

Poorer children's educational attainment: how important are attitudes and behaviour?

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This report considers some of the ways that affluence and disadvantage influence children's educational attainment. It focuses on a broad set of factors, varying across childhood, classified under the broad umbrella term 'aspirations, attitudes and behaviours'. The implications for policy are also explored.

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Children growing up in poorer families emerge from school with substantially lower levels of educational attainment. This is a major contributing factor to patterns of social mobility and poverty. This study – based on the analysis of several major large scale longitudinal data sets – suggests some potentially important influences, including:

- Early years: the richness of the early home learning environment.
- Primary school: maternal aspirations for higher education, how far parents and children believe their own actions can affect their lives, and children's behavioural problems.
- Secondary school: teenagers' and parents' expectations for higher education, access to material resources, and engagement in anti-social behaviour.
- Across childhood: parents' own cognitive abilities.

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Executive summary

Introduction

It is well known that children growing up in poor families emerge from our schools with substantially lower levels of educational attainment. Since educational qualifications are such a strong determinant of later-life income and opportunities, such achievement gaps create a major contributing factor to patterns of social mobility, which is of strong public concern. Political parties across the spectrum are committed to improving the life chances of children from all income backgrounds, and increasing opportunity for the children growing up in poorer families.

The routes through which affluence and disadvantage can influence educational attainment are potentially very broad indeed. In this report we focus on a range of factors that we classify under the broad umbrella term ‘aspirations, attitudes and behaviours’. These encompass a wide range of influences, varying across childhood, covering, for example, parenting styles during the very earliest stages of life, through to parental aspirations for educational success in the primary school years and teenage engagement in risky and positive behaviours during adolescence.

In order to study these factors, we are fortunate enough to be able to make use of new, large-scale and rich sources of data capturing groups of children growing up in the UK¹ today, namely the Millennium Cohort Study (MCS), the Avon Longitudinal Study of Parents and Children (ALSPAC), the Longitudinal Study of Young People in England (LSYPE) and the British Cohort Study (BCS). The children in these studies have been observed at various points in time from early childhood through to late adolescence.

Our findings suggest that the aspirations, attitudes and behaviours of parents and children potentially have an important part to play in explaining why poor children typically do worse at school. For example:

- Children from poor backgrounds are much less likely to experience a rich home learning environment than children from better-off backgrounds. At age 3, reading to the child and the wider home learning environment are very important for children’s educational development.
- The primary years show a lasting importance of the early home learning environment and the emergence of new important behavioural, attitudinal and belief variations by family background – maternal aspirations for higher education (HE) and children’s behavioural problems stand out as particularly important.
- While many of the negative educational trajectories experienced by young people from poor backgrounds appear to have already been set by early adolescence, expectations for HE, access to a computer and the internet, as well as teenagers’ experiences of bullying, antisocial behaviour and behavioural problems at school also seem to have a role to play.

But these variations only form one part of the picture: we also find that an important part of the story is about the transfer of cognitive abilities from one generation to the next.

Pre-school

There are big differences in cognitive development between children from rich and poor backgrounds at the age of 3, and this gap widens by the age of 5. Our companion working paper (Dearden *et al.*, 2010) has found similarly large gaps in young children’s social and emotional wellbeing at these ages.

Children from poor backgrounds also face much less advantageous ‘early childhood caring environments’ than children from better-off families.

For example, we have identified significant differences in poor children’s and their mothers’

health and wellbeing (e.g. birth weight, breastfeeding and maternal depression); family interactions (e.g. mother–child closeness); the home learning environment (e.g. reading regularly to the child); and parenting styles and rules (e.g. regular bedtimes and mealtimes), compared to children from better-off backgrounds.

Differences in the home learning environment, particularly at the age of 3, have an important role to play in explaining *why* children from poorer backgrounds have lower test scores than children from better-off families. However, a much bigger proportion of the gap remains unexplained, or appears directly related to other aspects of family background (such as the mother’s age, and family size) that are not mediated through the early childhood caring environment.

This suggests that policies to improve parenting skills and home learning environments in isolation cannot possibly eliminate the cognitive skills gap between rich and poor young children. On the other hand, our findings in our companion working paper (Dearden *et al.*, 2010) suggest that the many aspects of the early childhood caring environment have a positive effect on children’s social and emotional development, such that policies aimed at improving health, parenting skills and the home learning environment could have further short- and long-term pay-offs.

Primary school

The gap in attainment between the poorest children and children from better-off backgrounds, already large at age 5, grows particularly fast during the primary school years. By age 11, only around three quarters of children from the poorest fifth of families reach the government’s expected level at Key Stage 2, compared to 97% of children from the richest fifth.

Poor children who perform well in Key Stage tests at age 7 are more likely than rich children to fall behind by age 11, and poor children who perform badly at age 7 are less likely to improve their ranking compared to children from better-off backgrounds, which is an important factor behind the widening gap.

Parental aspirations and attitudes to education vary strongly by socio-economic position (SEP),

with 81% of the richest mothers saying they hope their 9-year-old will go to university, compared with only 37% of the poorest mothers. Such adverse attitudes to education of disadvantaged mothers are one of the single most important factors associated with lower educational attainment at age 11. This factor alone is associated with 6% of the attainment total gap between the richest and poorest children at age 11, even after accounting for differences in prior ability.

Children’s attitudes and behaviours in primary school also vary in the degree to which they are socially graded. Poor children tend to view themselves as scholastically less able, are less likely to believe that school results are important in life, and exhibit higher levels of hyperactivity, conduct problems and peer problems. However, their levels of school enjoyment and cooperative behaviour differ little from those of more affluent children.

The greater behavioural problems of disadvantaged children are another key factor in accounting for their poorer educational outcomes. We find evidence that children with high levels of antisocial behaviours, hyperactivity and conduct problems at the ages of 8 to 9 scored lower at Key Stage 1, but even taking this into account, such behaviours appear to interfere with the learning process between ages 7 and 11.

Other factors we identify as important are the extent to which individuals (both mothers and children) believe that they can control events that affect them (captured by their locus of control), and the view that school results are not important in life.

Overall, we find that differences in attitudes and behaviours during primary school account for around 12% of the total age 11 attainment gap between the poorest and richest children (and 40% when prior ability is not controlled for). This amounts to around one third of the differential progress that is made between rich and poor children between the ages of 7 and 11, and suggests that government policies that aim to change mothers’ and children’s attitudes and behaviours during primary schooling could be effective in reducing the growth in the rich–poor gap that takes place over this time.

Secondary school

While the gap between the poorest children and children from better-off backgrounds grows less quickly across secondary school than primary, by the time young people take their General Certificates of Secondary Education (GCSEs), the gap between rich and poor is very large. For example, only 21% of the poorest fifth (measured by parental socioeconomic position; SEP) manage to gain five good GCSEs (grades A*–C, including English and maths), compared to 75% of the top quintile – an astonishing gap of 54 percentage points.

Decisions, investments and attitudes and behaviours made earlier in young people's lives appear to be the main drivers of differences in educational outcomes during the teenage years. Attainment gaps at age 11 are already large and the further widening is relatively small in the teenage years compared to earlier in childhood.

However, the attitudes and behaviours of teenagers and those of their parents do contribute to the attainment gap in GCSE results. For example, even after controlling for long-run family background factors and prior attainment we find that young people are more likely to do well at their GCSEs if their parents think it likely that the young person will go on to higher education (HE), spend time sharing family meals and outings, quarrel with their child relatively infrequently, and devote material resources towards education including private tuition, and computer and internet access.

We also find that young people are more likely to do well at their GCSEs if they have a greater belief in their own ability at school, believe that events result primarily from their own behaviour and actions, find school worthwhile, think that it is likely that they will apply to, and get into, HE, avoid risky behaviours such as frequent smoking, cannabis use, antisocial behaviour, truancy, suspension and exclusion, and do not experience bullying.

Since young people growing up in poor families do less well in *all* these respects compared to young people growing up in better-off families, this provides some explanation for their poorer educational attainment by the end of post-compulsory schooling. Overall, these factors contribute just under a quarter of the education

gaps at age 16, and for a large part of the small increase in the gap between ages 11 and 16.

It is interesting to note that expectations for HE among parents and children are *high* across the board, especially at age 14. At this age, far more parents and children think that they are likely to go on to HE than eventually will go. However, there is a 'collapse' in expectations regarding university between the ages of 14 and 16, particularly among children from the poorest backgrounds.

While the emphasis on intervening earlier is clear, policies aimed at improving attitudes and behaviours among teenagers could have some beneficial effects in preventing children from poor backgrounds falling yet further behind during the secondary school years.

An intergenerational picture

Children's test scores are lowest when poverty has persisted across the generations, and highest when material advantage has been longlasting.

Parents' cognitive abilities and other childhood circumstances play a very important role in explaining the gap between the test scores of rich and poor children today.

Nearly one fifth of the gap in test scores between the richest and poorest children is explained by an apparent 'direct' link between the childhood cognitive ability of parents and that of their children. This is the contribution that we find even after controlling for a wide range of environmental factors, and after taking into account many of the channels through which cognitive ability might operate, such as parents' subsequent educational attainment, adult SEP, attitudes to education, and so on.

On the other hand, while good social skills also appear to be linked across generations, these do not make a significant direct contribution to the gap in cognitive test scores between rich and poor children today.

There is also a strong intergenerational correlation between a wide variety of other attitudes and behaviours. For example, the probability that a parent reads to their child daily is 25% higher if they themselves were read to daily as a young child; the likelihood that the cohort member thinks that their child is very or fairly likely to go to university is 15%

higher if their own parents expected them (at age 10) to continue in education beyond age 16. The passing of these traits across generations helps to explain the persistent disadvantage that children from poor backgrounds face in their educational attainment.

We can also learn something about the influences on cognitive attainment by looking at differences between siblings within the same household. For example, it is interesting that siblings whose parents think they are very or fairly likely to go to university tend to have higher test scores than siblings whose parents do not expect them to go to university. Of course, as with all our analysis, one needs to be careful in assuming a particular direction of causation here, since parents are likely to respond to differences in their children's ability when forming their expectations.

Policy conclusions

Our findings suggest that attitudes and behaviours are potentially important transmission mechanisms between socioeconomic disadvantage and children's educational attainment. They also play a similar potential role in the transmission between parental education and children's educational outcomes.

However, drawing policy conclusions from this evidence must be done with care, because while our analysis is based on rich data, it is not derived through robust trials, which are needed to prove that (a) these domains can be changed and (b) such change would indeed improve poor children's outcomes in the way that is hoped. This requires robust intervention studies.

The evidence presented in this report offers three major areas in which policy may make a contribution to reducing educational inequalities:

1. parents and the family home
 - a) improving the home learning environment in poorer families (e.g. books and reading pre-school, computers in teenage years);
 - b) helping parents from poorer families to believe that their own actions and efforts can lead to higher educational outcomes;

- c) raising families' aspirations and desire for advanced education – from primary schooling onwards;
2. the child's own attitudes and behaviours, and their approach in taking forward their past experiences into learning
 - a) reducing children's behavioural problems; improving coping and management capabilities for risky behaviours, conduct disorder and attention deficit hyperactivity disorder (ADHD);
 - b) helping children from poorer families to believe that their own actions and efforts can lead to higher educational outcomes;
 - c) raising children's aspirations and desire for advanced education – from primary schooling onwards;
3. the school's approach
 - a) schools could arguably be doing more to reduce inequalities in attainment between rich and poor, and potentially have a very significant role to play in counteracting the effects of the big inequalities in family backgrounds and home environments that our study has revealed. Relevant policies are likely to include:
 - how funds are allocated towards pupils from the poorest backgrounds;
 - direct teaching support provided to children when they start to fall behind.

Our reading of government policy is that there has been a marked shift in policy emphasis in recent years away from a narrower focus on educational outcomes, and towards the wider emotional and social wellbeing of children. However, some of the bases highlighted above appear better covered by existing policy, and policy evidence, than others. For example:

- There is considerable emphasis on parenting programmes and improving child behaviours in the early years before schooling starts, but much less so in the primary school years (and even less in secondary), although our research suggests that reaching families while children are of school age might continue to be useful.
- Intensive programmes that focus on helping small numbers of children most in need tend to have the strongest evidence base behind them. However, educational disadvantage affects a very large number of children from low-income families, but with lower intensity than those at the extreme, and it may be that policy needs to focus more on these.
- Programmes to raise educational aspirations (such as Aim Higher) typically start in the secondary school years, while our research offers the possibility that such interventions would be worthwhile at a younger age – for example in primary schools.
- The evidence base that we have on school- and local-based interventions designed to improve young people’s social and emotional skills, behaviour and participation in positive activities is generally much weaker than our evidence on parent- and home-based interventions in the early years, and this evidence base needs to be strengthened. In particular, there is very little evidence on whether these eventually lead to improved attainment at school.

If successful, then changes in the areas we have highlighted in this report might at the least help to prevent children from poor backgrounds from slipping further behind their better-off peers throughout their schooling careers, and indeed could go some of the way towards closing the rich–poor gap.

1 Introduction

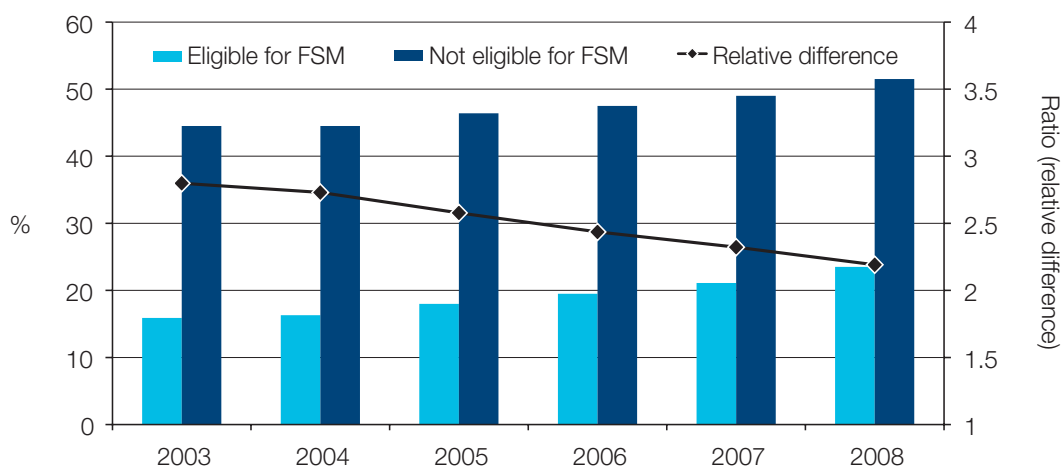
It is well known that children growing up in poor families emerge from our schools with substantially lower levels of educational attainment. From the government's own statistics, we know that in 2008, less than a quarter of children from the poorest families (eligible for free school meals; FSM) obtained five or more good GCSEs (at A*–C) inclusive of English and maths. This compares with just over a half of their richer peers, not eligible for FSM. As Figure 1.1 also shows, the proportion of both groups achieving this benchmark has risen in recent years. This growth has been slightly faster among the FSM-eligible group than among those not eligible, such that the relative gap between these groups has fallen over this period (as indicated by the black line). While achievement gaps by family income have started to close over the last decade (Gregg and Macmillan, 2009), these gaps remain large and since educational qualifications are such a strong determinant of later life income and opportunities, such achievement gaps create a major obstacle to social mobility, which is of strong public concern.

Political parties across the spectrum are committed to improving the life chances of children from all income backgrounds, and increasing social mobility. In the 2007 Children's Plan,²

the government states that 'we need to see faster rises in standards and to close the gaps in achievement that exist for disadvantaged and vulnerable children'. In its plan for school reform,³ the Conservative Party states that 'Schools should exist to reverse inequality, to advance social mobility, to give individuals of talent, whatever their background, the chance to shine. But that isn't happening under the current system'. The Liberal Democrats begin their recent education policy paper⁴ by saying that 'Liberal Democrats believe in freedom. A free society is one in which no person is "enslaved by poverty, ignorance or conformity" (Federal Constitution). Education can change lives: education helps make us free and is a key engine of social mobility'.

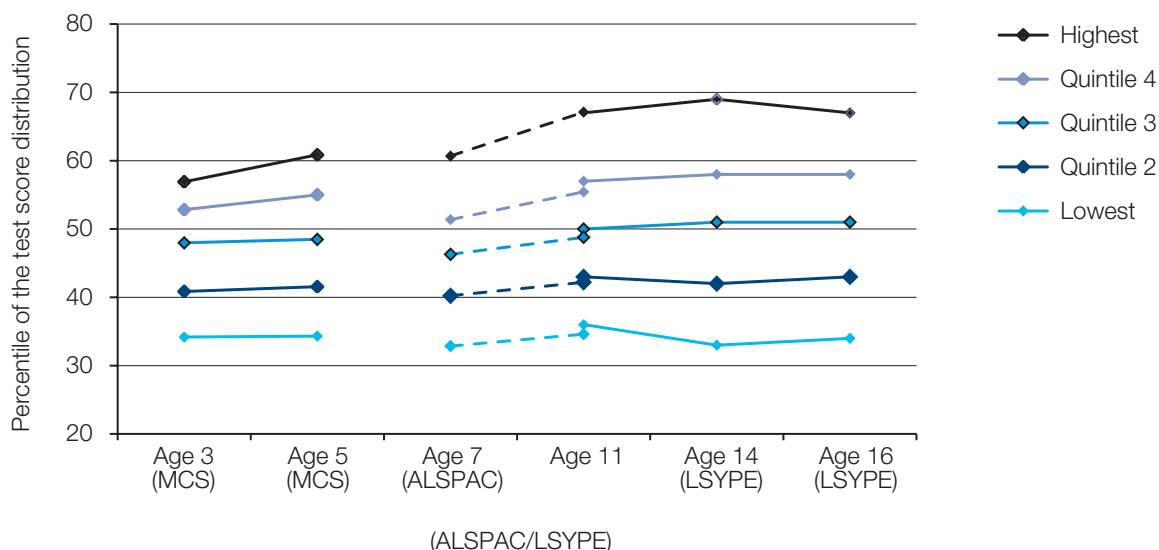
Figure 1.2 (drawn from three current cohorts) shows that educational deficits emerge early in children's lives, even before entry into school, and widen throughout childhood. Even by the age of 3 there is a considerable gap in cognitive test scores between children in the poorest fifth of the population compared to those from better-off backgrounds, and this gap gets wider as children enter and move through the schooling system, especially in the primary school years.

Figure 1.1: Percentage of children achieving 5+ GCSEs at grades A*–C (including English and maths) by FSM eligibility, 2003–08



Source: DCSF (2009a) (for years 2003–07); DSCF (2009b) (for year 2008)

Figure 1.2: Educational outcomes by SEP quintile, across surveys and ages



Notes: We use our data to divide the population of children into fifths, ranked according to a constructed measure of socioeconomic position, which is based on their parents' income, social class, housing tenure and a self-reported measure of financial difficulties. We then chart the average cognitive test scores of these children from the ages of 3 through to 16.

The dotted lines in the middle segment of Figure 1.2, covering ages 7 to 11, reflect that this sample is derived from ALSPAC data, which is a sample of children from the Avon area, rather than a national sample, and as such are not directly comparable to the other datasets used.

Policy-makers have long struggled to understand precisely what the sources of these educational inequalities are, and in turn to find policies that will reduce them. Our own work seeks to inform this policy debate: we track how educational inequalities change from early childhood through to adolescence, and examine the routes through which families' economic position affects children's educational attainment. The routes through which affluence and disadvantage can influence educational attainment are potentially very broad indeed. In this report we focus on a range of factors that we classify under the broad umbrella term 'aspirations, attitudes and behaviours' – these encompass a wide range of influences, varying across childhood. The diverse set of influences we examine range, for example, from parenting styles during the very earliest stages of life, through to parental aspirations for educational success in the primary school years, and teenage engagement in risky and positive behaviours during adolescence. These 'aspirations, attitudes and behaviours' are highlighted in a conceptual model that underlines our work, set out in Figure 2.2.

In order to study these factors, we are fortunate enough to be able to make use of new and rich

sources of data capturing groups of children growing up in the UK⁵ today. These children have been observed at various points in time from early childhood through to late adolescence (these datasets are described in Box 2.1 and Figure 2.1). These new sources of data allow us to take a very broad view of the routes through which SEP affects educational attainment, and which factors explain the strong socioeconomic gradients observed in education outcomes.

Our findings suggest that while the attitudes and behaviours of parents and children have an important part to play in explaining why poor children typically do worse at school, this only forms one part of the picture. We also find that an important part of the story is about the passing on of cognitive abilities from one generation to the next. Delving into more detail, we are able to form a narrative about the important influences on educational attainment at different ages. For example:

- At age 3, reading to the child and the wider home learning environment are very important for the child's educational development.

- The primary years show a lasting importance of the early home learning environment and the emergence of important behavioural, attitudinal and belief variations by family background.
- By the early teenage years, while many of the negative educational trajectories experienced by young people from poor backgrounds appear to have already been set, parental and child expectations and aspirations for both age 16 destinations and HE, as well as teenagers' experiences of bullying, antisocial behaviour, and behavioural problems at school are also important.
- Finally, our work looking at intergenerational transmissions confirms the importance of all the mechanisms highlighted above, but also shows that many of these are passed on across generations, and also reveals the importance of the transmission of cognitive ability from parents to their children.

The remainder of this report is as follows.

Chapter 2 sets out a simple modelling framework underlying each of our analyses, and describes in some more detail the data sources used. Chapter 3 summarises our findings from the pre- and early-schooling years, based on the MCS. Chapter 4 summarises our work covering the primary school years, based on the ALSPAC. Chapter 5 summarises our findings from the secondary school years, based on the LSYPE. Chapter 6 sets out our work on intergenerational transmissions, based on the children of the BCS.⁶ Chapter 7 discusses the policy context for these findings, and concludes.

2 Models and data

All of our work is based on a very simple model linking an indicator of potential financial (dis)advantage, namely parental SEP, to educational outcomes measured from age 3 to age 16 (see Figure 2.1). In this simple model, the main item of interest is to establish the importance of a number of parental and child attitudes and behaviours that may serve as ‘transmission mechanisms’ between material wellbeing and other measures of family background, and educational outcomes. These vary considerably according to the age of the child, and are summarised in Figure 2.1.

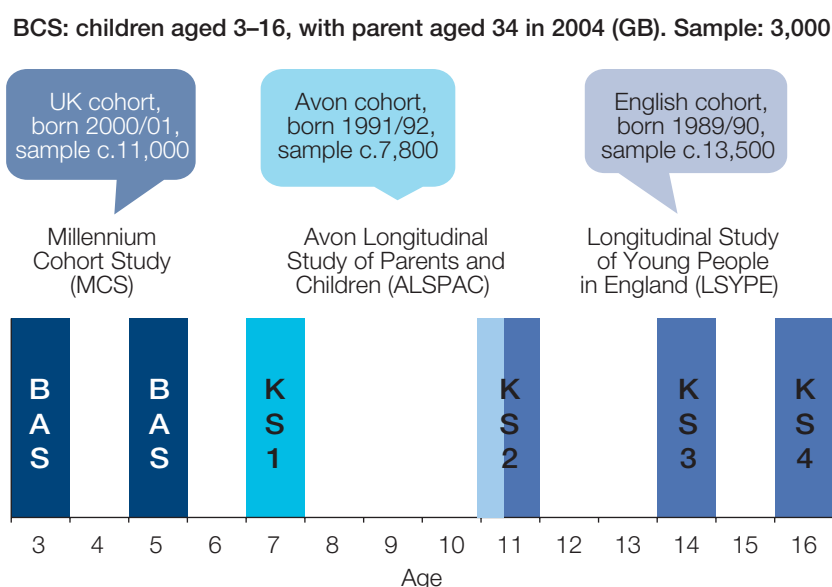
We are fortunate to have a number of new datasets at our disposal, which allow us to carefully chart the statistical associations between a wide range of family background variables, and parent and child attitudes and behaviours, which serve as plausible transmission mechanisms between child poverty and poor educational attainment (see Box 2.1 and Figure 2.2).

Although the nature of the information observed about parents and children in the different surveys we use varies, we have adopted as common an approach as possible to the measurement of key concepts – such as education outcomes, SEP (see Box 2.2) and transmission mechanisms – in order to provide a unified analysis across the different strands of work. In this report we highlight the most non-technical aspects of our work, while in our companion working papers we present more technical analyses.⁷

Our analysis answers the following questions about children at each life stage in turn:

1. How do the education outcomes of children from poor backgrounds compare with those from the middle and the top, and how do these inequalities change as children age?

Figure 2.1: Summary of data sources, and test scores used for analysis



Notes: BAS: British Ability Scales. For MCS analysis we use BAS vocabulary only since this is the only measure available at both waves, whereas for the BCS we use all elements. KS: Key Stage national tests, applying to state school children only. (Private school children are not included in our samples.)

Box 2.1 Data sources used for this study

Children from birth to age 5:

Millennium Cohort Study (MCS)

The MCS began as a longitudinal study of approximately 18,000 children born in the UK in 2000. The first sweep of the study was conducted when MCS children were about 9 months old. This over-sampled individuals from minority ethnic groups and individuals living in disadvantaged areas of the country. Two further sweeps of data, which were collected when the children were aged about 36 months (sweep 2) and when they were aged about 5 years old (sweep 3), have been used for this report. Further sweeps of data will be collected at future key milestone ages (e.g. data collection has now been completed for the age 7 sweep, and a further sweep is planned at age 11). More information about the MCS can be found at www.cls.ioe.ac.uk/. For our analysis, we chose to sample those who responded to all three surveys and those where the mother was the main respondent. We also excluded individuals who had missing data for some key characteristics, such as education, measures of the home learning environment and ethnicity. This left us with approximately 11,100 observations.

From birth through primary school: Avon Longitudinal Study of Parents and Children (ALSPAC)

The ALSPAC is a cohort study that recruited around 14,000 pregnant women who were resident in the Avon area of England and whose expected date of delivery fell between 1 April 1991 and 31 December 1992. Study families were surveyed via high-frequency postal questionnaires from the time of pregnancy onwards, and via a number of hands-on clinics in which ALSPAC staff administered a range of detailed physical, psychometric and psychological tests to the children. The ALSPAC has been linked to the National Pupil Database (NPD),

which contains school identifiers and results on national Key Stage school tests for all children in the public school system. For information on the ALSPAC, see www.bris.ac.uk/. The data requirement for our analysis is such that families must have remained in the study from birth to 9 years. This is quite a stringent requirement and there is substantial attrition, leaving us with a working sample of only 7,764, about half of the original cohort. We have used a number of techniques to ensure that our definitions of SEP, and the scaling of the Key Stage outcome variables, are as representative as possible of the national population, rather than only those who remain in the sample. (Further details can be found in our companion working paper, Gregg and Washbrook, 2009.)

The secondary school years: Longitudinal Study of Young People in England (LSYPE)

The LSYPE (known as 'Next Steps' to its participants) is a study of more than 15,000 young people in England who were aged 13 and 14 (Year 9) in 2003/04, and hence born in 1989/90. The survey contains boosted samples from minority ethnic groups and schools with high deprivation scores. So far there have been five waves of the LSYPE collected, on an annual basis, and it is envisaged that the study will eventually contain 10 waves, following these individuals into their early twenties. Academic results at Key Stages 2 (age 11), 3 (age 14) and 4 (age 16) and personal characteristics from the NPD have been matched to the survey for all children at state schools who had such records. For more information on the LSYPE, see www.esds.ac.uk/. Our work thus far is based on waves 1 to 3 of the data (ages 14–16). Our working estimation sample contains 13,343 children (for whom we have full Key Stage 2, Key Stage 3 and Key Stage 4 results). This sample selection implies,

Box 2.1 continued

among other things, that we keep only state school children in our sample.

Intergenerational transmission: the children of the British Cohort Study (BCS70)

The BCS70 is a cohort study, which aimed to recruit all children born in Great Britain in a particular week in April 1970. There have been six subsequent follow-ups (at ages 5, 10, 16, 26, 29 and 34), with information collected on a wide range of socioeconomic and other family background factors, attitudes and behaviours of parents and children, cognitive and non-cognitive test scores, educational attainment and subsequent labour market outcomes through a mixture of face-to-face, telephone and postal surveys. More information on the BCS70 can be found at www.cls.ioe.ac.uk/. As part of the age 34 follow-up (in 2004), information on all natural and adopted children living with BCS70 cohort members was collected for a one-in-two sample of the cohort, including detailed information on cognitive and non-cognitive skills, and the attitudes and behaviours of cohort members and their children. We focus our analysis on surveyed parents and their children in the age 34 follow-up, and further restrict attention to children between the ages of 3 and 16 for whom we observe cognitive test scores. This gives us a sample of 3,416 children in total (born to 2,059 cohort members). The average age of the children in our analysis is just over 7 years old, with a little over a third of the sample aged 3–5, around 40% aged 6–9 and around a quarter aged 10–16.

Our companion working papers set out further information about the implications of the sample selections we have made for each study (Gregg and Washbrook, 2009; Chowdry *et al.*, 2010; Dearden *et al.*, 2010).

2. What are the differences in the attitudes and behaviours of children from different income backgrounds?
3. How much could differences in attitudes and behaviours explain the education gap between poor children, and children from better-off backgrounds? What else explains this gap?
4. What are the policy implications of these findings?

For our work looking at the children of the BCS, we ask the following additional questions:

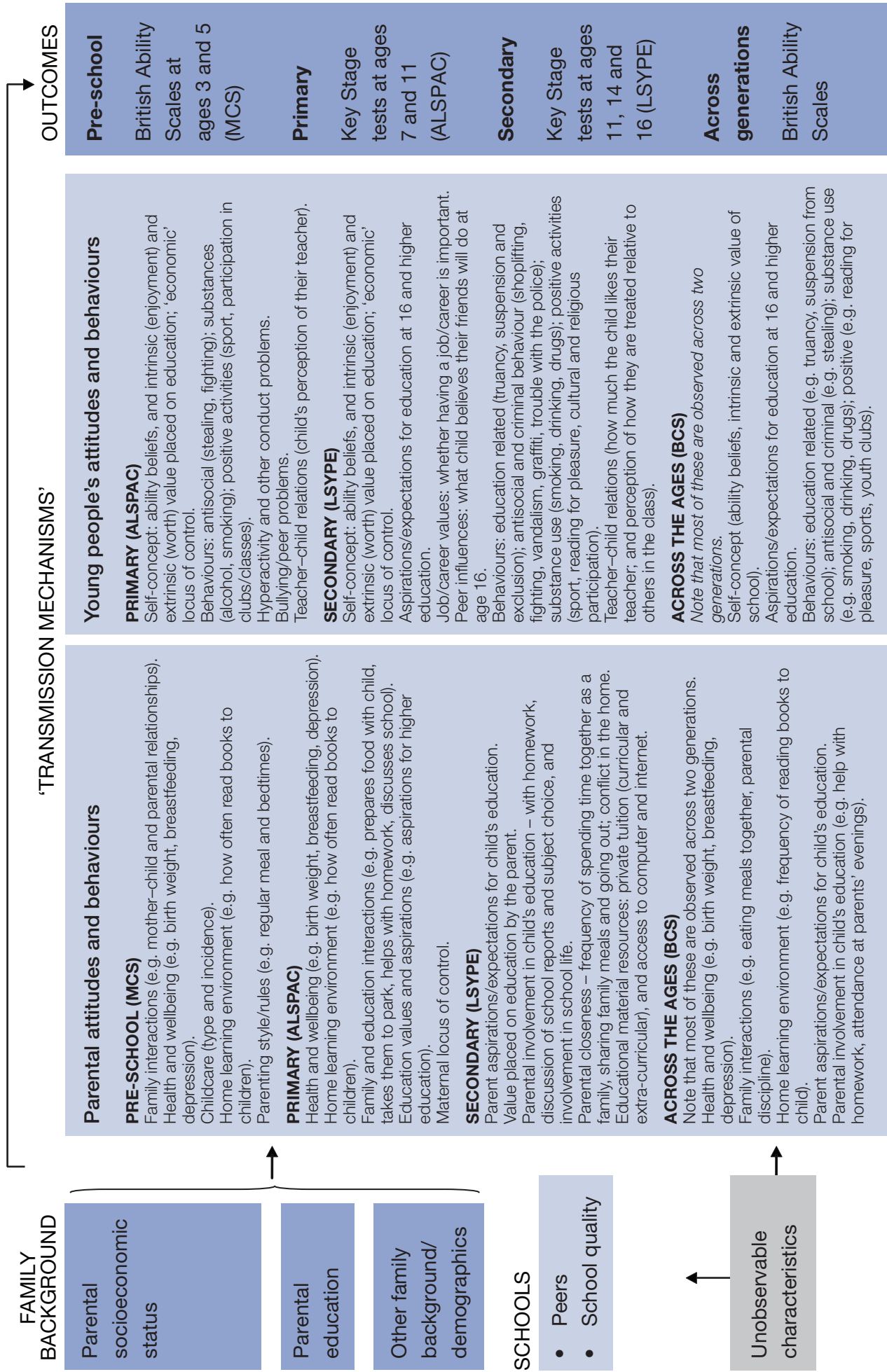
5. To what extent are these attitudes and behaviours passed on across generations?
6. How important is this intergenerational transmission for explaining differences in educational outcomes among the younger generation?

Many of these questions can be answered using simple graphics, and descriptive statistics. We also use a number of simple multivariate regression models to help derive our explanations.

It must be noted that our work – along with most other work in this area – cannot robustly establish the presence of direct causal links between these factors. This is because:

- There may be *unobserved factors* (also marked on Figure 2.1) causing young people from poorer families to have both ‘worse’ attitudes and behaviours of different kinds, and worse educational outcomes. For example, there may be genetic factors such as innate intelligence that link parental educational attainment with that of their children; however, our models cannot take innate intelligence into account.
- The *direction of causation* may run the other way round, such that a child’s educational development might influence their own attitudes and behaviours, or those of their parents. For example, a mother might spend more time

Figure 2.2: A simple model linking parental SEP and child outcomes



Box 2.2 Measuring SEP

For each of our project strands we have constructed an index of SEP that is designed to be as common as possible across strands. The measure aims to capture the longer-term material resources of the household, and is constructed from the following variables:

- log equivalised household income (averaged across as many points in time as possible, depending on the survey used);
- reported experience of financial difficulties;
- mother's and father's occupational class;
- housing tenure.

The measure is constructed using principal-components analysis, and individuals are then placed into quintiles (fifths) of the population ranked by this measure.

In some of our analyses, we also consider mother's education as an alternative indicator of SEP.

reading to her child if that child shows a strong aptitude for learning; however, our models cannot take this 'simultaneity' into account.

Since we cannot make causal claims for our analysis, it will be important to place our results within the context of a wide literature on the effectiveness of a range of related policies, which we do in our concluding chapter (Chapter 7).

3 From birth to age 5: evidence from the Millennium Cohort Study

Lorraine Dearden (IoE and IFS), Luke Sibieta (IFS) and Kathy Sylva (Oxford)

Already at the age of 3, there are big differences in cognitive, and social and emotional development between children growing up in poor families, and those from better-off backgrounds. This gap grows even wider by the age of 5. In this chapter we examine the role played by a wide range of factors that we collectively refer to as the ‘early childhood caring environment’ in explaining this gap. The influences that are considered within this banner are a diverse set, including family interactions (such as mother–child relationship problems), health and wellbeing (including birth weight, breastfeeding and maternal post-natal depression); childcare usage; the home learning environment (including reading to the child); and parenting style/rules (including regular bedtimes).

We find that children from poor families typically face much less advantageous early childhood caring environments at both age 3 and age 5, compared with young children from better-off backgrounds. For example, poor children tend to experience a much poorer home learning environment (e.g. their parents read to them less often), and less regularity in their bedtime and mealtime routines. They typically show a greater number of conduct problems compared with children from better-off backgrounds, while mothers and children in the poorest fifth of the population are less likely to display closeness in the context of the survey interview (e.g. poorer mothers are less likely to spontaneously praise the child). Poorer mothers are less likely to breastfeed and are more likely to suffer from post-natal depression than mothers from better-off backgrounds.

As big as these differences in the early childhood caring environment are, we find that collectively they explain around *one quarter* of the

cognitive gap between the poorest and richest children at the age of 3 – with differences in the home learning environment playing the biggest role among these. Differences in family background factors, such as mother’s age, parental education and family size together explain a much bigger proportion of the gap in cognitive outcomes between rich and poor at age 3. While it is obvious that family background factors such as these must have their effect on cognitive outcomes through some mechanism, our analysis suggests that this mechanism is *not* primarily the early caring environment as captured in our study. Indeed, the largest proportion of the gap in cognitive outcomes between rich and poor – around a third of the total gap – remains unexplained by any of the observable characteristics in the MCS data. Chapter Six, which is based on the BCS, suggests that at least part of this unexplained element is linked to the transmission of cognitive ability across generations.

By the age of 5, we find that the gap between the poorest fifth of children and children from better-off backgrounds has grown. But, in general, differences in the early childhood caring environment as measured by our study do not seem to play much of a role in explaining why this gap has grown. One exception is differences in the home learning environment particularly at the age of 3. Our findings suggest that policies aimed at narrowing the gap between rich and poor children at the age of 5 will be more effective if they focus attention on the home learning environment provided to children at age 3, rather than at age 5.

In summary, it seems that even by the age of 3, while we can identify several aspects of the early childhood caring environment that appear to

contribute to the gap between poor children and children from better-off backgrounds, it is factors that are either unobserved, or in some sense predetermined or very hard to change, that explain the largest element of the socioeconomic divides in cognitive outcomes. By age 5, the importance of such factors is even larger. With a view to closing socioeconomic gaps in cognitive outcomes, these results underline the fact that policies that aim to improve the early childhood caring environment can go some way to closing, but cannot fully close, these gaps. This finding chimes with our work looking at the intergenerational transmission of traits and attributes (see Chapter 6), which emphasises the importance of the strong intergenerational link between parents' and children's cognitive abilities, and the longlasting impact of circumstances in the parents' own childhoods in explaining these gaps between rich and poor.

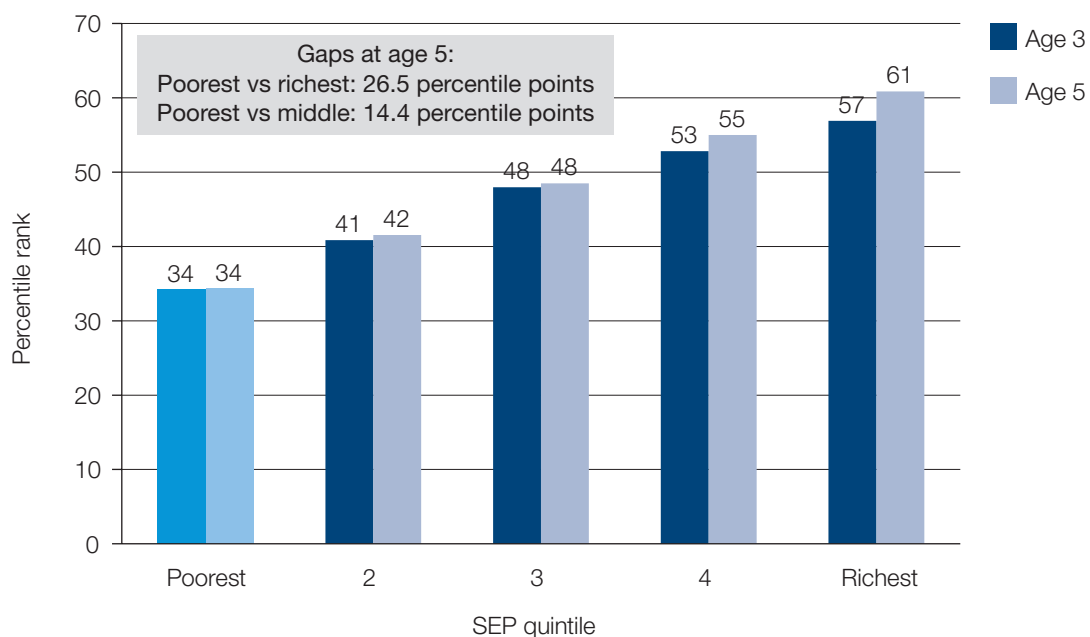
By contrast, when considering the reasons for 'deficits' in social and emotional outcomes among young children growing up in poverty,⁸ we find a larger role played by differences in measures of the early childhood caring environment. More specifically we find a bigger explanatory role

for differences in family interactions, health and wellbeing factors, the home learning environment and parenting styles and rules.

What are the cognitive outcomes of children from poor backgrounds at ages 3 and 5?

Already by the age of 3 there are big differences in the cognitive outcomes of poor children compared to those from better-off backgrounds, and this gap widens by the age of 5 – as children from the richest backgrounds in particular continue to improve their performance relative to other children. Figure 3.1 shows the average percentile rank in the vocabulary element of the British Ability Scales (BAS) by quintile of parental SEP. Young children from the poorest fifth of families are ranked on average at around the 34th percentile at the age of 3. This is around 23 percentage points lower than the average rank among the richest fifth of children. This rich–poor gap has risen to nearly 27 percentile points by the time the children have reached the age of 5. Figure 3.1 shows that the middle–poor gap is also large.⁹

Figure 3.1: Child cognitive outcomes at ages 3 and 5, by SEP quintile



Note: The cognitive outcomes used at both ages are the BAS Naming Vocabulary, which are both expressed as percentiles of age-normalised scores. Due to discontinuities in the age-normalised score, the average percentile is not 50.5 in either case.

How can the magnitude of these gaps be understood on a more intuitive level? Other research analysing these outcomes in the MCS has shown that children at age 5 living in poverty are the equivalent of 8 months behind their peers (or 13 months behind when one looks at the least and most educated parents) (Jones and Schoon, 2008). (However, the authors also note that such estimates are approximations and that caution should be exercised in interpreting them.)

It is interesting to note that there are equally large gaps at ages 3 and 5 in terms of social and emotional development (shown in our companion working paper; Dearden *et al.*, 2010).

How do the early childhood caring environments of children from rich and poor backgrounds compare at ages 3 and 5?

Young children from poor families also experience very big differences in the early childhood caring environments to which they are exposed from the moment they are born (and indeed before). Here we document some of these differences, which are also shown graphically in Figure 3.2.

- **Family health and wellbeing:** Children from poor backgrounds typically have lower birth weights than children from better-off backgrounds (while the average gap is just a few hundred grams, even such seemingly small differences in birth weight are strongly associated with a range of important later life outcomes). Babies from poor backgrounds are much less likely to ever have been breastfed (about 50% of the poorest babies, compared to almost 90% of the richest), while their mothers are much more likely to suffer from depression when their baby was 9 months old (22% among the poorest fifth compared to 7% among the richest fifth).
- **Family interactions:** Children from poor families typically show a greater number of conduct problems by the age of 3: for example, being spiteful towards other children. They also score significantly lower on measures of mother–child closeness (as graded by the

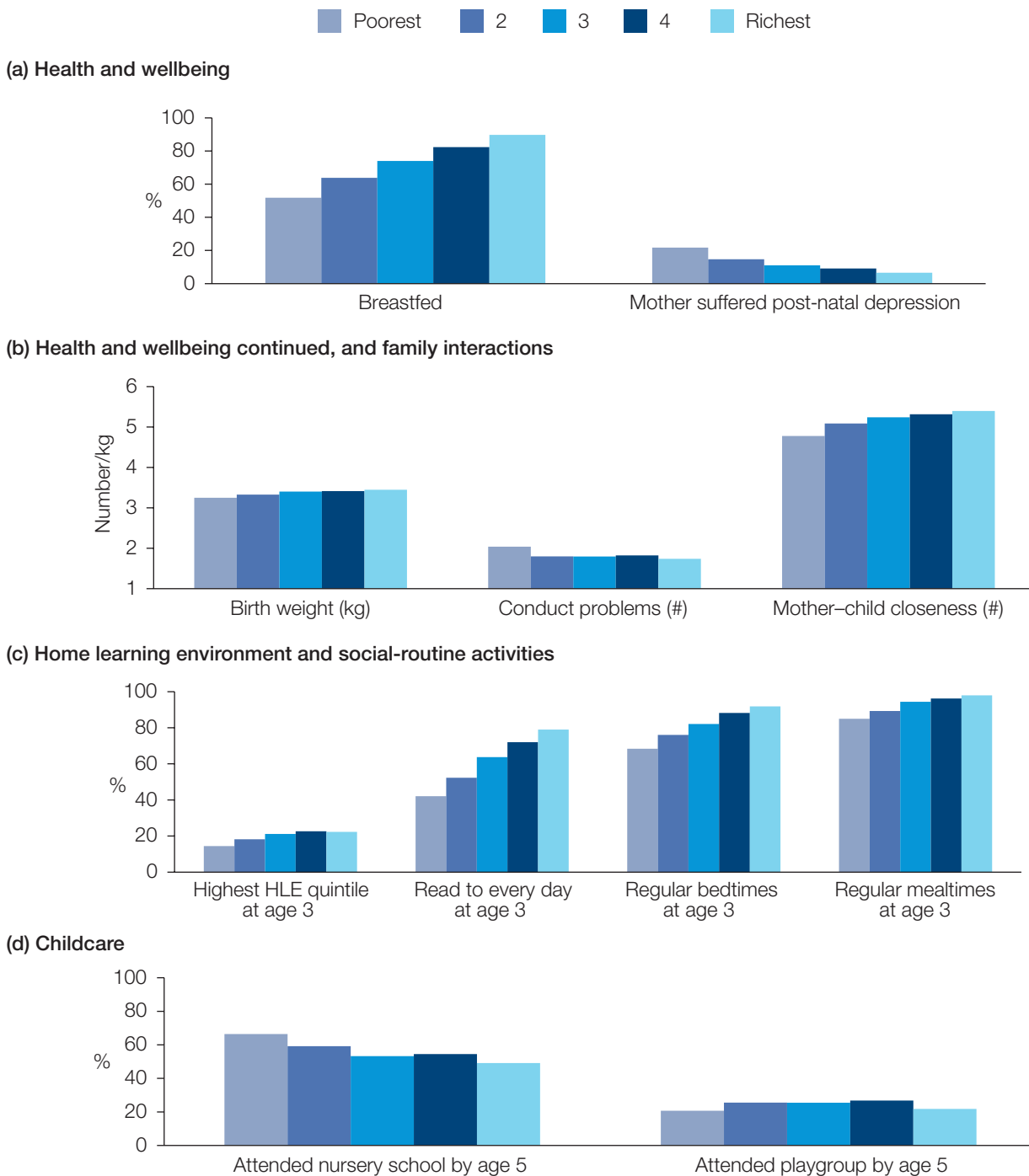
survey interviewer, based on observations such as whether the mother spontaneously praised the child).

- **Home learning environment:** Poorer children are significantly less likely to have a rich home learning environment (as captured by having an ‘HLE score’ in the top fifth), and are less likely to be read to every day (42%) than children from the richest families (79%). See Box 3.1 for more details of what is included in our measure of the home learning environment.
- **Parental style and rules:** Children from poor backgrounds typically experience less regularity in their routines compared to young children from better-off backgrounds. At the age of 3, for example, they are less likely to have regular bedtimes or regular mealtimes.
- **Childcare:** Differences in participation in formal childcare between children from different socioeconomic backgrounds are less clear cut than the other differences in the early childhood caring environment that we have already shown. However, poorer children are more likely to have attended a nursery school by the age of 5, but slightly less likely to have attended a play group.

Underlying these differences in the early childhood caring environment, we also observe considerable differences in family backgrounds between children from poor families and those from richer families. Some of these differences are charted in Figure 3.3. For example, at the age of 3:

- **Maternal education:** Over a third of the poorest mothers have no formal educational qualifications, while only around 6% of mothers in the middle fifth and less than 1% of children in the richest fifth are similarly unqualified.
- **Minority ethnic groups:** Children from the poorest families are also more likely to come from a minority ethnic group: 16% of children from the poorest fifth are from a minority ethnic group, as opposed to 6% of children from the richest fifth. Dearden and Sibieta (2010) further investigate ethnic differences in the other

Figure 3.2: Differences in the early childhood caring environment, by SEP quintile



factors mentioned in this chapter. For example, they show that minority ethnic children tend to come from larger families, are more likely to be breastfed, typically have poorer home learning environments and are less likely to have regular bedtimes.

- Lone parenthood:** More than 40% of children in the poorest quintile are in a lone-parent family at the age of 3, compared to less than 2% of children in the richest fifth.

- Mother's age and family size:** Children in the poorest fifth typically have relatively young mothers, and are born into families with more brothers and sisters, compared to children from better-off backgrounds.

In the Appendix we provide further context by showing which of these factors are positively or negatively associated with young children's test scores at ages 3 and 5, from a simple multivariate regression model.

Can differences in the early childhood caring environment explain the cognitive gap between poor children and children from better-off backgrounds?

In this section we ask how important these differences in the early childhood caring environment are for explaining why young children from poor backgrounds show slower cognitive development by the ages of 3 and 5 than children from better-off backgrounds.

To address this question, we use a simple 'decomposition' analysis. We decompose the 23 percentile point gap in test scores between children from the poorest and richest families at age 3 (as represented by our SEP quintiles) into the contribution made by each group of characteristics

included in our model. This is then repeated for cognitive outcomes at age 5. The relative contribution of each characteristic is calculated by multiplying the difference in the proportions of rich and poor children with that characteristic by the coefficient estimates from a regression model of cognitive outcomes, which includes all explanatory characteristics simultaneously.¹⁰

Our decomposition of the rich–poor gap at age 3 is shown in Figure 3.4. The factors relating to the early childhood caring environment are highlighted in blue. It suggests the following:

- Differences in the **early childhood caring environment** collectively can explain around *one quarter* of the cognitive gap between the poorest and richest children at the age of 3, suggesting that these are some of the *channels*

Box 3.1 How do we measure the home learning environment in the MCS?

The index we use to measure the home learning environment at ages 3 and 5 is based on the following sets of questions from the MCS. Many of the items are similar to those used as part of the Effective Pre-school and Primary Education (EPPE) project run by the Department for Children, Schools and Families (DCSF); see Sylva *et al.* (2008) for more details.

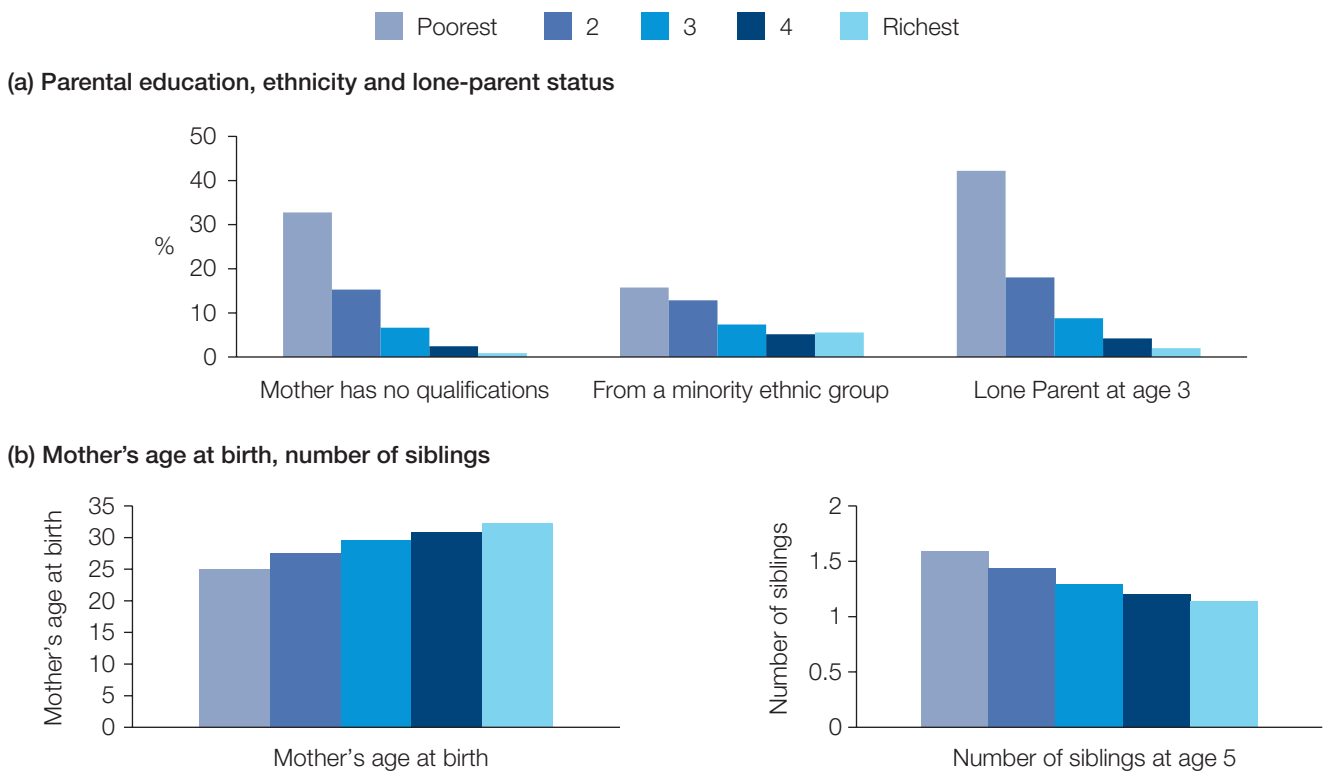
Age 3

- How often do you read to your child?
- How often do you take your child to the library?
- How often do you help your child to learn the ABCs or the alphabet?
- How often do you teach your child numbers or counting?
- How often do you teach your child songs, poems or nursery rhymes?
- How often does your child paint or draw at home?

Age 5

- How often do you read to your child?
- How often do you tell stories to your child not from a book?
- How often do you play music, listen to music, sing songs or nursery rhymes, dance or do other musical activities with your child?
- How often do you draw, paint or make things with your child?
- How often do you play sports or physically active games outdoors or indoors with your child?
- How often do you play with toys or indoor games with your child?
- How often do you take your child to the park or to an outdoor playground?

Figure 3.3: Differences in family background and demographics, by SEP quintile



through which socioeconomic status leads to lower cognitive outcomes among the poorest children. Differences in the **home learning environment** play the biggest role among these factors. Box 3.1 explains in more detail what is included in our measure of the home learning environment.

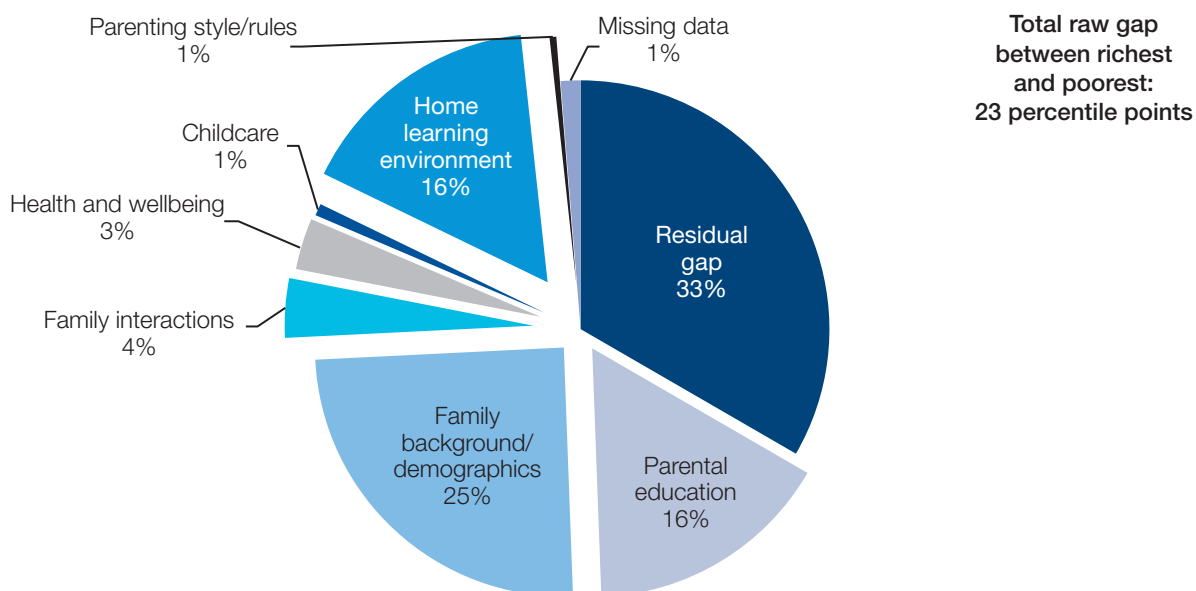
- Differences in parental education and family background factors explain a much bigger proportion of the gap in cognitive outcomes between rich and poor at age 3. The most important family background effects are mother's age at birth, number of siblings and, if present, whether father is in work. While it is obvious that family background factors such as these must have their effect on cognitive outcomes through some mechanism, our analysis suggests that this mechanism is *not* primarily the early caring environment as captured in our study, and indeed cannot be discerned in this study.
- Around a third of the total gap in cognitive outcomes between children from the poorest and the richest backgrounds remains

unexplained by any of the observable characteristics in our model.

We repeat this decomposition for outcomes at age 5 (Figure 3.5), but we also include 'prior ability' at the age of 3 among the explanatory variables considered. By doing this, we can try to understand what contributes to the *widening of the gap* between the poorest children and those from better-off backgrounds between the ages of 3 and 5. Our findings suggest:

- About half of the gap at age 5 can be explained by **prior ability**. There is a strong *persistence* in cognitive outcomes between children at ages 3 and 5: children who were already ahead in terms of their cognitive development at the age of 3, typically remain ahead by the age of 5.
- In general, differences in the early childhood caring environment as measured by our study do not seem to play much of a role in explaining why the gap has grown between the ages of 3 and 5. One exception is differences in the home learning environment at the age of 3 (but interestingly, not at the age of 5). Our findings thus suggest that

Figure 3.4: Explaining the gap between the poorest and the richest at age 3: decomposition analysis



Notes: The relative contributions of each set of factors are calculated by multiplying the difference in the proportions of rich and poor with each characteristic by the coefficient estimates from a regression model of cognitive outcomes which includes all explanatory characteristics simultaneously. For more details, see Dearden *et al.* (2010).

policies aimed at narrowing the gap between rich and poor children at the age of 5 will be more effective if they focus attention on the home learning environment provided to children at age 3, rather than at age 5.

- In contrast, parental education, family size and family structure (in particular, mother's age) do explain a significant proportion of the widening gap. However, the exact mechanism through which these factors contribute to the widening of the gap cannot be discerned from our study.

Summary and conclusion

In summary, this chapter has found that there are big differences in cognitive development between children from rich and poor backgrounds at the age of 3, and that this gap widens by the age of 5. Our companion working paper (Dearden *et al.*, 2010) has found similarly large gaps in young children's social and emotional wellbeing.

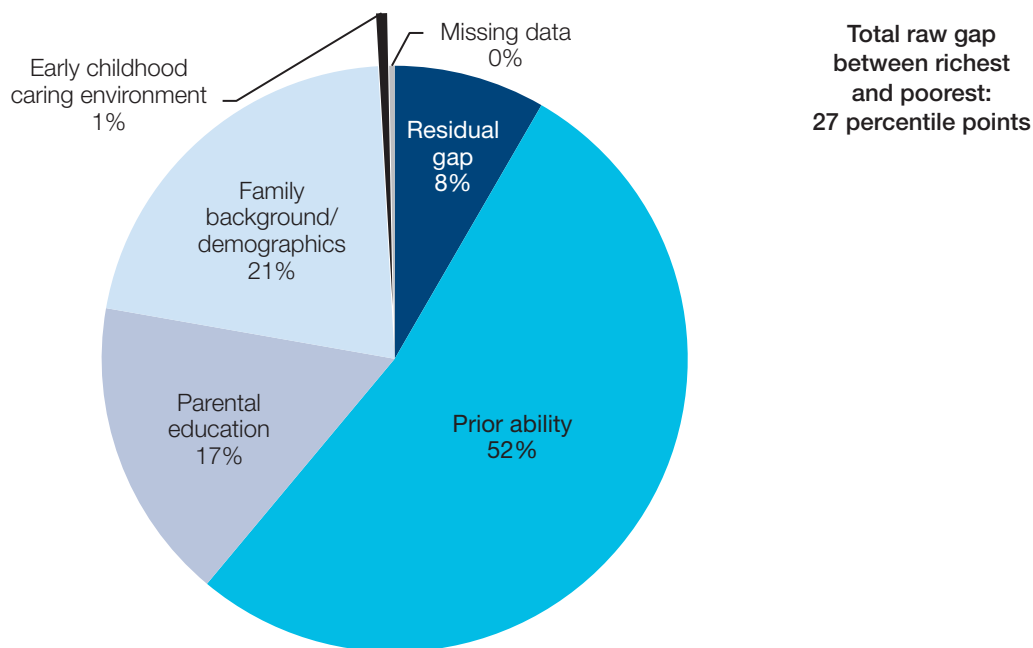
Children from poor backgrounds also face much less advantageous early childhood caring environments than children from better-

off families. For example, we have identified significant differences in poor children's and their mothers' health and wellbeing (e.g. birth weight, breastfeeding and maternal depression); family interactions (e.g. mother-child closeness); the home learning environment (e.g. reading regularly to the child); parenting styles and rules (e.g. regular bedtimes and mealtimes); and experiences of childcare by ages 3 and 5.

Differences in the home learning environment, particularly at the age of 3, have an important role to play in explaining *why* children from poorer backgrounds have lower test scores than children from better-off families. However, a much bigger proportion of the gap remains unexplained, or appears directly related to other aspects of family background (such as mother's age, and family size) that are not mediated through the early childhood caring environment.

This suggests that policies to improve parenting skills and home learning environments in isolation cannot possibly *eliminate* the cognitive skills gap between rich and poor young children, although such policies could go some way towards reducing it. On the other hand, the findings in our companion working paper (Dearden *et al.*, 2010) suggest

Figure 3.5: Explaining the gap between the poorest and the richest at age 5: decomposition analysis



Notes: The relative contributions of each set of factors are calculated by multiplying the difference in the proportions of rich and poor with each characteristic by the coefficient estimates from a regression model of cognitive outcomes, which includes all explanatory characteristics simultaneously. For more details, see Dearden *et al.* (2010).

that many aspects of the early childhood caring environment do have a positive effect on children's social and emotional development, suggesting that policies aimed at improving health, parenting skills and the home learning environment could have other important short- and long-term pay-offs.

4 From birth through primary school: evidence from the Avon Longitudinal Study of Parents and Children

Paul Gregg and Elizabeth Washbrook (CMPO)

The gap in educational attainment between the poorest children and children from better-off backgrounds, already large at age 5, grows rapidly during the primary school years, such that by age 11, only around three quarters of children from the poorest fifth of families reach the government's expected level at Key Stage 2, compared to 97% of children from the richest fifth. Poor children who perform well at age 7 have all too often slipped back by age 11, while poor children who perform badly at age 7 are far less likely to catch up over the period.

This chapter explores the role of the aspirations, attitudes and behaviours of mothers and children in the emergence of these gaps and, importantly, the increase over time. Unfortunately, the extent of similar information from fathers was lacking in the study.

We find that, even after accounting for long-run family background factors and prior attainment, children are more likely to perform well in tests at age 11 if:

their mother:

- has an external locus of control (i.e. believes that her own actions can make a difference, rather than things being determined solely by fate or chance);
- hopes that the child will stay in education beyond age 16, particularly if she would like them to go on to university;
- found school valuable herself;

the child:

- has strong beliefs in his or her own ability;

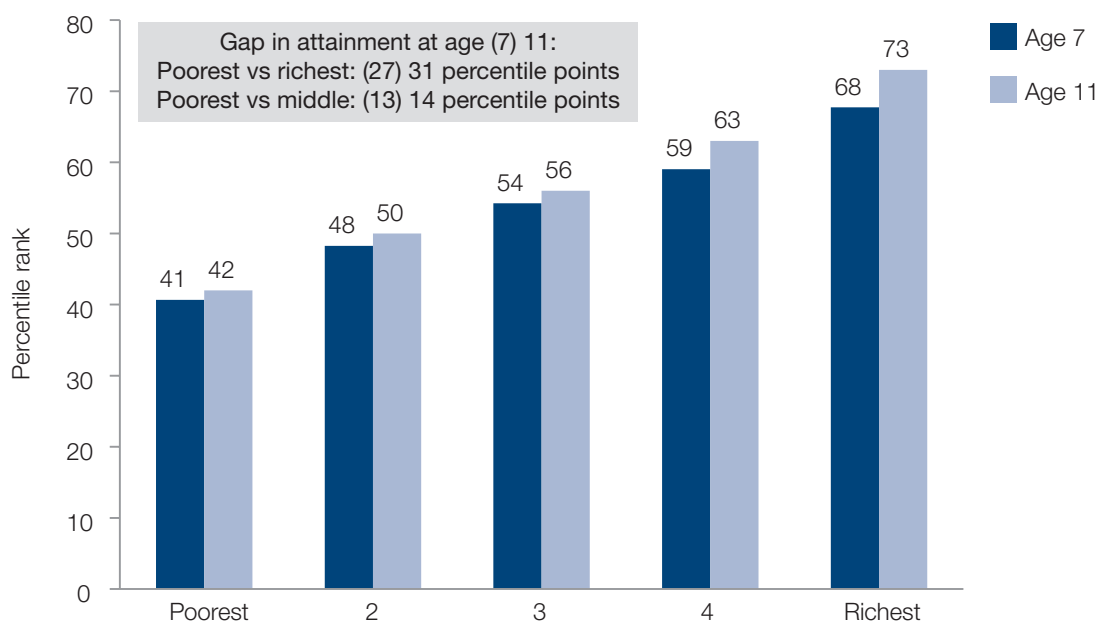
- believes that school results are important;
- has an external locus of control;
- is less likely to engage in antisocial behaviour (such as fighting or stealing);
- does not suffer from hyperactivity or conduct problems;
- has not experienced bullying.

The analysis suggests that children from poorer families are less likely to have these attributes than children from richer families, and this can make a substantive contribution to why children from poorer families tend to have lower educational attainment than children from richer families. Indeed, we find that differences in attitudes and behaviours during primary school account for around 12% of the total gap between the poorest and richest children (or around one third of the gap in progress between ages 7 and 11). This suggests a potentially significant role for policy in raising educational attainment by shaping attitudes and behaviours during the primary years.

Test scores of children from poor backgrounds at ages 7 and 11

Figure 4.1 shows the average ranking in Key Stage tests of children at ages 7 and 11, according to their family's SEP. The social gradients in attainment are marked, with the poorest fifth of children scoring, on average, 14 percentile points lower than the middle fifth of children in Key Stage 2 tests at age

Figure 4.1: Average test score rank, by SEP quintile



Note: Authors' calculations using Key Stage test scores from the NPD for the ALSPAC cohort. In contrast to other chapters in this report, we define our quintiles of SEP on a national basis. This explains why it is possible for there to be rising average attainment across all SEP groups.

11, and 31 percentile points lower than the richest fifth. The growth in the gap between the poorest children and those from better-off backgrounds is quite rapid over the primary school years, meaning that the gradient is steeper at age 11 than at age 7. (The gap at age 7 is very similar to that found in the previous chapter using MCS data at age 5.) Table 4.1 makes a similar point, showing children's school results in a more intuitive way using the proportions achieving expected attainment thresholds for Key Stage tests.

This steepening in the gradient between the ages of 7 and 11 occurs through a process where poorer children who perform well at age 7 are more likely than rich children to have slipped back by age 11, and poorer children who perform badly at 7 are less likely to catch up over the period. For example, while 54% of children from the richest backgrounds who find themselves in the bottom 40% at age 7 have moved up by age 11, only 23% of the poorest fifth of children have managed to escape.

Differences in aspirations, attitudes and behaviours by socioeconomic background

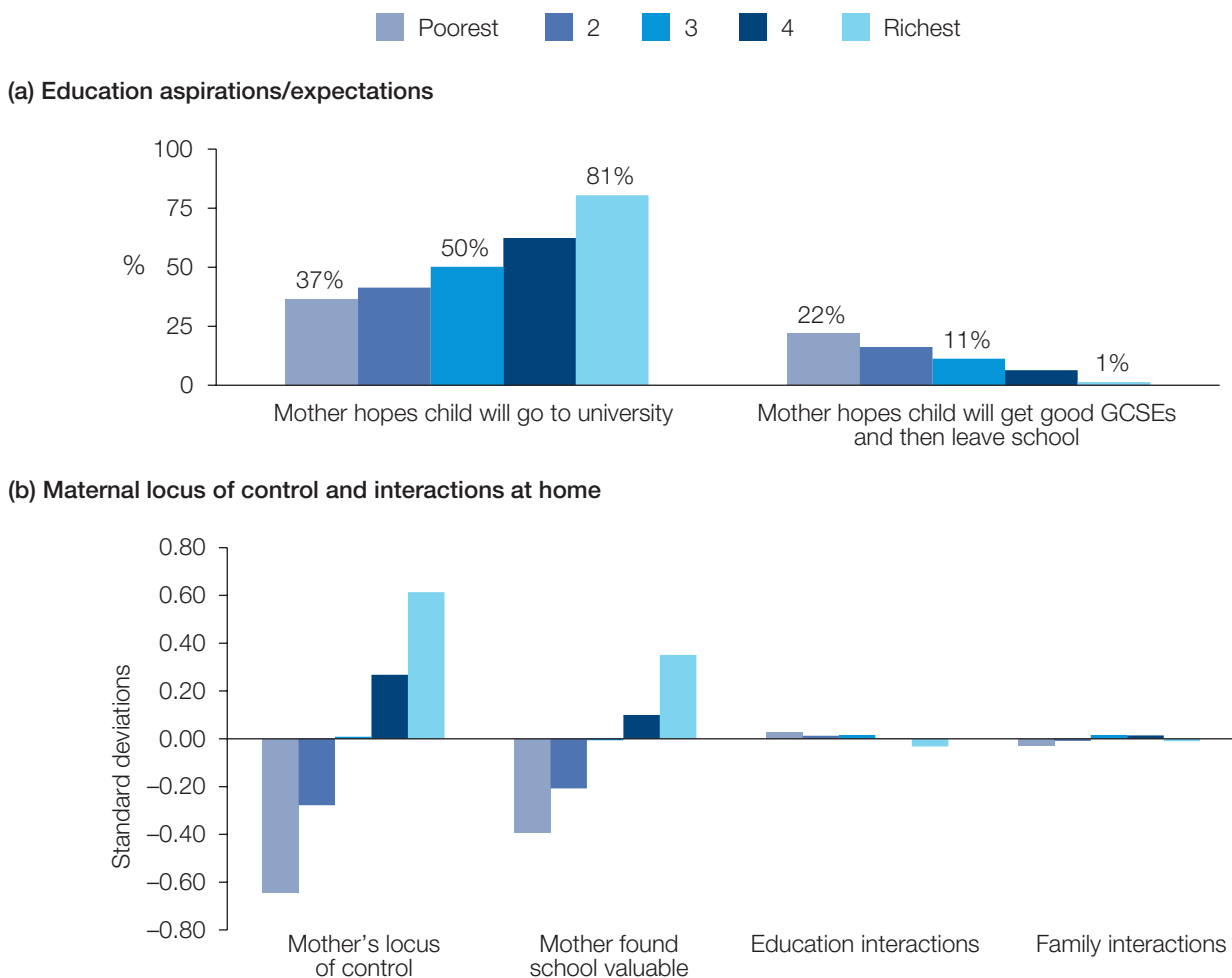
How can we explain these large gaps in attainment between children from rich and poor families? In this section we document differences in a range of other characteristics, including mother and child attitudes and behaviours, between children from rich and poor backgrounds, which might help to explain the differences in attainment that we observe.

Figure 4.2 shows information on a range of maternal attitudes and behaviours, particularly regarding education. Maternal aspirations for the child to attend university are one of the most socially graded of these factors, with 81% of the richest mothers reporting that they hope their

Table 4.1: Educational outcomes (percentage reaching expected level), by SEP quintile

	Average outcome by SEP quintile				
	Poorest	2	Middle	4	Richest
Key Stage 1 (age 7)	73.1	82.2	86.8	90.3	95.9
Key Stage 2 (age 11)	74.2	84.0	90.5	92.9	97.0

Figure 4.2: Parental attitudes and behaviours, by SEP quintile



Note: Measures constructed using information from a postal questionnaire to mothers when their child was 9 years old. For full details, see Gregg and Washbrook (2009).

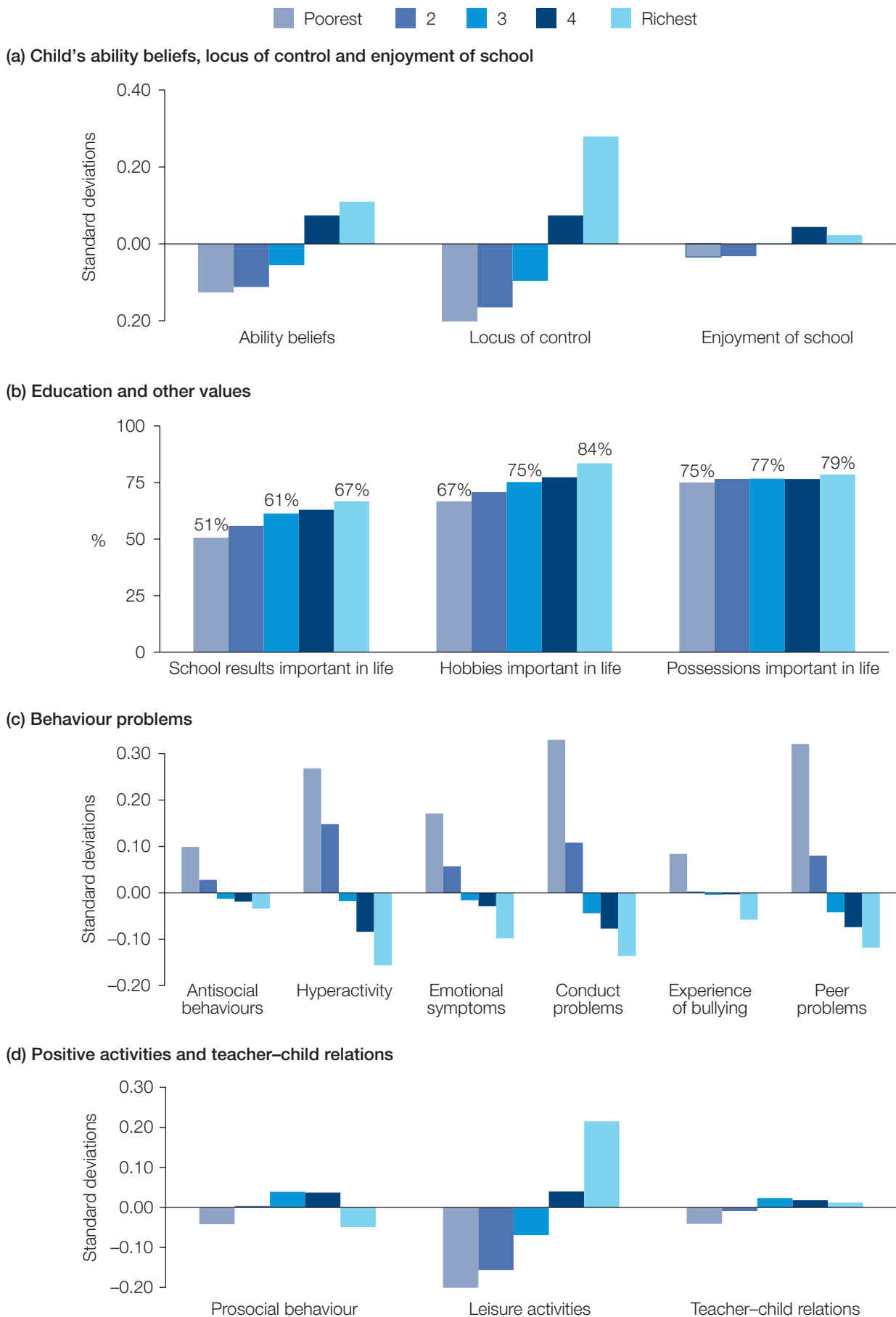
9-year-old will go to university, compared with only 37% of the poorest mothers. By contrast, mothers' hope that the child will get decent GCSEs and stop there is almost unheard of among affluent families, but not uncommon among the less affluent. There are also large differences by socioeconomic background in whether the mother found school valuable for herself, and her locus of control – which measures the extent to which she feels that her own actions can make a difference, rather than things being determined by fate or chance. However, direct educational and other interactions between parents and children such as the frequency of mother making things, singing, reading, drawing and painting, helping with homework, helping prepare for school, having conversations with the child at age 9 do not appear to differ much by socioeconomic background at this age, and so do

not form a major part of the story of educational inequality.

Figure 4.3 reports differences in aspirations, attitudes to schooling and belief systems such as ability beliefs and locus of control among children from rich and poor families. It also describes differences in a number of child behaviours, reported by parents, such as antisocial behaviour, conduct problems and hyperactivity. Most, but not all, of these are socially graded.

For example, children from poorer families have much less belief in their own ability than children from richer families; they are also much less likely to think that their own actions are important in determining future outcomes, and place much less emphasis on school results and hobbies as being important in life. On the other hand, children from different socioeconomic backgrounds do not differ

Figure 4.3: Young person attitudes and behaviours, by SEP quintile



Note: Measures constructed using information from a hands-on clinic session when children were 8 years old, and a postal questionnaire to mothers when their child was 9 years old. For full details, see Gregg and Washbrook (2009).

much in terms of the importance that they place on material possessions, nor in the extent to which they enjoy school.

Children from poorer backgrounds are also more likely to suffer from behaviour problems. Conduct disorders and hyperactivity (as assessed from questions answered by the mother) are strongly socially graded, but differences in antisocial and prosocial behaviours are less marked. Peer problems as reported by the child, and to a lesser extent bullying, are also graded by family background.

In the Appendix we provide additional context by showing which of these factors are positively and negatively associated with attainment at age 16, from a simple multivariate regression model. In the next section, we move on to examine whether these differences can help to explain the gaps in educational attainment at age 11.

Accounting for lower test scores by the age of 11 for poorer children

As we saw in the previous section, poorer and more affluent families differ across a range of domains, not just financially. In this section we investigate the extent to which these differences help to explain the very large gaps in attainment that we set out in Figure 4.1. We do this using a ‘decomposition’ analysis, which splits the ‘raw’ gap in test scores (of 31 percentile points at age 11) into the contributions of various sets of factors, including parental education and other family background characteristics, schools, and mother and child attitudes and behaviours. More specifically, the relative contribution of each characteristic is calculated by multiplying the difference in the proportions of rich and poor children with that characteristic by the coefficient estimates from a regression model of child test scores that includes all characteristics simultaneously.¹¹

Figure 4.4 gives the details of the contribution of each broad category of factors to the overall picture of socioeconomic gradients in child attainment at age 11. This is undertaken first excluding prior ability at age 7 (top panel) and then including prior ability (bottom panel) and hence exploring changes after age 7. What stands out very strongly from the first panel of Figure 4.4 is how important

parent and child attitudes and behaviours appear for explaining the rich–poor gap in child test score outcomes, when we do not control for prior ability in our model: together they account for 40% of the socioeconomic gradient.

However, without controlling for prior ability, it is difficult to ascertain how much of the apparently large contribution of these attitudes and behaviours to the rich–poor gap is in fact due to the large differences in cognitive ability of children from different backgrounds, which is already apparent by this age. When prior ability is taken into account (bottom panel of Figure 4.4), attitudes and behaviours still explain about 12% of the total gap between the poorest and richest children (and around a third of that element that is not accounted for by prior ability, or in other words the gap in *progress* made by different children between these ages).

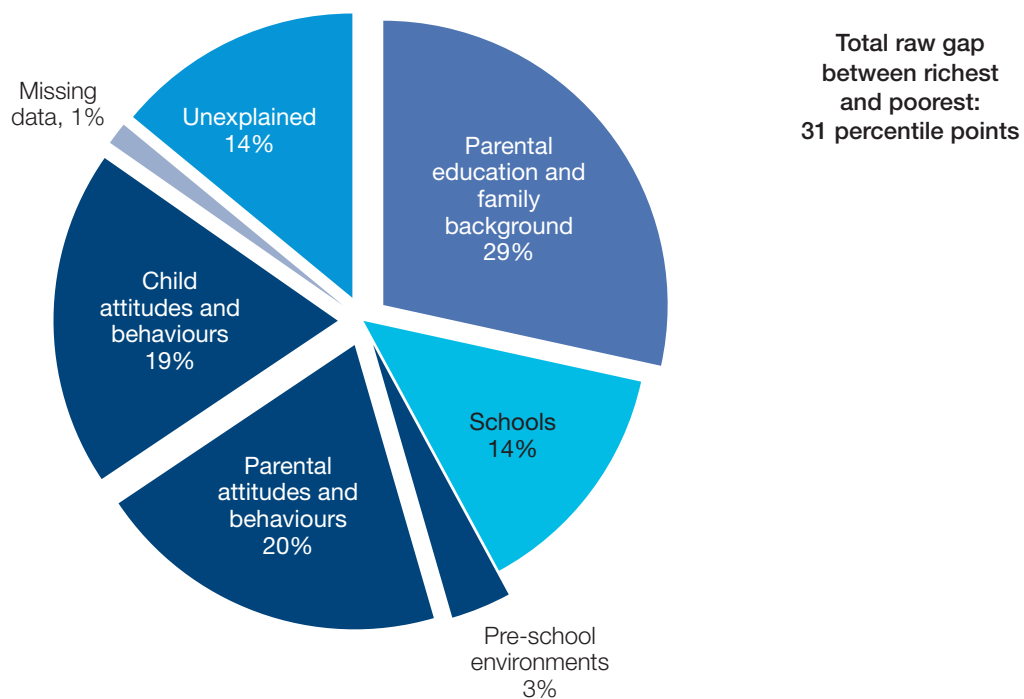
The introduction of attainment at age 7 reduces the contribution of schools and our measures of attitudes and abilities substantially. This suggests that much of what these factors reflect is coming before age 7 or underlying differences in family interaction and decision-making that are common through much of the child’s life up to this point rather than something specific to the primary years. The models which condition on prior attainment are more specific to this timeframe but again may reflect underlying differences in parental attitudes etc. that are common to all age periods rather than the specific activities or beliefs identified at this age.

Overall, the family characteristics, education level of parents, school quality and all the measures of attitudes and belief factors can explain the vast majority of the socioeconomic gradient in educational attainment. This is especially true when prior attainment is included. Hence, the big stories about the socioeconomic gradients in test scores are well captured by the data available.

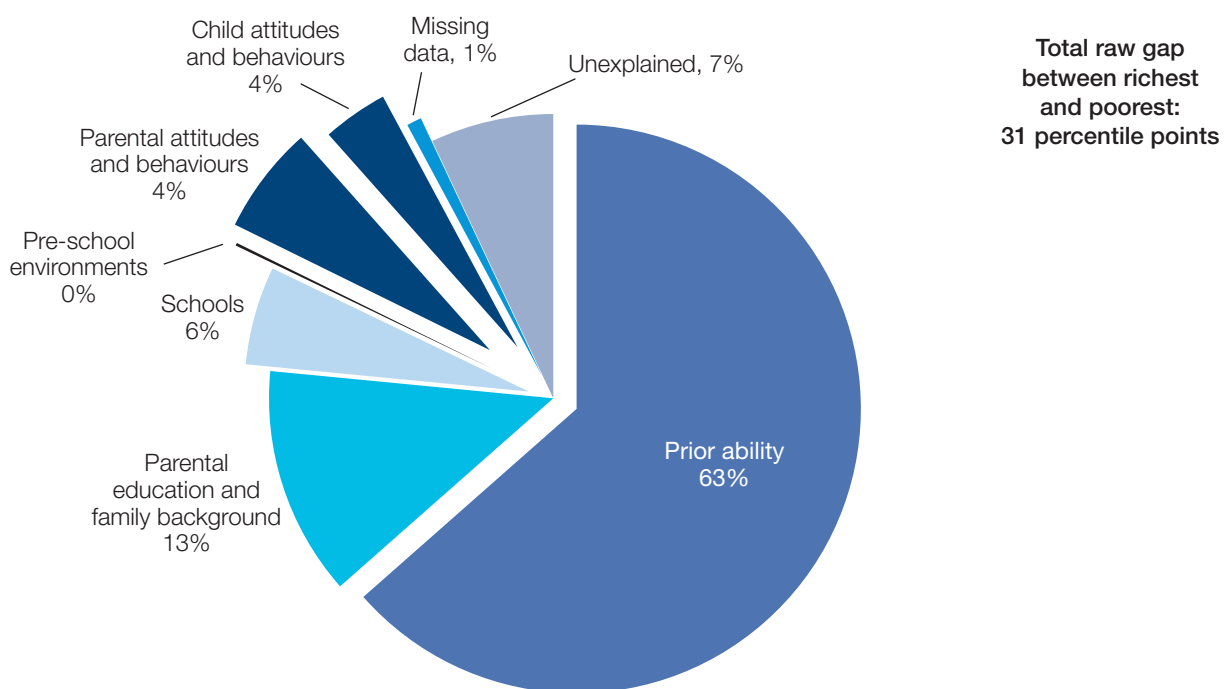
Figure 4.5 unpacks the bundles of attitudes, behaviours and aspirations and hence pulls out the contribution of each element contained in the broad categories described above. This is undertaken for the models that condition on prior attainment and thus reflect contributions to progression between ages 7 and 11. What is immediately striking is the very large contribution from the mothers’ hopes that their child will go to university: this factor alone

Figure 4.4: Explaining the gap between the poorest and the richest: decomposition of direct effects at age 11

(a) Not controlling for prior ability

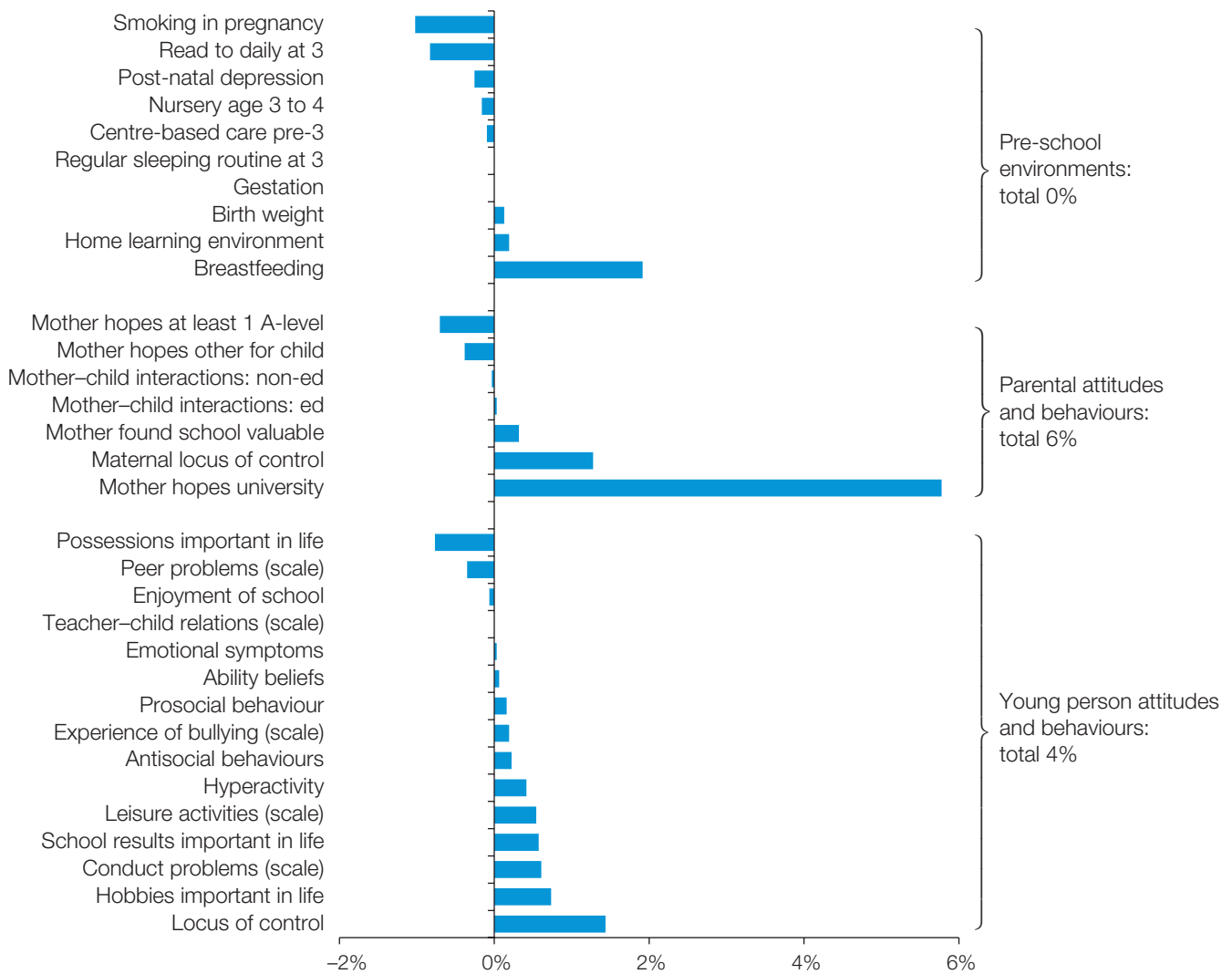


(b) Controlling for prior ability



Note: The relative contributions of each set of factors are calculated by multiplying the difference in the proportions of rich and poor with each characteristic by the coefficient estimates from a regression model including all characteristics simultaneously. For more details, see Gregg *et al.* (2010).

Figure 4.5: Further decomposition of the test score gap between richest and poorest (accounting for prior ability): child and parent attitudes and behaviours



Note: The relative contributions of each set of factors are calculated by multiplying the difference in the proportions of rich and poor with each characteristic by the coefficient estimates from a regression model of cognitive outcomes, which includes all explanatory characteristics simultaneously. For more details, see Gregg *et al.* (2010).

accounts for around 6% of the gap in test scores between children from rich and poor families. Furthermore, this contribution already takes into account the child’s ability at age 7 and so isn’t just a reflection of poor chances of getting to university based on ability. Rather, there are marked differential expectations of what the child could achieve between affluent and poorer families and this is strongly associated with the widening gaps in outcomes.

The second noticeable feature is the long string of relatively small contributions reflecting the child’s attitudes, beliefs and behaviours. There is not one stand-out factor here but rather a lot of related factors covering hyperactivity and conduct

problems, attitudes to the importance of school results (and hobbies) to later lives and a differential sense that your own actions and effort make a difference rather than it just being down to fate. This last factor (locus of control) is also strongly in evidence in mothers too.

Summary and conclusions

This chapter has explored the contribution of mother and child attitudes and behaviours during the primary years to differences in educational attainment between children from rich and poor backgrounds at age 11. We find that attitudes and behaviours together account for around

12% of the gap after controlling for prior ability at age 7, and around a third of the progress made between ages 7 and 11. Broadly, we interpret these measures of attitudes and behaviours as transmitters of social and educational disadvantage onto the child's educational attainment. However, this does not mean that changing these transmission mechanisms will necessarily reduce the socioeconomic gap in attainments, because the measures are likely to be indicative of wider processes operating within families and peer groups and there are likely to be other unmeasured differences across families, which our measures are partially capturing. However, they do suggest an important role for policy trials in this area, which we discuss further in our conclusions in Chapter 7.

5 Outcomes in the secondary school years: evidence from the Longitudinal Study of Young People in England

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While gaps in educational attainment appear early, they also tend to widen substantially throughout the primary and into the secondary schooling years, as discussed in Chapter 1 (see Figure 1.2). Indeed, by the time young people take their GCSEs, the gap between rich and poor is substantial: for example, only 21% of the poorest fifth (measured by parental SEP) manage to gain five good GCSEs (grades A*–C, including English and maths), compared to 75% of the top quintile – an astonishing gap of 54 percentage points.

The first message that emerges from this strand of our work is that it is decisions and investments made considerably *earlier* in young people's lives that appear to be the main drivers of differences in educational outcomes during the teenage years. Attainment gaps at age 11 are already large and the further widening is relatively small in the teenage years compared to earlier in childhood. However, there is evidence that the attitudes and behaviours of teenagers and those of their parents do further contribute to the attainment gaps in GCSE results. For example, even after controlling for long-run family background factors and prior attainment, we find that young people are more likely to do well at GCSE if:

their parents:

- think it likely that they will go on to HE;
- spend time sharing family meals and outings; quarrel with their child relatively infrequently;

- devote material resources towards education including private tuition, computer and internet access;

the child:

- has a greater belief in his or her own ability at school;
- believes that his or her own actions make a difference and that he or she can control events that affect him or her (captured in this study by having an 'external economic locus of control');
- finds school worthwhile;
- thinks it is likely that he or she will apply to, and get into, HE;
- avoids risky behaviours such as frequent smoking, cannabis use, antisocial behaviour, truancy, suspension and exclusion;
- does not experience bullying.

Since young people growing up in poor families do less well in all these respects compared to young people growing up in better-off families, this provides some explanation for their poorer educational attainment by the end of post-compulsory schooling. Overall, these factors contribute just under a *quarter* of the education gaps at age 16, and for the majority of the small increase in the rich–poor attainment gap between ages 11 and 16.

While our research highlights that raising attainment among poor children before they get to secondary school is almost certainly the most effective time for intervention, our findings also suggest that policies focused at the teenage years may also have some beneficial effects in terms of preventing the poorest teenagers falling further behind. Specific policies include those that aim to raise parental and young people's educational expectations, and improve their behaviours at school and outside.

What are the educational outcomes of children from poor backgrounds at ages 11 to 16?

Figure 5.1 highlights the gaps in educational attainment between young people from different socioeconomic backgrounds at ages 11, 14 and 16. It shows the average percentile rank of national Key Stage test scores by quintile of parental SEP.

As shown in Chapter 4 for the primary school aged children in the ALSPAC cohort, there are already large and significant socioeconomic differences in educational attainment by age 11, and the further widening of these gaps in the teenage years is relatively small compared to earlier in childhood. By age 16, when test scores represent results at GCSE level (the first level of formal academic qualification in English schools),

young people from the richest families score 33.3 percentile points higher, on average, than young people from the poorest families. (This compares to a gap of 31 percentile points at age 11.)

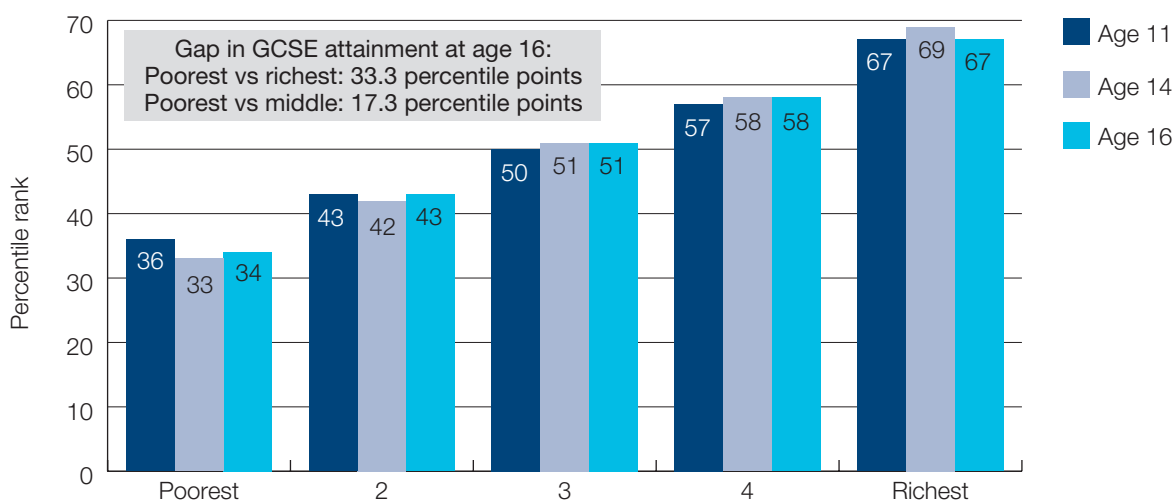
Table 5.1 highlights just how large these differences in attainment are in more intuitive terms: for example, at age 16, only one in five young people from the poorest families achieve five good GCSEs including English and maths, compared to three quarters of young people from the richest families.

How do the attitudes and behaviours of parents and young people from rich and poor backgrounds compare at ages 14 to 16?

Young people from rich and poor families not only differ in how well they perform in exams, they also show marked differences in many family background characteristics (including parental education, family size and ethnicity), and their attitudes and behaviours (and those of their parents) in the teenage years, which may help to explain the large gaps in attainment that we saw in the previous section. Here, we document some of these differences in attitudes and behaviours, which are also laid out in the figures below.

We start by considering differences in parental aspirations, attitudes and behaviours. Figure 5.2 shows the following:

Figure 5.1: Key Stage test scores at ages 11, 14 and 16, by SEP quintile



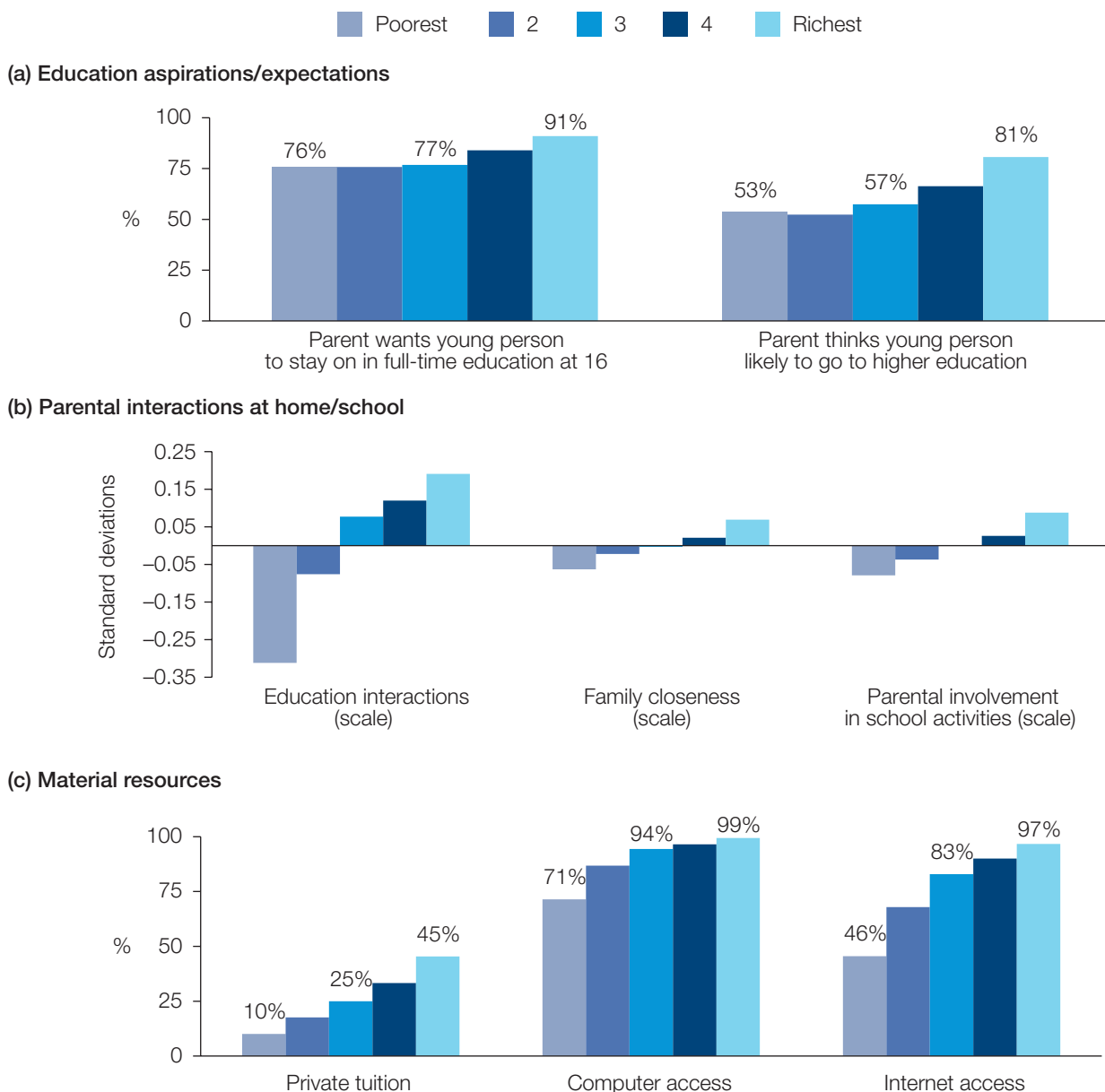
Note: Authors' calculations using Key Stage test scores from the NPD for the LSYPE cohort. Our sample includes all individuals for whom we observe Key Stage 2, 3 and 4 test scores.

Table 5.1: Educational outcomes (percentage reaching various levels), by SEP quintile

	Average outcome by SEP quintile				
	Poorest	2	Middle	4	Richest
Key Stage 2 (age 11)					
% reaching expected level	64.3	75.5	84.2	87.8	94.3
Key Stage 3 (age 14)					
% reaching expected level	51.9	66.1	77.4	84.7	92.7
Key Stage 4 (age 16)					
% attaining 5+ GCSEs A*-C	33.2	46.4	59.3	70.6	84.0
% attaining 5+ GCSEs A*-C including English and maths	21.4	33.6	46.4	57.9	74.3

Note: Authors' calculations using Key Stage test scores from the NPD for the LSYPE cohort. Our sample includes all individuals for whom we observe Key Stage 2, 3 and 4 test scores.

Figure 5.2: Parental attitudes and behaviours, by SEP quintile (age 14)



Note: Measures constructed using information from Wave 1 of the LSYPE (age 14). For full details, see Chowdry *et al.* (2010).

- **Expectations for education:** Richer parents tend to have higher expectations for their children's education than poorer parents. For example, four out of five parents in the top SEP quintile think that their child is likely to apply to university, compared to just over half of parents in the bottom SEP quintile at age 14.

It is worth noting, however, that expectations for HE are *high across the board*: many more parents, from *all* parental income backgrounds, think that their children will go to university, than eventually do go. This is borne out by data on actual HE attendance. For example, while at age 14 over half (53%) of parents from the poorest fifth of the LSYPE sample report that their child is likely to go to university, only one in eight (12.5%) of the poorest fifth of children among a slightly older cohort did actually go to university by age 19. Among the richest fifth of the LSYPE sample at age 14, four out of five (81%) of parents think that university is likely, whereas only just over half (52%) of the richest fifth actually go to university by age 19.¹²

Box 5.1 contains more analysis from the LSYPE about the influences on parents' and children's HE expectations.

- **Family interactions:** Parents in the top SEP quintile are more likely to help their children with their homework (education interactions scale), more likely to get involved in school activities and more likely to share family meals with their children (family-child interactions scale) than parents in the bottom SEP quintile.
- **Computer and internet at home:** Almost all young people from the richest families have access to a computer and the internet at home, compared with just over 70% of young people from the poorest families with access to a computer, and under half with access to the internet.

Figure 5.3 highlights differences in young people's attitudes and behaviours at age 14, and shows the following:

- **Ability beliefs, enjoyment of school, 'locus of control':** Young people from poorer families

have lower ability beliefs, are less likely to enjoy school, less likely to find school valuable and less likely to believe that their own actions make a difference ('external locus of control') than young people from richer families.

It is interesting to note, however, that poor children do not necessarily underestimate how well they do at school. Once we take test scores at Key Stage 2 into account, young people from poor backgrounds are typically *more* likely to think that they are good at school than young people from richer backgrounds. (This additional analysis is not shown in Figure 5.3, but can be found in Chowdry *et al.*, 2010.)

- **Expectations for higher education:** Young people from richer families tend to have higher educational aspirations and expectations than young people from poorer families, with nearly four fifths of teenagers in the top SEP quintile thinking it likely that they will apply to university (and get in), compared to less than half of teenagers in the bottom SEP quintile, a gap of almost 30 percentage points.

Again, it is interesting to note that HE expectations among young people at age 14 are *high across the board*: more young people think that they are likely to go to university from all socioeconomic backgrounds than will eventually end up going there.

Box 5.1 discusses some of the influences on young people's HE expectations formations, highlighting among other things, the inter-relationships between young people's attitudes to their future education, and the other attitudes and behaviours considered in this study, for example their ability beliefs, and how much they enjoy school.

- **Risky behaviours and positive activities:** Young people from poorer families are more likely to engage in a range of risky behaviours (such as smoking, taking cannabis, playing truant and other antisocial activities) at age 14 than young people from richer families. They are less likely to engage in positive activities such as playing sports, reading for pleasure and playing a musical instrument.

Box 5.1 Parents' and children's aspirations and expectations for education: where do they come from?

Our analysis of the LSYPE examined the factors that affect the likelihood that parents and children think that the young person will go on to higher education (HE) by age 14. It shows that:

- Parents and children's expectations for HE are very closely linked, and show many of the same determinants. For example, 84% of young people whose parent expected them to go on to HE at age 14 also shared that expectation.
- A young person's prior attainment is the strongest of all the influences we have considered. Both parents and children are more likely to expect that the young person will go on to HE, the stronger that they have performed at Key Stage 2 (age 11). This suggests that parents and children take academic ability into account in forming their HE expectations.
- Even after prior attainment is controlled for, a number of other factors appear to be significant influences on HE expectations, the following in particular:
 - **Parents' SEP and educational attainment:** In particular, if a mother holds a university degree herself, she is more likely to expect that her child will go to university than if she does not.
 - **Gender and ethnicity:** The parents of girls, and girls themselves, have

much stronger expectations for future HE attendance than boys. All non-white ethnic groups, and those with English as an Additional Language are significantly more likely to think that HE is likely for them compared to white people, and those for whom English is their first language.

- **Schools:** Children attending schools with a strong KS2–3 value added score, or those at a school with a sixth form or at grammar school, are more likely to think that HE is likely than children in other schools.
- **Other attitudes and behaviours:** There are strong interrelationships between parents' and children's HE expectations, and the other attitudes and behaviours we have considered in our study. For example, parents who provide more educational interactions at home (e.g. help with homework) are more likely to expect their child to go to university. Young people who have a strong belief in their own ability and enjoy school are also more likely to be positive about their prospects for HE. Bad behaviour at school and engagement in certain risky behaviours (e.g. smoking) are associated with lower expectations for future HE attendance.

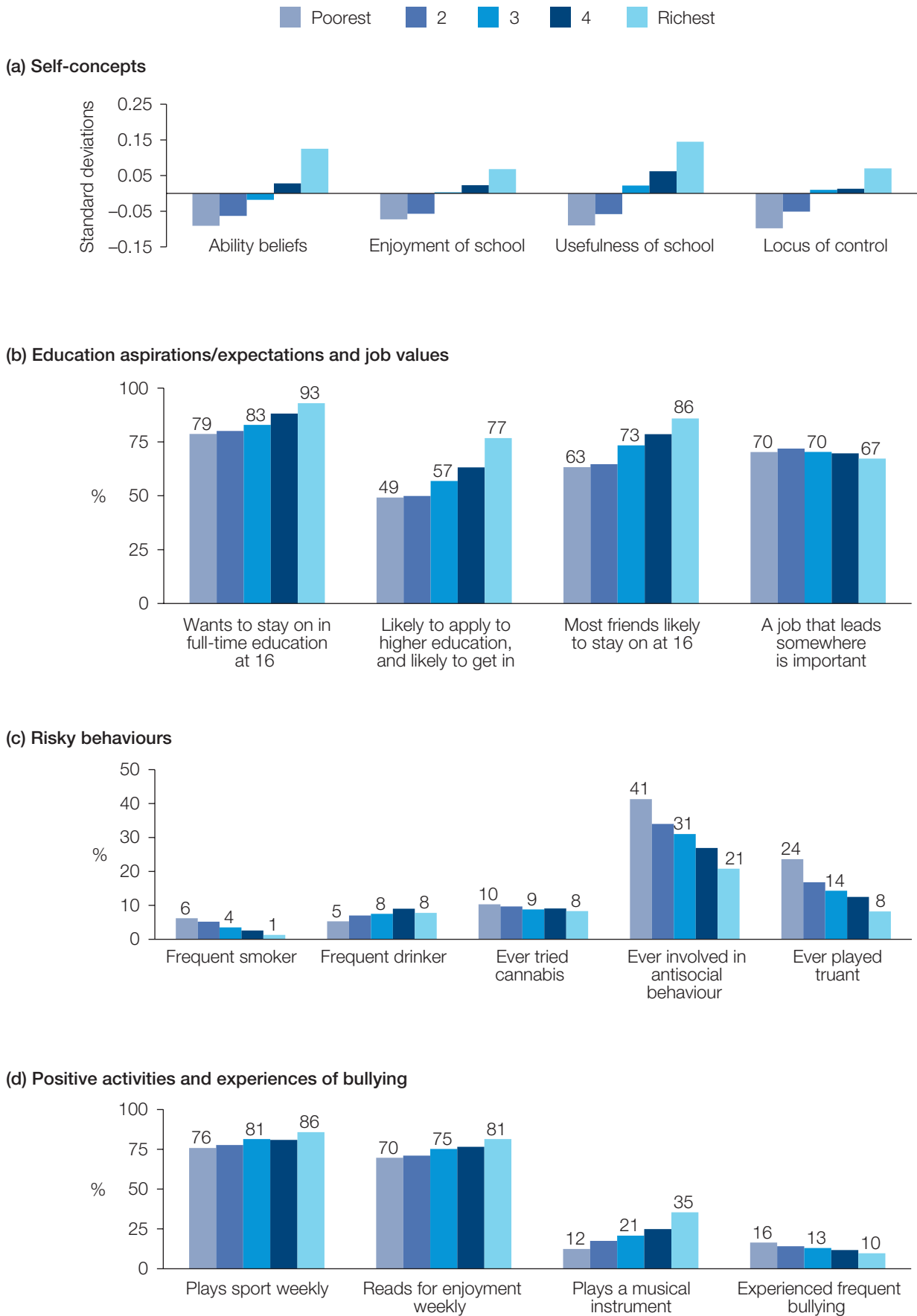
- **Experiences of bullying:** Young people from poor backgrounds are also more likely to experience frequent bullying at age 14 than young people from richer backgrounds.

Figure 5.4 shows how young people's attitudes and behaviours *change* between ages 14 and 16.

It is interesting to observe that on average, young people are more likely to experience

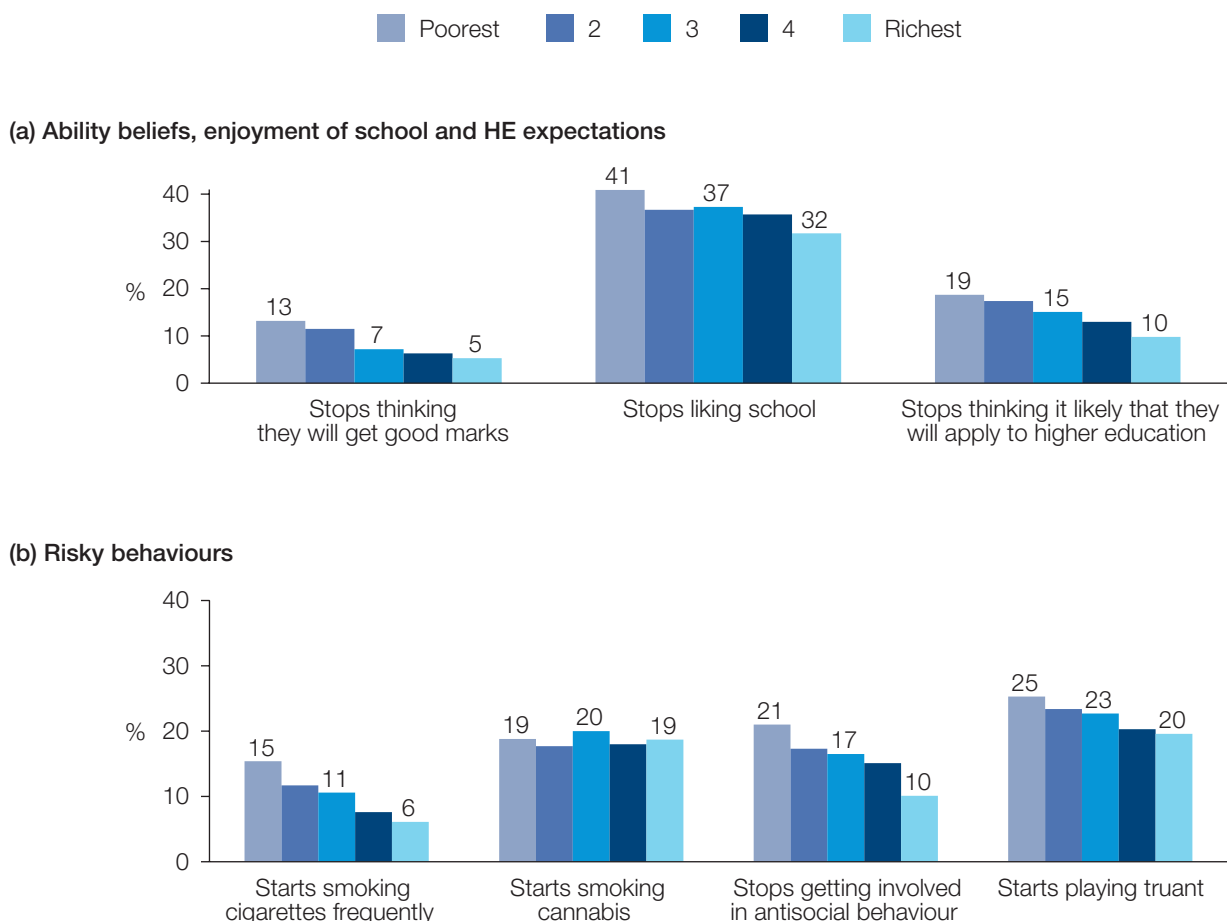
negative than positive changes in their attitudes and their engagement in risky behaviours over this period: this means that there is a *marked decline* in teenage attitudes and behaviours between ages 14 and 16 across all socioeconomic groups. For example, a very large proportion of young people appear to stop liking school, in particular as they move from Year 9 into Year 10 (see Chowdry *et al.*, 2010, for details).

Figure 5.3: Young person attitudes and behaviours, by SEP quintile (age 14)



Note: Measures constructed using information from Wave 1 of the LSYPE (age 14), except for locus of control, which is based on information from Wave 2 (age 15). For full details, see Chowdry *et al.* (2010).

Figure 5.4: *Changes between ages 14 and 16 in young person attitudes and behaviours, by SEP quintile*



Note: Measures constructed using information from Waves 1 and 3 of the LSYPE (age 14 and age 16). For full details, see Chowdry *et al.* (2010).

Moreover, young people from poorer families are more likely to experience negative changes than young people from richer families. This means that the difference in attitudes and behaviours between young people from rich and poor backgrounds widens markedly over this period.

For example, young people from poorer families are more likely to stop thinking they will get good marks, more likely to stop liking school and more likely to stop thinking that they will apply to university, than young people from richer families. Of particular note is a deterioration in expectations for HE among young people in the poorest fifth (particularly between Year 9 and Year 10 – see Chowdry *et al.*, 2010), as somewhat more realistic expectations appear to set in about their likely prospects for university.

Young people from poorer families are also more likely to start engaging in a range of risky behaviours (including frequent smoking and truancy) between ages 14 and 16 than young people from richer families, suggesting that the gap in engagement in risky behaviours also increases over time. One exception is in the incidence of antisocial behaviour, which typically falls between these ages, particularly among children from poorer families.

To summarise, this section has shown that there are substantial differences between young people from rich and poor families in terms of their attitudes towards education, and their propensity to engage in a range of risky behaviours as teenagers.

In the Appendix we provide important additional context by showing which of these factors are positively and negatively associated with attainment

at age 16, from a simple multivariate regression model.

In the next section, we move on to examine whether these differences can help to explain the gaps in educational attainment that we have seen.

Can differences in attitudes and behaviours explain the attainment gap between children from poor and better-off backgrounds?

The last section documented the very large gaps in educational attainment between young people from rich and poor families. In this section, we try to explain why these differences arise. Of particular interest to us is the importance of attitudes and behaviours of young people and their parents during the teenage years, which the last section showed differ markedly by socioeconomic background.

Specifically, we investigate whether attitudes and behaviours during the teenage years play an important role in explaining why children from poor families end up with worse GCSE results than children from rich families, or instead whether the root causes of these differences lie in the environments experienced by children from different socioeconomic backgrounds much earlier in life.

We do this using a ‘decomposition’ analysis, in which we decompose the very large gap (of 33.3 percentile points) in educational attainment at age 16 between young people from the top and bottom SEP quintiles into the contribution made by each of the different characteristics included in our model. The relative contribution of each characteristic is calculated by multiplying the difference in the proportions of rich and poor children with that characteristic by the coefficient estimates from a regression model of children’s test scores that includes all characteristics simultaneously.¹³

We group the characteristics in our model according to those that are likely to reflect early life influences on young people’s attainment, and others that relate directly to circumstances during the teenage years, as follows (for more details of exactly what these are, see Figure 2.1 in Chapter 2):

Capturing earlier influences

- parental background and demographics;
- prior ability (at Key Stages 2 and 3);

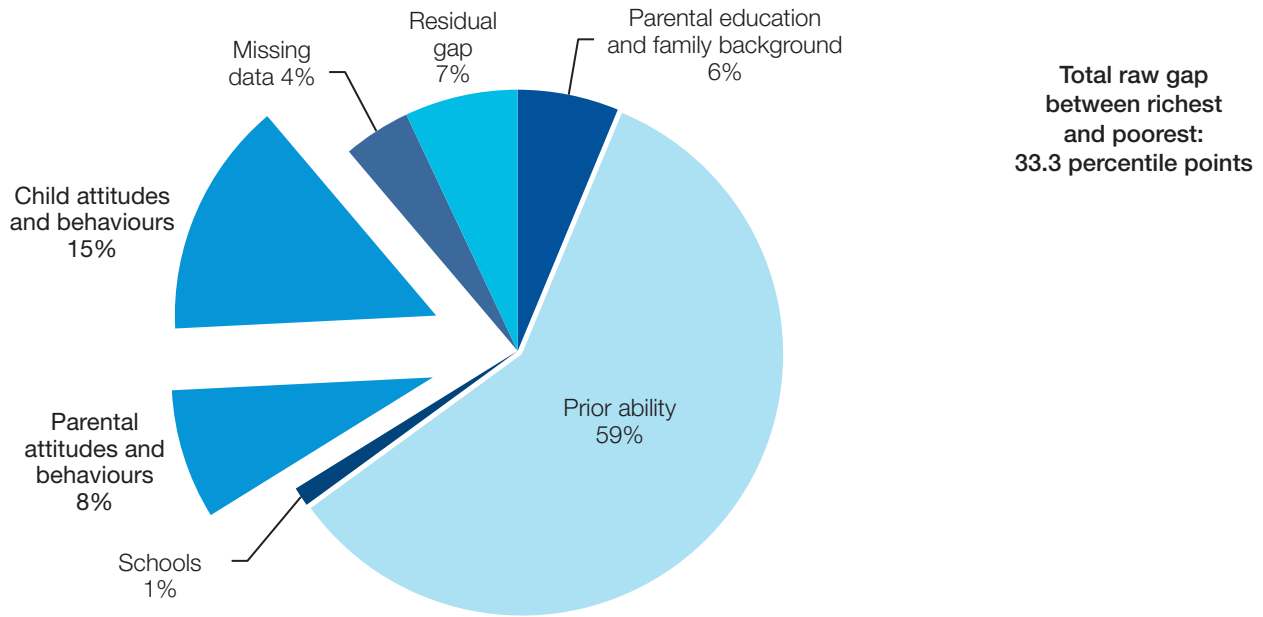
Pathways during the teenage years

- parental attitudes and behaviours during the teenage years;
- secondary school characteristics;
- young people’s attitudes and behaviours during the teenage years.

Figure 5.5 presents the results of the decomposition analysis, and shows that:

- Differences in prior attainment explain about 60% of the gap in test scores between young people from rich and poor families. This means that children who do well in school at ages 11 and 14 are also likely to do well in their GCSEs, irrespective of other circumstances.
- Family background factors (including parental education) account for only a relatively small fraction of the attainment gap between young people from rich and poor families (6%). This suggests that the effect of parental education and family background on attainment at age 16 works largely *through* its influence on attainment by age 11.¹⁴ Family background factors may also work through their effect on parental attitudes and behaviours during the teenage years.
- Differences in parental (8%) and young people’s (15%) attitudes and behaviours captured at ages 14 and 16 together explain roughly *one quarter* of the gap in GCSE results between young people from rich and poor families (and the majority of the gap that is not accounted for by prior ability).
- After controlling for all these characteristics, we find that a fairly small proportion – 7% (2.4 percentile points) – of the difference in test scores between young people from rich and poor backgrounds does not appear to be mediated through the other factors in our model, and hence remains unexplained (the ‘residual gap’ shown in Figure 5.5). This gap is

Figure 5.5: Explaining the gap between the poorest and the richest at age 16: decomposition analysis



Note: The relative contributions of each set of factors are calculated by multiplying the difference in the proportions of rich and poor with each characteristic by the coefficient estimates from a regression model including all characteristics simultaneously. For more details, see Chowdry *et al.* (2010).

very small compared to the ‘raw’ gap between poorest and richest that we have set out to explain, and highlights that the factors included in our model do a good job of explaining the vast majority of the difference in GCSE results between young people from rich and poor backgrounds.

- It is interesting to note that the relative contributions of each of these groups of factors are broadly similar if we compare the test scores of the poorest children with those in the middle SEP group (for details, see Chowdry *et al.*, 2010).

While Figure 5.5 provides an overview of which broad categories of factors explain the gap in GCSE attainment between young people from rich and poor families, Figure 5.6 explores in more detail the contribution of individual attitudes and behaviours. It therefore tells us *which* of the parent and young people’s attitudes and behaviours are most important for explaining why young people from poor families have lower GCSE attainment than those from richer families.

Among the young people’s attitudes and behaviours that we capture in our study, it is

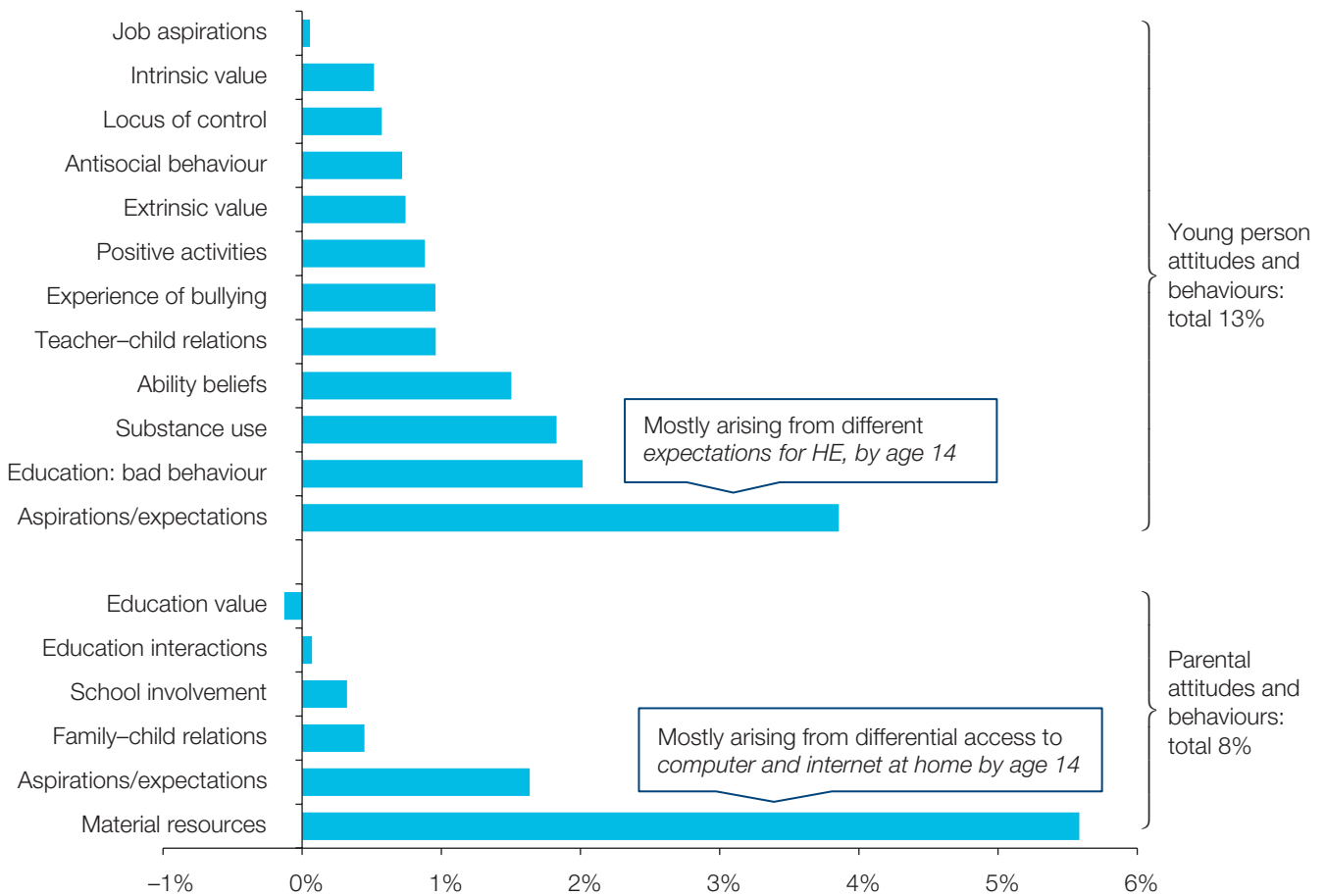
expectations for HE formed by age 14 that make the greatest contribution to the gap in test scores between young people from rich and poor backgrounds; the large decline in poor young people’s HE expectations between ages 14 and 16 (which is negatively associated with educational attainment) also makes a contribution.

Interestingly, the role of HE expectations plays a relatively smaller role in explaining the gap in test scores between children from the bottom and middle SEP groups (see Chowdry *et al.*, 2010), most likely because of the smaller difference in expectations between these groups (see Figure 5.3 above).

Teenage behaviours – including participation in positive activities, and various risky behaviours and problem behaviours at school – also combine to represent an important part of the story. Differences in reported career values and aspirations, on the other hand, have very little role to play in explaining the gap in GCSE attainment between rich and poor children.

Among parents, we find an important additional role for **parental educational expectations and aspirations** (particularly around attendance in HE). We also find that access to a **computer** and to the **internet** in the home is important, especially

Figure 5.6: Further decomposition of direct effects: parent and child attitudes and behaviours



Note: The relative contributions of each set of factors are calculated by multiplying the difference in the proportions of rich and poor with each characteristic by the coefficient estimates from a regression model including all characteristics simultaneously. For more details, see Chowdry *et al.* (2010).

in explaining the attainment gap between young people from the middle and bottom SEP groups (see Chowdry *et al.*, 2010).

Summary and conclusions

In summary, our findings suggest that while policies that work towards raising the attainment of poor children before they reach secondary schooling are likely to be the most successful, policies that aim to reduce differences in attitudes and behaviours between the poorest children and those from better-off backgrounds during the teenage years may also make a significant contribution towards: (a) preventing the gap between the poorest and the richest from widening during secondary school and (b) going some way towards closing the gap.

Factors that stand out as particularly important include expectations for HE, participation in positive and risky behaviours, and material resources in the home such as access to a computer and the internet.

6 An intergenerational picture: evidence from the children of the British Cohort Study

This chapter considers the importance of how skills are transmitted *across generations* for explaining why children from poor families have lower cognitive outcomes than young people from better-off families. We use unique data collected in 2004 on the children of the British Cohort Study. All these children – typically aged around 6 in 2004 – have a parent who was born in April 1970. This ‘cohort member’ parent has been followed from their own birth in 1970, throughout childhood and into adulthood up to the age of 34, when the study of their children was also taken.

This unique data allows us to consider whether parents’ childhood circumstances play any role in explaining why children growing up in poverty have worse educational outcomes than those growing up in better-off families. We build on the analysis in previous chapters, in which we were only able to consider the role of current circumstances in explaining socioeconomic gaps in attainment, by investigating the key attitudes, behaviours and other attributes that are passed on across generations and which perpetuate the cycle of poverty and low attainment.

Our central finding is that there is a very strong correlation between the cognitive development of parents during their own childhood, and that of their children. One strong reason why children from poor families on average have lower cognitive outcomes is because their parents do too. While we cannot hope to disentangle the complex interaction between genetic and environmental factors in determining this link, we do find that the strong connection between the cognitive development of parents and that of their children remains very strong, even after taking a very large number of environmental factors into account, which suggests a genetic component to this link.

As well as this strong cognitive link, we also find evidence for a host of other traits and attributes that are passed from parents to children, and which play a significant role in explaining the cycle between poverty and poor cognitive outcomes. Factors that show a particularly strong intergenerational transmission include:

- attitudes to education: the child thinks that good marks in school are very important, and the parent thinks that university is likely;
- home learning/reading: the parent reads stories to the child every day (pre-school).

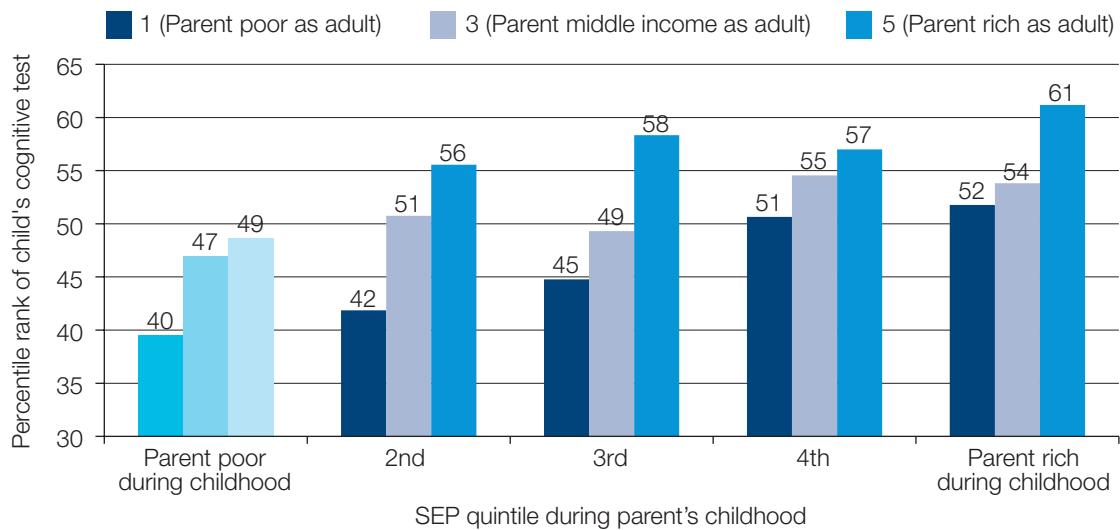
We also find strong intergenerational links in some measures of health and wellbeing, including breastfeeding, maternal depression, and child social and emotional wellbeing, as well as in family structure (particularly, lone parenthood).

What are the cognitive test scores of children whose parents come from poor backgrounds?

Our previous chapters showed that at all ages, children growing up in poverty (defined as those in the poorest fifth of our sample) have lower cognitive outcomes than those growing up in better-off families. Our work using the children of the BCS allows us to extend our analysis back in time, to consider the importance of the conditions experienced by the parents, when they were growing up, in explaining these gaps.

Figure 6.1 sets the scene by summarising children’s test scores by their current SEP (different coloured bars), and by the SEP of their parents when they were growing up in the 1970s and 1980s (across the horizontal axis). It shows that

Figure 6.1: Child cognitive test scores, based on parent's childhood and adult SEP



Note: Authors' calculations using BAS. Our sample includes all children of the BCS aged between 3 and 16 in 2004 for whom we observe a BAS score.

children's test scores are lowest when poverty has persisted across the generations and highest when material advantage has been longlasting. For example, among children in our sample whose parents grew up in the lowest SEP (SEP) quintile during childhood, and who are also to be found in the lowest SEP quintile today (in 2004), the average percentile rank is around 40. This compares to an average rank of 61 for those whose parents were in the richest quintile in their own childhood and today.

More generally, the clear upward steps *within* parents' childhood SEP quintiles illustrate that whatever the parents' childhood circumstances, poverty in the current generation is associated with lower child cognitive development. For example, the very small number of children whose parents grew up in the poorest fifth, but who have made it into the top fifth today, have a higher average rank (49)

than children whose parents grew up in the poorest fifth and are still in poverty today (40). Similarly, the slightly larger number of children whose parents grew up in the richest fifth but have fallen into poverty in adulthood have a lower average rank (52) than children whose parents were in the richest fifth in their own childhood and remain so today (61).

The slightly less pronounced, but still clear, steps up *between* childhood SEP quintiles suggest that poverty in the previous generation also has a lasting impact. For example, children growing up in the richest fifth today, but whose parents were raised in poverty, have a lower average rank (49) than children growing up in the richest fifth today whose parents also grew up in the richest fifth (61).

Table 6.1 provides additional context to these patterns by showing the proportion of children in our sample who fall into different SEP group

Table 6.1: SEP across the generations

Per cent of full sample (% from each childhood SEP quintile)	Parent's adult SEP				
	Poorest	2	Middle	4	Richest
↓ Parent's childhood SEP					
Poorest	8 (42%)	4	4	3	1
2	5	5 (24%)	4	3	2
3	4	4	4 (21%)	5	4
4	3	5	5	5 (23%)	4
Richest	2	3	3	5	5 (27%)

combinations. For example, 8% of children are in the poorest fifth in both childhood and adulthood, and 5% of children can be found in the richest fifth throughout. The additional percentages shown in brackets on the leading diagonal of Table 6.1 highlight the degree of intergenerational immobility in SEP within our sample. They show, for example, that children who grow up in poverty are very likely to be in poverty as adults (42% of children from the poorest fifth grow up to be in the poorest fifth themselves); similarly, 27% of children from the richest fifth grow up to be in the richest fifth themselves. This highlights the high degree of intergenerational immobility for this cohort, particularly among children from the poorest families.

The rest of this chapter goes on to assess how much the transmission of skills and other attitudes and behaviours between parents and their children helps to explain the gaps in cognitive test scores between children from rich and poor backgrounds.

Which skills, attitudes and behaviours are passed down through generations?

The BCS data gives us the unique opportunity to understand which traits and attributes are passed down through generations. Since the children of the BCS cohort members are the main object of our study, we can observe two distinct sets of transmissions, namely in:

- *parenting* attitudes and behaviours – by studying similarities in parenting between the grandparents and the parents of the children of the BCS;
- *children's* skills, attitudes and behaviours – by studying similarities in childhood traits between parents (the BCS cohort members) and their children.

Here we highlight some of the strongest intergenerational links revealed in the study, by showing what are known as *relative risks*. Relative risks tell us whether the probability of a certain event occurring in the second generation is higher if that event also occurred in the first generation.

In our analysis, a relative risk *greater than one* implies that an event is more likely to occur in the second generation if it has also occurred in the first. High relative risks therefore imply a high degree of intergenerational transmission. (A relative risk of less than one would imply that the event is less likely to happen in the second generation if it occurred in the first.)

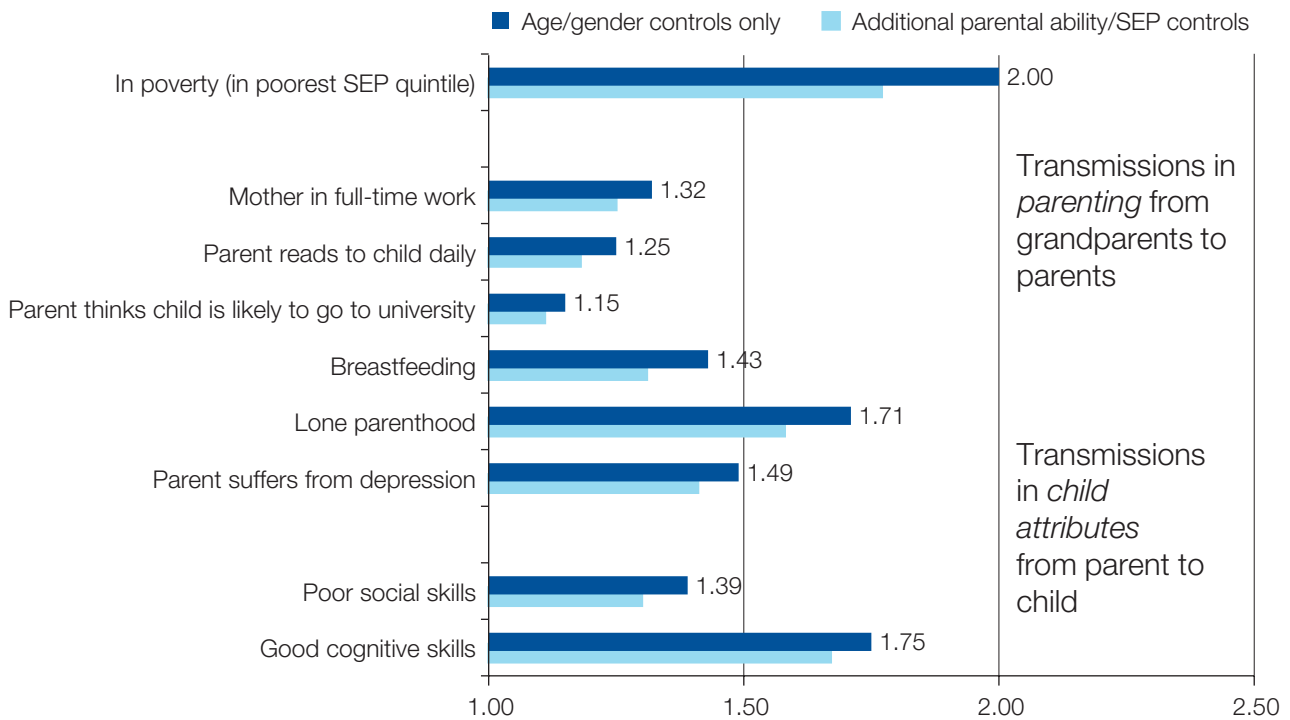
Our starting point in Figure 6.2 is the transmission of socioeconomic status between the generations. This is an aspect of the BCS data that has been very well studied elsewhere, but which nevertheless provides a very important context to our work. We find that cohort members are twice as likely to be in poverty as adults if they were also in poverty as children (where poverty is captured by being in the poorest fifth of the sample), reflecting a strong persistence of poverty across the generations.

Next, we focus on other grandparent-to-parent transmissions (shown in the middle panel of Figure 6.2). We find a number of strong associations in certain aspects of parenting, including the likelihood of being a lone parent and of having a mother in full-time employment; and in health-related characteristics, like being breastfed or suffering from depression. Interestingly, some measures capturing the home learning environment and parental attitudes to education also appear to be quite strongly linked across the generations. For example, cohort members who were read to daily as children are 25% more likely to read daily to their own children, and cohort members whose parents expected them to continue in education beyond age 16 (at age 10) are 15% more likely to expect their own child to go to university.¹⁵

Finally, we focus on parent-to-child transmissions (the lower panel of Figure 6.2). The strongest link that we find is between the cognitive skills of parents and their children. The children of cohort members who were in the top quintile of the cognitive test score distribution at age 10 are 75% more likely (i.e. almost twice as likely) to be in the top quintile of cognitive tests themselves, compared to other children. We also find a significant link between the social skills of parents and their children.

Interestingly, there are many child attitudes and behaviours that do *not* appear in our data to

Figure 6.2: Significant intergenerational transmissions: relative risks



Note: The relative risk is the ratio of the probability of an event occurring in one group to the probability of it occurring in another group. These relative risks are estimated using Poisson regression models with robust error variances in which we control only for the child's age and gender, and for whether the cohort member is the child's mother or father (the results shown by the lighter bars are obtained by adding parental ability and the parent's childhood SEP as additional controls).

be passed on from parents to children, including a wide range of teenage behavioural outcomes, such as smoking, taking drugs, playing truant and getting into trouble with the police. (However it should be noted that the number of teenagers within the study of children on the BCS is relatively small, since the study was conducted when cohort members were aged 34. This means that the sample may not be big enough to pick up on such transmissions, if they exist.)

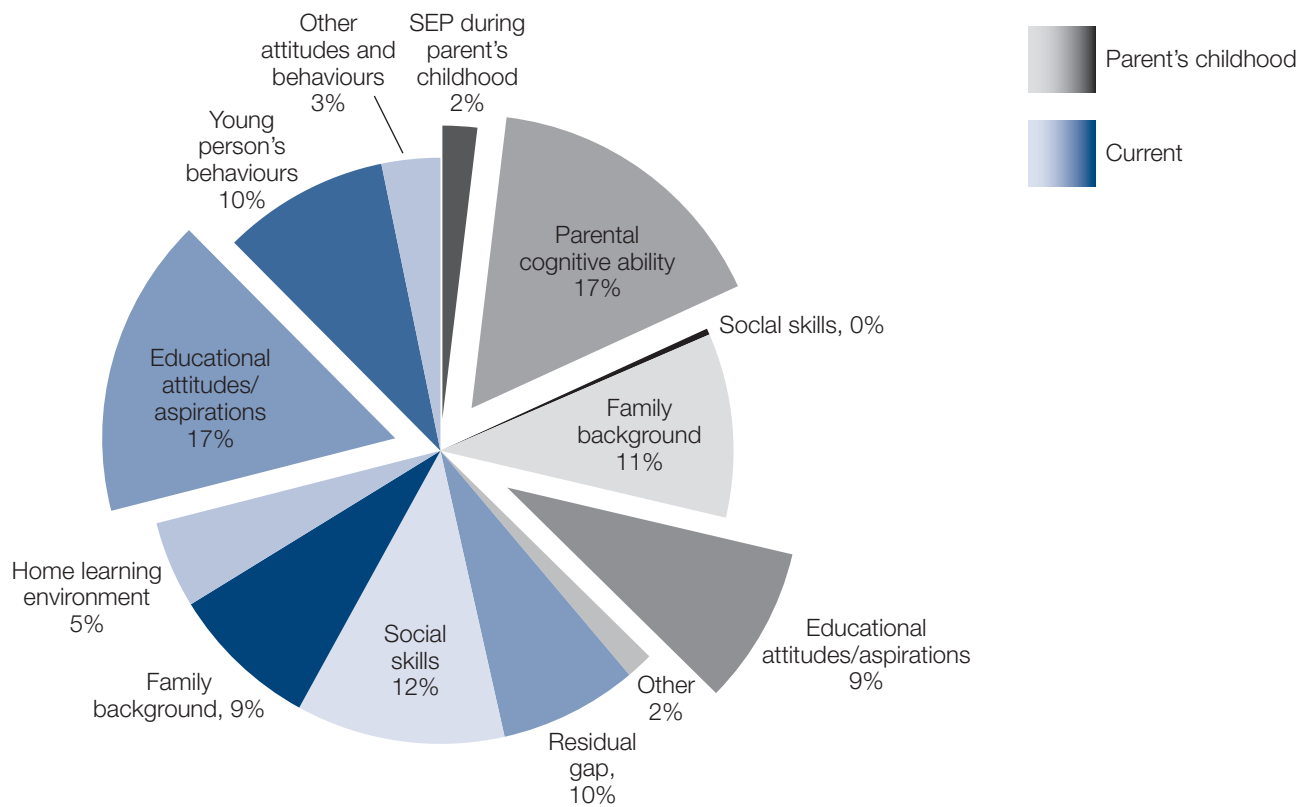
Importantly, we have found that all of the significant transmissions we have shown – in terms of both parenting behaviours and childhood characteristics – do not just reflect the strong intergenerational transmissions in economic status and cognitive abilities that we have already discussed. This is because all of these statistical associations still hold, even when parents' cognitive ability and socioeconomic status during childhood are controlled for our model (shown using the lighter bars in Figure 6.2).

Explaining why poor children have lower test scores: an intergenerational analysis

In this section we directly assess which factors help to explain why children from poor backgrounds tend to achieve lower test scores than those from better-off backgrounds. To do this we perform a 'decomposition' analysis similar to that shown in previous chapters. The unique contribution of this chapter is in understanding the importance of attributes and circumstances of parents, captured long before their children were born, in explaining this cognitive gap.

The starting point for this analysis is the 'raw' gap in cognitive test scores between children from the richest and poorest SEP groups, of 14.1 percentile points. Figure 6.3 shows how we decompose this raw gap into the relative contributions of different groups of factors in our model, which we divide very broadly into those related to the cohort member parent's own childhood (in grey), and those relating to that of their children (in blue). These relative contributions

Figure 6.3: Explaining the gap in cognitive test scores between children who grow up in rich and poor families: decomposition analysis



Note: The contributions of each set of factors are calculated by multiplying the difference in the proportions of rich and poor with each characteristic by the coefficient estimates from a regression model including all characteristics simultaneously. The way in which missing data is treated here differs slightly from the way in which it is treated in the other chapters in this report. For more details, see Crawford *et al.* (2010).

are calculated by multiplying the difference in the proportions of rich and poor children with each characteristic by the coefficient estimates from a regression model of child ability that includes all characteristics simultaneously.¹⁷

This analysis shows that the direct effect of circumstances from parents' childhoods explains nearly 40% of the gap in cognitive test scores between children growing up in rich and poor families. Of particular note here is the importance of the following:

- **Parental cognitive ability:** Nearly *one fifth* (17%) of the gap is explained by parents' cognitive ability at ages 5 and 10; moreover, this is the contribution that remains even after taking into account many of the channels through which cognitive ability might operate, such as parents' subsequent educational attainment, adult SEP, attitudes to education, and so on. This relationship serves to highlight

the intergenerational cycle of poverty and low attainment: parents who grew up in poverty themselves performed poorly in cognitive tests as children relative to those from richer backgrounds, and this pattern is then repeated in the next generation.

- **Educational attitudes and aspirations:** 9% of the gap is explained by the apparent direct effects of grandparents' and parents' attitudes to education while the parent was a child. Of particular importance here are the expectations of the grandparents regarding the parents' likelihood of staying on at school after 16, and the parents' self-perceived maths ability at age 16. These contributions will be reinforced by any indirect effects, such as the influence of these attitudes on parents' subsequent educational outcomes, or on educational attitudes and aspirations in the next generation. (As we showed in the last section, there are

significant intergenerational links between some of these attitudes.)

It is interesting to note, however, that **parents' social skills**, as captured in childhood at ages 5 and 10, do not appear to make any direct contribution to the gap in cognitive test scores between children from rich and poor backgrounds.

Among the circumstances in the current generation that are important for explaining the gap in cognitive test scores between children from rich and poor backgrounds, we note that differences in **educational attitudes and aspirations**, the **home learning environment**, young people's **risky and positive behaviours** and young people's **social skills** (measured by a Strengths and Difficulties score) between them account for 44% of the gap in cognitive test scores between children from rich and poor backgrounds. Factors within these groups of particular importance are the parent's assessment of the likelihood that the child will attend university; whether or not the child wants to stay in education beyond age 16; whether or not the child regularly reads for enjoyment; and whether or not the child smokes.

Overall, attitudes and behaviours in the previous generation account for around 40% of the gap in test scores between children from rich and poor backgrounds. This suggests that while circumstances in the current generation are more important in explaining why children growing up in rich families tend to have higher cognitive test scores than children growing up in poor families, the importance of intergenerational influences

in perpetuating the cycle of poverty and low attainment should not be underestimated.

Influences on cognitive test scores among siblings within the same family

We finish this chapter by considering what we can learn about the factors that influence cognitive development from studying differences among *siblings* within the same family. Our ability to answer this question is unique to our work on the BCS in this report, because the follow-up of cohort members in 2004 contains information on *all* of the children of a select group of parents. In particular, we are interested in whether siblings within the same family, who experience different home environments or who have different attitudes and behaviours, also display differences in their test scores.

Of course, even when analysing differences within families one needs to be careful in assuming a particular direction of causation for the findings – for example, it may be more likely that parents are responding to differences in ability when forming their expectations about each of their children's university attendance, rather than that differential expectations somehow cause these differences in cognitive test scores within families.

In Table 6.2 we show results from a *within-family* regression analysis (the middle column compares results from a more standard 'across families' approach).

Table 6.2: Analysis of siblings: selected influences on cognitive test scores

	Full model (across families)	Within-families model
Child attends nursery	+	+
Child attends private school	+	+
Parent thinks child is very or fairly likely to go to university	+	+
Child's Strengths and Difficulties score	+	+
Child reads for enjoyment several times a week	+	+
Child has tried smoking	-	-

Note: Regression model controls for full set of characteristics in the model (detailed in Figure 2.1, Chapter 2). No entry in the table indicates that these variables are not statistically significant in a particular model.

Table 6.2 shows that:

- Siblings who go to nursery and those who attend a private school tend to have higher cognitive test scores than siblings who do not go to nursery or attend a private school.
- Siblings whose parents think they are very or fairly likely to go to university tend to have higher test scores than siblings whose parents do not expect them to go to university.
- Siblings who read for enjoyment tend to have higher cognitive test scores than siblings who do not.
- Siblings who have good social skills (measured by an inverted Strengths and Difficulties score) tend to have higher cognitive test scores than siblings who do not.
- On the other hand, siblings who have tried smoking do not end up with lower cognitive test scores than siblings who have not. Again, this is in contrast to our analysis comparing children from different families, which suggested that comparing across families, children who smoke have lower test scores.

factors observed in traditional studies, the analysis in this chapter suggests that parents' own cognitive skills, and other lasting influences from their own childhoods, provide an important part of that explanation.

Summary and conclusions

In summary, our analysis highlights that the link between growing up in poverty, and low cognitive test scores among children, has very long roots. It is striking that it is in families where poverty has persisted across the generations where children's test scores are the lowest. Our analysis has highlighted the importance of other influences from parents' childhoods for explaining the gap that we observe today between children from rich and poor backgrounds. Of particular note is the strong link between cognitive skills across generations, as well as the importance of educational attitudes and aspirations that are also passed on across generations.

While previous chapters of this report, especially Chapter 3 on early childhood, highlighted that a large part of the cognitive skills gap between rich and poor children remained unexplained by

7 Conclusions

Throughout this report we have explored how children from poor backgrounds typically show lower educational attainment compared to children from better-off backgrounds, and why this gap widens throughout much of childhood. We began our story at the very earliest stages of childhood, and followed up young people until the age of 16, when they potentially obtained their first formal qualifications. Our main analysis split childhood into three periods, broadly conforming to pre-school, primary and secondary phases of education, recognising that cognitive development and attainment within each period builds on learning in the previous one(s).

Our report has shown a wealth of simple evidence that from the earliest of ages, poorer children experience much less advantageous environments at home than children from better-off backgrounds, and that differences in these environments have a strong association with poor children's lower cognitive development in early childhood, and progressively poorer academic attainment through school. For instance, a quarter of the gap in GCSE results between children from rich and poor families is associated with these differences in attitudes, beliefs and behaviours.

The differences we have found cover many different aspects of home life, from home learning environments and parenting styles at a young age, to parents' aspirations and expectations for their child's future education during primary and secondary school, measures of family closeness, and the availability of material resources such as a computer and the internet at home during the teenage years. At the same time, we have also found that children from poor families typically display many more behavioural problems, at all ages, than children from better-off backgrounds.

Our analysis of the BCS also highlighted the possibility of a significant passing of genetic capabilities from one generation to the next. This is an important part of our story: one fifth of the gap between richest and poorest is explained by a direct link between the cognitive skills of the parent

and child, which is unmediated by the rich set of environmental factors observed in our surveys.

The big question arising from our work is what it can tell us about policy. Will improved parenting skills in the very early stages of life lead to better outcomes at school, many years later? Will raising maternal aspirations for education, young people's self-esteem and ability beliefs have a similar effect? By the teenage years, can improving young people's own aspirations, reducing their involvement in risky behaviours and encouraging positive behaviours help to close the gap between the poorest children and those from better-off backgrounds, and hence help to break the cycle of poverty across the generations?

Before trying to answer these policy questions in more detail, we first sound a strong note of caution. While our models generally include prior attainment and long-run background factors as controls – helping us to isolate the effects of specific age-related factors – our research is nevertheless based on detailed statistical correlations, rather than robust trials. This means that we have not established robust causal relationships from this work. More generally, the measures of aspirations, attitudes and behaviours that we include in our model are likely to be indicative of wider processes operating within families and peer groups, and there are likely to be other unmeasured differences across families which our measures are partially capturing. The possibility of correlated unobservable characteristics, and reverse causation, mean that taking our findings purely at face value could lead us to misplaced policy conclusions (as we discussed in our methods section in Chapter 2).

Moreover, many of the aspects of parental and child attitudes and behaviours that we have considered are strongly related to each other, hence it is not always appropriate to isolate one of these factors as a focus for intervention, when it might reflect a broader set of attitudes and beliefs that are not all easily measured independently.

Putting this important point to one side for a moment, the evidence presented offers two major areas in which policy may make a contribution to reducing educational inequalities:

1. Parents and the family home

- improving the home learning environment in poorer families (e.g. books and reading pre-school, computers in teenage years);
- helping parents from poorer families to believe that their own actions and efforts can lead to higher educational outcomes;
- raising families' aspirations and desire for advanced education – from primary schooling onwards;

2. The child's own attitudes and behaviours, and their approach in taking forward their past experiences into learning

- reducing children's behavioural problems; improving coping and management capabilities for risky behaviours, conduct disorder and ADHD;
- helping children from poorer families to believe that their own actions and efforts can lead to higher educational outcomes;
- raising children's aspirations and desire for advanced education – from primary schooling onwards;

Schools could also arguably be doing more to reduce inequalities in attainment between rich and poor, and potentially have a very significant role to play in counteracting the effects of the big inequalities in family backgrounds and home environments that our study has revealed. Relevant policies are likely to include:

- how funds are allocated towards pupils from the poorest backgrounds;
- direct teaching support provided to children when they start to fall behind.

Of course, these broad areas do not operate in isolation from each other – each having extremely important feedbacks on the others.

How successful are existing UK government policies based around these broad areas in closing the attainment gaps between rich and poor?

First it should be noted that there has been a marked shift in policy emphasis in recent years away from a narrower focus on educational outcomes, and towards the wider emotional and social wellbeing of children. The creation of the Department for Children, Schools and Families to replace the previous Department for Education and Skills has been one hallmark of this shift in approach, while the development of the Every Child Matters agenda and the Children's Plan has formalised this approach.¹⁸

Boxes 7.1 to 7.3 outline some of the major policy initiatives currently under way in England and/or the UK that are aimed at improving (i) parenting and the early childhood caring environment (including early education and childcare) (Box 7.1), (ii) children's own attitudes and behaviours during the schooling years (and thereby indirectly, their school attainment) (Box 7.2) or (iii) attainment among 'at-risk' children in schools (Box 7.3).

In order to understand how successful the policies outlined in Boxes 7.1 to 7.3 already are at reducing the gap in school attainment between rich and poor children, we need to address two key questions:

- Are these factors – namely early environments, attitudes and aspirations, etc. – malleable, and have these policies actually been successful at improving them?
- Do such improvements raise poor children's attainment in the way that is hoped?

Box 7.1 focuses on programmes designed to influence parenting, the home learning environment, and early years' childcare and education provision. Sure Start is now a national programme that aims to reach all families, with more intensive support for the more needy. The other interventions outlined in Box 7.1 are more targeted on struggling families. These programmes have a range of positive evaluation evidence behind

Box 7.1 Some key parent-centred policy interventions in the UK aimed at improving the early childhood caring environment, and the social and emotional wellbeing of at-risk children

Sure Start (early education provision, Sure Start Local Programmes and Children's Centres)

This is probably the biggest, most overarching policy initiative aimed at improving outcomes for pre-school children from deprived backgrounds in England. Sure Start covers a wide range of programmes, both universal and those targeted on particular local areas or disadvantaged groups within England, combining early education, childcare, health and family support. It includes free part-time early education for all 3- and 4-year-olds, and Children's Centres – which are community-based centres, providing integrated services for families of children under 5.

Family Nurse Partnership

This is a new, intensive home visiting programme for first-time 'at risk' mothers from the first trimester of pregnancy until the child is aged 2. The project is currently being tested in 30 pilot sites in the UK, and is run jointly by the Department of Health and the DCSF. It consists of activities and discussions led by a nurse around healthier lifestyles, improved parenting skills, and becoming self-sufficient, plus free transport to ante-natal appointments, and screening and referral services for child appointments. Robust evaluation from the US programme (known as the Nurse Family Partnership) has shown positive long-term effects on children's behavioural and cognitive outcomes, while the UK model has been shown to have reasonably high fidelity to the US model.

Incredible Years Parenting Programmes (also Teacher and Child Programmes)

The Incredible Years consists of a set of programmes designed to prevent and reduce aggression and behaviour problems in young children, and to promote children's social, emotional and academic competence. It has been adopted locally in a number of settings in the UK, often as part of the Sure Start

programme – notably in North Wales (where extensive evaluation has taken place). The Basic Parenting Programme is made up of weekly clinics running for between 12 and 28 weeks, covering topics such as praise and reward, play and limit-setting. It has also been trialled in conjunction with a number of early literacy programmes (such as Pause Prompt Praise). Evaluation findings have generally been both robust and positive, finding improved positive parenting behaviours, decreased problem child behaviour and increased child positive behaviour.

Family Intervention Projects

Family Intervention Projects (FIPs) are a new programme – rolled out nationally in April 2009 – targeting small numbers of families with very severe behavioural problems (often where housing security has been threatened as a result). It is run by the DCSF's Respect Task Force and the Department for Communities and Local Government. On referral to the project, families typically have a web of complex problems including mental and physical health problems, substance misuse and domestic violence. Each family is paired with a key worker who draws up a contract between themselves and the family. FIPs can run in three ways. The most common is as an outreach service where families stay in their homes and meet frequently with the key worker. The second way is for families to move into a community with close FIP supervision and support and the final and strongest implementation sees families move into a FIP centre where they live 24 hours a day with FIP staff. All families have access to finance management, parenting skills training (sometimes in the form of the Incredible Years Basic Parenting Programme; see above), behaviour management and direction to other services. Early evaluation evidence – focused just on those families who were successful enough to complete the project – has been positive (White *et al.*, 2008).

them. The early evidence on Sure Start among children at age 3 was rather mixed (NESS Research Team, 2008), although we understand that the evidence for age 5, which will soon be available, is more encouraging. More targeted programmes, by their nature, are more straightforward to evaluate, and there is clearer, positive evaluation evidence on some of these. For example, the introduction of the Family Nurse Partnership in 30 pilot sites in the UK – aimed at improving very early parenting skills, and parent and child health – is backed up by randomised controlled trials showing the effectiveness of this programme in the US in improving children’s long-term behavioural and cognitive outcomes (up to 13 years after involvement in the programme) (see Olds *et al.*, 1998). The parenting elements of the Incredible Years Programme, operating in various guises around the UK, is another well-evaluated parenting programme showing success in improving child behaviours among children at a young age (see Hutchings *et al.*, 2007; Bywater *et al.*, 2009). Some other parent-centred programmes, while not yet subject to fully robust outcome evaluations, appear quite promising: these include Family Intervention Projects, which address the problems of a small number of families with severe behavioural problems, tackling what is typically a complex web of mental and physical health problems, substance misuse and domestic violence (White *et al.*, 2008).

Three features of the parenting-based work discussed above are worth drawing out here.

First, the majority of parenting support programmes is aimed at pre-school aged children. While there is a clear and obvious reason for this, our research here highlights the ongoing potential for improved parenting to reduce inequalities in child development, certainly into the primary years and perhaps to a lesser extent, into the secondary school period.

Second, the best evidence we have on programmes being successful is for high intensity (and costly) programmes concentrated on the most needy families and children. While intensive programmes that focus on helping small numbers of children most in need tend to have the strongest evidence base behind them, educational disadvantage affects a very large number of children from low-income families, but with lower

intensity than those at the extreme, and it may be that policy needs to focus more on these (although Sure Start is a major exception here).

Finally, the evaluation evidence tends to be clearer about the positive impact of these programmes on children’s social and emotional wellbeing, and health, but is generally much less clear about their impacts on children’s long-term cognitive development, and educational attainment. While both are clearly important, if one is trying to reduce *educational* inequalities then this latter point is clearly a relevant concern. The question mark over whether such programmes improve cognitive development, and raise educational attainment, chimes with our own findings. For example, in Chapter 3 we highlighted that although children from poor families typically experience much less advantageous early caring environments than children from better-off families, most aspects of the home environment (except for specifically the home *learning* environment) were not directly responsible for the big gaps in cognitive development we sought to explain. However, they were important for explaining differences in children’s social and emotional wellbeing.

Box 7.2 discusses a number of mainly school-based programmes aimed at raising children’s aspirations and tackling behavioural and emotional issues. For example, one major voluntary programme for primary and secondary schools is the Social and Emotional Aspects of Learning (SEAL), which emphasises the importance of social skills such as empathy, self-awareness and self-regulation. AimHigher seeks to raise aspirations for HE among young people, while various programmes under the National Behaviour and Attendance Strategy seek to improve behaviour within the school context; Aiming High and, within this, Extended Schools Services, aim to promote youth engagement in positive activities. Many of these programmes – such as SEAL and various elements of the government’s strategy towards behaviour and attendance – emphasise the importance of the whole-school ethos in improving young people’s attitudes and behaviours, as well as individual- or small-group work.

Our reading of the evidence on these types of programmes is that, in general, their effectiveness is much less robustly established than the

Box 7.2 Some key (mainly school-centred) policy interventions in the UK aimed at improving aspirations, attitudes and behaviours among children of school age

Social and Emotional Aspects of Learning (SEAL)

This is a nationwide government-funded voluntary programme operating in both primary and secondary schools (but predominantly primary), which aims to promote five social and emotional skills that are thought to be instrumental for effective learning: self-awareness, self-regulation (managing feelings), motivation, empathy and social skills. The programme uses a community-based whole-school approach, combined with small-group work (lasting half a term) for children identified as requiring additional help. SEAL in primary schools has been evaluated in two large-scale DCSF-funded reports (Hallam *et al.*, 2006; Humphrey *et al.*, 2008), which revealed some positive, but overall mixed results. It has also been evaluated in a number of less formal evaluation studies undertaken by participating schools, which have typically been more positive in their tone (Pullinger, 2007).

AimHigher

AimHigher aims at widening participation in HE and is an umbrella term for a set of initiatives – undertaken both at a national and a local level – aimed at improving the awareness, aspirations and attainment of young people typically under-represented in HE. Activities undertaken are focused at secondary school children and typically include campus visits, school/college-based interventions including those aimed specifically at gifted and talented pupils, and summer schools. One element of AimHigher to have been formally evaluated is Excellence Challenge (which involved both outreach with universities and an element focusing specifically on gifted and talented young people). The evaluation found strongly positive impacts both on aspirations for HE and on GCSE attainment (Emmerson *et al.*, 2005).

National Behaviour and Attendance Strategy

This is the government's national strategy around improving behaviour and attendance in schools; within this umbrella there falls a wide range of locally

implemented approaches, which includes schools working in partnership to improve behaviour and tackle persistent absence. The Behaviour Improvement Programme (BIP) was one specific intervention within this umbrella, which was subject to a formal evaluation that found positive benefits on young people's school attendance (Hallam *et al.*, 2005). However, other formal evaluation work on the BIP based on the LSYPE found no discernible impacts of the programme on young people's likelihood of truancy, nor on any other of a detailed set of attitudes and behaviours or on attainment at Key Stage 3 (Chowdry *et al.*, 2009).

Aiming High for Young People

Aiming High is the government's ten-year strategy aiming to increase young people's participation in constructive leisure activities. Activities within the strategy are aimed at, among other things, improving youth services and access to them. An important element of the Aiming High strategy is around Extended Schools (see further below). While there has been piecemeal evaluation of some elements of the strategy, such as the national evaluation of the Positive Activities for Young People (DCSF, 2006), there has been no overall evaluation of the effectiveness of the approach.

Extended Schools Services

Under the Extended Schools Services (ESS) programme, councils set up activities in and around schools for the evenings, weekends and during school holidays. Services offered include study support, play/recreation, sport, music, arts and crafts and other special interest clubs, volunteering and business and enterprise activities, childcare, parenting support, specialist services such as speech and language therapy, and community access to facilities including adult learning, information and communication technology and sports facilities. While the formal national evaluation of ESS is yet to report, evaluation of a predecessor programme found some evidence for positive impacts on young people's behaviour and learning (Cummings *et al.*, 2007).

parenting-focused programmes we discussed above. As such, their benefit remains unproven. One exception is AimHigher (most specifically, the Excellence Challenge element) where robust evaluation findings are positive. Targeted at young people in urban, deprived schools, it was found that one school year's exposure to the programme in Year 11 (age 15–16) led to pupils scoring 2.5 points higher at GCSE (equivalent to 2.5 grades improvement on the current scale) and being 3.9 percentage points more likely to report that they intended to participate in HE (Emmerson *et al.*, 2005). While AimHigher thus appears very useful, it starts in the secondary phase of schooling. In this report we find that aspirations are also an important potential influence on attainment even by the age of 11 (see Chapter 4, on the primary schooling years), suggesting that activities aimed at raising aspirations at primary school might also be valuable.

By contrast, our reading of various evaluations of SEAL suggests that this approach is as yet unproven – since in general clear benefits have not been very robustly established. For example, in one independent evaluation that involved a control group design (Humphrey *et al.*, 2008), statistically significant positive impacts were found for some social and emotional outcome measures, but many more outcomes did not appear affected by the interventions, and indeed there were a number of important outcomes that appeared adversely affected by some interventions. One intervention – ‘Going for Goals’ – did show a more consistent positive impact on the children involved, although no impact was found on young people's motivation, the main aspect of learning that is supposedly addressed by this intervention. Additionally, to our knowledge, this (or any other) programme's impact on young people's sense that their destiny can be shaped by their own actions (locus of control) has not been tested – although the findings from this report suggest that this may be important.

Stronger evidence is also required on the effectiveness of the government's strategies on behaviour improvement (the National Behaviour and Attendance Strategy) and on positive activities (the Aiming High strategy, including Extended Schools services). Here we know less than we should both on the effectiveness of these strategies

for improving adolescent behavior and also on whether they have any impact at all on raising attainment.

Box 7.3 discusses some more intensive initiatives and teaching programmes in schools designed to directly improve the learning outcomes of children and young people in particular need of help, many of whom are from disadvantaged backgrounds. These initiatives include Special Educational Needs (SEN) provision, and very intensive programmes in primary school such as Every Child a Reader, Every Child Counts and Every Child a Writer. While the basic effectiveness of programmes such as Reading Recovery – the intervention at the core of the Every Child a Reader programme – in helping young children struggling to read to catch up with their peers has certainly been robustly established in a number of different studies (Shanahan and Barr, 1995), whether such gains are sustained in the longer term, and the *cost-effectiveness* of these very expensive, intensive one-to-one teaching programmes, have both been publicly asserted (KPMG, 2009) and publicly questioned (Policy Exchange, 2009). Other programmes such as the literacy and numeracy hours have also been backed up by positive evaluation findings, which suggested that positive benefits are found more among children from low-income families (Machin and McNally, 2004).

One set of issues not touched upon yet in this policy discussion is whether (i) the level of resources channelled towards pupils from low-income backgrounds in schools, (ii) the funding mechanisms for delivering these and (iii) the school structures into which such resources are channelled, are likely to be effective in reducing the educational attainment gap between rich and poor children. While a detailed discussion of these big topics is beyond the scope of this report, it should be noted that funding to schools is biased in favour of more deprived local education authorities and to some degree this is passed onto the schools serving the poorest children within those local education authorities. However, there is some question as to whether the full value of this extra support does indeed benefit the poorest children,¹⁹ while both the major opposition parties (the Conservatives and Liberal Democrats) are suggesting the creation of a ‘disadvantaged pupil

Box 7.3 School-based policies and reforms focused directly on improving attainment among poor or at-risk children (targeted help for children most at need)

Every Child a Reader, and Every Child Counts

These programmes, currently being rolled out in schools nationwide, involve very intensive reading and numeracy interventions provided to children aged 5 and 6, who are struggling the most to read and count at an early stage in their schooling. Every Child a Writer is also being developed, and is designed to improve the writing skills of slightly older primary school children. The 'Every Child' model has at its core intensive daily one-to-one support from specially trained teachers. Existing evaluations of Reading Recovery, the programme at the core of Every Child a Reader, have found big positive impacts on children's reading skills (Shanahan and Barr, 1995), however some studies have questioned the cost-effectiveness of the programme – since it requires considerable upfront cost (in the anticipation of large long-

run returns) (Shanahan and Barr, 1995).

Special Educational Needs provision

Around one in five pupils in England benefit from SEN programmes, in which schools identify pupils with learning difficulties, and then adapt their teaching to their specific learning difficulties. Children covered within SEN programmes include those so classified due to hyperactivity and emotional difficulties, as well as those with other problems with learning. While robustly assessing the impact of SEN provision on all who receive it is methodologically problematic, recent formal evaluation work has found no discernible net impact on school attainment for those recognised with moderate (as opposed to serious) special needs (see Keslair *et al.*, forthcoming).

premium', which would involve direct school payments of greater value in respect of children from poor backgrounds (or children classified as having SEN).

Another set of policies of particular note are those that are designed to incentivise or force young people (particularly those from poor backgrounds) to remain longer in formal education. Education Maintenance Allowances (introduced nationwide in 2004) have been designed to encourage more young people from low-income backgrounds to remain in full-time education beyond 16, through a means-tested payment of up to £30 per week, made to young people aged 16–18. Robust evaluation evidence suggests that the financial incentive works: there have been positive impacts on staying-on rates, retention and achievement (see Chowdry *et al.*, 2007b). Yet bigger changes in this area are imminent, with the forthcoming raising of the minimum education and training participation age. New legislation means that in academic year 2013/14, young people will

have to remain in some sort of education and training until the age of 17, and in 2014/2015 until the age of 18. This will largely impact on young people from poorer backgrounds, who are the most likely to leave school and training before 18 under the current system. While previous legislation to increase the *school* leaving age has generally been shown to raise attainment and have positive economic returns, it remains to be seen whether this particular extension, which increases the minimum leaving age by a further two years, and also includes jobs with formal training, will have a similar effect.

Our final set of concluding comments returns to the evidence produced for this report, assessing the role of attitudes and behaviours, broadly defined, in explaining the gap in educational outcomes between young people from rich and poor backgrounds. In trying to interpret this evidence, the authors have veered between states of optimism, that policy can be used to close the attainment gaps between rich and poor,

and pessimism, that such gaps will be largely unresponsive to policy. However, a reasonably optimistic take on our results would suggest that the search for robust policy interventions that can shift attitudes, aspirations and behaviours is unlikely to be in vain, and that, for example, 25% of the attainment gap between rich and poor children at GCSE level could be closed if policy were able to even out differences in teenagers' attitudes, aspirations and behaviours. Such a reduction in the attainment gap between rich and poor would represent a significant achievement and would make a real difference to the lives of children. Moreover, sustained policy interventions starting from the early years (or even prior to birth) through to the teenage years, could be even more effective.

List of abbreviations

ADHD	attention deficit hyperactivity disorder
ALSPAC	Avon Longitudinal Study of Parents and Children
BAS	British Ability Scales
BCS	British Cohort Study
BIP	Behaviour Improvement Programme
DCSF	Department for Children, Schools and Families
EPPE	Effective Pre-school and Primary Education project
ESS	Extended Schools Services
FIP	Family Intervention Project
FSM	free school meals
GCSE	General Certificate of Secondary Education
HE	higher education
LSYPE	Longitudinal Study of Young People in England
MCS	Millennium Cohort Study
NPD	National Pupil Database
SEAL	Social and Emotional Aspects of Learning
SEN	Special Educational Needs
SEP	socioeconomic position

Notes

- 1 Each of the datasets we use has a somewhat different geographical coverage: the MCS covers the whole of the UK, the ALSPAC covers just the Avon area, the LSYPE covers England and the sample for the BCS was drawn from births in Great Britain.
- 2 <http://publications.dcsf.gov.uk/default.aspx?PageFunction=productdetails&PageMode=publications&ProductId=CM+7595>
- 3 www.conservatives.com/~media/Files/Green%20Papers/Schools_Policy_Paper.ashx?dl=true
- 4 http://s3.amazonaws.com/ld-migrated-assets/assets/0001/0387/89_-_Equity_and_Excellence.pdf
- 5 Each of the datasets we use has a somewhat different geographical coverage: the MCS covers the whole of the UK, the ALSPAC covers just the Avon area, the LSYPE covers young people in England, and the sample for the BCS was drawn from births in Great Britain.
- 6 More detailed analyses of each of these datasets are provided in the set of working papers accompanying this report, which are available at www.ifs.org.uk/projects/8/257
- 7 See the four companion working papers for full results: Gregg and Washbrook, 2009, Chowdry *et al.*, 2010, Crawford *et al.*, 2010 and Dearden *et al.*, 2010.
- 8 Shown in our companion working paper (Dearden *et al.*, 2010).
- 9 The gap in cognitive outcomes between children from different socioeconomic backgrounds is very similar when measured according to a number of other measures of cognitive development. For further details see our companion working paper (Dearden *et al.*, 2010).
- 10 For more details, see Dearden *et al.* (2010).
- 11 For more details, see Gregg and Washbrook (2009).
- 12 We do not observe actual higher education participation among the LSYPE cohort yet, but instead use figures on higher education participation that are derived from linked administrative data combining individuals' school, and higher education records among two cohorts who sat their GCSEs in 2001–02 and 2002–03. This means that they are slightly older than the LSYPE cohort, who sat their GCSEs in 2005–06. It should also be noted that the deprivation quintiles are defined in a slightly different way in the administrative data, compared to the measures we have constructed using the LSYPE data.
- 13 For more details, see Chowdry *et al.* (2010).
- 14 In Chapters 3 and 4 we showed that family background factors have a greater influence on the gap in earlier test scores.
- 15 A significant connection between parents' educational expectations still holds across generations once we control in our model for whether or not the cohort member actually stayed on in education at 16. This suggests that the connection we have found is not driven solely by actual educational outcomes.
- 16 For more details, see Crawford *et al.* (2010)
- 17 For more details, see Crawford *et al.* (2010).
- 18 For more details about Every Child Matters and the Children's Plan, see www.dcsf.gov.uk/everychildmatters/about/
- 19 School funding per pupil in England has nearly doubled in real terms since 1996–97 (see Chowdry *et al.*, 2007a).

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Appendix

Influences on cognitive ability at different ages

In this Appendix we provide further information on the influences on cognitive development at each of the ages covered by our study. Our findings will be of general interest to the reader, and also provide an important context to our main analysis, which explains how these factors contribute to the gaps between rich and poor, presented in the main chapters of this report.

Note that it is where the influence of specific factors are both big enough, and where they differ significantly between rich and poor children, that they become important in explaining the gaps between rich and poor that make up the main body of this report.

The results shown are based on simple multivariate regression models in which the dependent variable is a child's cognitive test score at a particular age. We present results from 'fullest specification' of these regressions, where *all* the factors in our model are controlled for together.

In the tables below, '+' indicates a statistically significant positive association, '-' indicates a significantly negative one and no marking indicates that the estimated regression coefficient is not statistically significant.

What influences cognitive ability at ages 3 and 5?

Based on our analysis of the MCS, Tables A1 and A2 provide a summary of regression results, from multivariate regressions in which the dependent variable is a child's test score at the ages of 3 and 5, respectively.

At the age of 3 (Table A1) we find the following:

- **Family background and demographics:** Boys have significantly lower cognitive development than girls at age 3. Father's employment, mother's age and fewer older siblings are all positively associated with

cognitive development at the age of 3. Interestingly, once we control for all the other influences in our model, there is no negative effect of lone parenthood on cognitive development at age 3.

- **Family interactions:** Relationship problems and conflict problems between mother and child are both negatively associated with cognitive outcomes, while interviewer-assessed measures of mother-child closeness are positively associated with cognitive test scores.
- **Health and wellbeing:** Birth weight and gestation length are both positively associated with test scores at age 3. Controlling for all the other factors in our model, length of breastfeeding and whether the mother suffered from post-natal depression are not significantly associated with cognitive outcomes at age 3.
- **Home learning environment:** We find a strong positive association between measures of the home learning environment at the age of 3, and an additional significant effect of reading to the child every day on test scores at the age of 3.
- **Parenting styles and rules:** Regular bedtimes at age 3 are positively related to test scores at this age, but regular mealtimes are not, once all the other factors in our model have been controlled for.

At the age of 5 (Table A2), we find a fairly similar set of influences on cognitive development as at age 3, although it is interesting to note that many of the factors that we found to be important for explaining cognitive ability at the age of 3 are only important at age 5 in models that do not control for ability at age 3 (i.e. column 1, but not column 2 of Table A2). This suggests that their positive impact at age 5 is derived only *via* their effects on earlier childhood ability. Examples of these include the effects of birth weight, mother-child closeness at 3 and the home learning environment at age 3.

By contrast, factors that have a significant association with age 5 outcomes, even after ability at age 3 has been taken into account,

Table A1: Selected influences on cognitive ability at age 3

	BAS score
Family background and demographics	
Male child	–
Mother worked at one of waves	
Father worked at one of waves	+
Mother's age at birth	+
Lone parent	
Number of siblings at age 3	
Number of older siblings at age 3	–
Family interactions	
Mother–child relationship problems	–
Mother–child conflict problems	–
Interviewer-assessed measure of closeness	+
Health and wellbeing	
Age at which breastfeeding stopped (weeks)	
Gestation length in days	+
Birth weight (kg)	+
Mother suffered from post-natal depression	
Home learning environment	
Home learning environment quintile (age 3)	+
Read to every day at age 3	+
Parenting style/rules	
Regular bedtimes at age 3	+
Regular mealtimes at age 3	

Table A2: Selected influences on cognitive ability at age 5

	Not controlling for prior ability	Controlling for prior ability
Family background and demographics		
Male child		+
Mother worked at one of waves		
Father worked at one of waves		
Mother's age at birth	+	+
Lone parent		
Number of siblings at age 5		
Number of older siblings at age 5	-	-
Family interactions		
Mother-child relationship problems	-	-
Mother-child conflict problems		
Interviewer-assessed measure of closeness	+	
Health and wellbeing		
Age at which breastfeeding stopped (weeks)		
Gestation length in days		
Birth weight (kg)	+	
Mother suffered from post-natal depression		
Home learning environment		
Home learning environment quintile (age 3)	+	
Read to every day at age 3	+	
Home learning environment quintile (age 5)		
Read to every day at age 5		
Parenting style/rules		
Regular bedtimes at age 3		
Regular bedtimes at age 5	+	+
Regular mealtimes at age 5		
Regular mealtimes at age 5		

include gender (with boys catching up somewhat compared to girls at age 3), mother’s age at birth (with the children of older mothers continuing to pull ahead), number of older siblings (those with more older siblings further behind), mother–child relationship problems and regular bedtimes at the age of 5.

What influences cognitive ability at age 11?

Based on our analysis of the ALSPAC, we now look at factors that influence cognitive ability at age 11 – both parental influences (Table A3) and young person influences (Table A4). We find that, even after accounting for long-run family background factors and prior attainment, children are more likely to perform well in tests at age 11 if:

their mother:

- breastfed for at least six months;
- has an external locus of control (i.e. believes that their own actions can make a difference, rather than things being determined solely by fate or chance);

- hopes that they will stay in education beyond age 16, particularly if they would like them to go on to university;

they:

- have strong beliefs in their own ability;
- believe that school results are important;
- have an external locus of control;
- are less likely to engage in antisocial behaviour (such as fighting or stealing);
- do not suffer from hyperactivity or conduct problems;
- have not experienced bullying.

Table A3: Selected parental influences on age 11 primary school attainment

	Key Stage 2, not controlling for prior ability	Key Stage 2, controlling for prior ability
Pre-school environments		
Birth weight	+	
Breastfeeding 6 months+	+	+
Smoking during pregnancy	+	(+)
Home learning environment (age 3)	+	
Child read to daily (age 3)	–	–
Regular bedtimes (age 3)		
Parental attitudes and behaviours		
Maternal locus of control	+	+
Maternal educational aspirations	+	+
Maternal educational interactions	–	–
Maternal non-education interactions	–	–

Table A4: Selected young person influences on age 11 primary school attainment

	Not controlling for prior ability	Controlling for prior ability
Self concepts, values		
Ability beliefs	+	+
Locus of control	+	+
Enjoyment of school	+	
School results are important in life	+	+
Hobbies are important in life	+	+
Material possessions are important in life	-	-
Social and emotional development, behaviours		
Antisocial behaviours	-	-
Hyperactivity	-	-
Emotional symptoms		
Conduct problems	-	-
Experience of bullying	-	-
Peer problems	+	+
Positive activities and teacher-child relations		
Prosocial behaviours (scale)	-	-
Participation in leisure/out-of-school activities (scale)	+	
Teacher-child relations		

Table A5: Selected parental influences on GCSE attainment

	Key Stage 4, not controlling for prior ability	Key Stage 4, controlling for prior ability
Parental education and family background		
Mother educated to degree level	+	+
Lone-parent family	-	-
Mother aged 30-34 at birth	+	+
Mother's health not good at all	-	-
Parental attitudes and behaviours		
Parent thinks young person likely to go to HE	+	+
Family closeness	+	+
Computer at home (age 14)	+	+
Internet access (age 14)	+	+
Gains internet access (age 14-16)	+	+

What influences GCSE attainment?

Based on our analysis of the LSYPE, we now look more broadly at the factors that influence GCSE attainment, paying particular attention to the role of the attitudes and behaviours of parents (Table A5) and young people (Table A6).

We find that, even after controlling for long-run family background factors and prior attainment, young people are more likely to do well at their GCSEs if:

their parents:

- think it likely that the young person will go on to HE;
- spend time sharing family meals and outings; quarrel with their child relatively infrequently;
- devote material resources towards education including private tuition, computer and internet access;

they:

- have a greater belief in their own ability at school;
- have a more external locus of control;
- find school worthwhile;
- think it is likely that they will apply to, and get into, HE;
- avoid risky behaviours such as frequent smoking, cannabis use, antisocial behaviour, truancy, suspension and exclusion;
- do not experience bullying.

Participation in positive activities (such as playing sport or reading for enjoyment) is positively associated with GCSE attainment when we do not control for prior attainment, but not once we include Key Stage 2 and 3 test scores. This suggests that the academic benefits from engaging in positive activities are already reflected in earlier test scores.

Table A6: Selected young person influences on GCSE attainment

	Not controlling for prior ability	Controlling for prior ability
Self-concepts		
Ability beliefs (age 14)	+	+
<i>Stops believing that they will get good marks in school (age 14–16)</i>	–	–
Enjoyment of school (age 14)	+	+
<i>Stops liking school (age 14–16)</i>	–	–
School worthwhile (age 14)	+	+
<i>Stops finding school worthwhile (age 14–16)</i>	–	–
Locus of control (age 15)	+	+
Education aspirations/expectations, and job values		
Likely to apply to HE, and likely to get in (age 14)	+	+
Starts thinking they are likely to go to HE (age 14–16)	+	+
<i>Stops thinking they are likely to go to HE (age 14–16)</i>	–	–
Career importance (scale)		
Peer influence		
Most friends will stay on in full-time education post 16	+	+
<i>Friends stop wanting to stay in full-time education at 16</i>	–	–
<i>Risky behaviours and experiences of bullying</i>		
Smokes cigarettes frequently (age 14)	–	–
<i>Starts smoking cigarettes frequently (age 14–16)</i>	–	–
Has smoked cannabis (age 14)	–	–
<i>Starts smoking cannabis (age 14–16)</i>	–	–
Education behavioural difficulties (age 14)	–	–
<i>Starts playing truant (age 14–16)</i>	–	–
<i>Suspended for first time (age 14–16)</i>	–	–
Antisocial behaviour (age 14)	–	–
<i>Starts antisocial behaviour (age 14–16)</i>	–	–
Experience of bullying (age 14)	–	–
Positive activities and teacher–child relations		
Plays sport every week (age 14)		
<i>Stops playing sport weekly (age 14–16)</i>	–	–
Reads every week (age 14)	+	
<i>Stops reading every week (age 14–16)</i>	–	
Plays a musical instrument (age 14)	+	
Teacher–child relations (age 14)	+	+
<i>Starts liking their teachers (age 14–16)</i>	+	+

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