IPPR

CLOSING THE
ATTAINMENT GAP
IN ENGLAND'S
SECONDARY
SCHOOLS

REPORT

A LONG DIVISION

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INTRODUCTION

This paper investigates the role schools can play in ensuring all children get a fair start in life. The issue of social mobility has risen up the political agenda in recent years, amid concerns that the opportunities provided by over a decade of economic growth have been too narrowly concentrated among a few groups in society. A series of reports has highlighted Britain's low levels of social mobility, showing how children from poorer backgrounds struggle to gain access to university, enter professional jobs and earn decent wages (see Milburn 2012, Sutton Trust 2011, Blanden et al 2005). This in turn means disadvantage can become entrenched across the generations.

Low levels of social mobility are rooted in wider changes to the British economy since the 1970s, following the loss of decent jobs at the bottom of the labour market, the professionalisation of jobs at the top of the labour market, and an increase in income inequality, which have all combined to make it harder for people to climb the ladder of opportunity (Duncan and Murnane 2011). A concerted effort will be required in a number of policy areas to address this problem, but education can play a crucial role. A high level of education has become more important for getting a decent job over the past 30 years, meaning those families which are unable to invest in education are left further behind (Lindley and Machin 2012). Education can provide access to many opportunities later in life, and schools can help to create a level playing field for young people as they start out.

The government, in particular, has turned to schools to try and solve this problem, producing a social mobility strategy that focuses heavily on the academic performance of poorer pupils (Clegg 2012). It has introduced a number of policies designed to raise the achievement of pupils from deprived areas, including converting failing schools into academies, reforming the accountability system to put more pressure on weaker schools to improve, and allocating an additional sum of money, known as the 'pupil premium', to schools that teach children from poorer homes. Government ministers have expressed a desire to close the 'stubborn' gap in achievement at GCSE level that exists between children from deprived areas and their wealthier peers (Gove 2012).

This paper uses original analysis of the latest data available from the National Pupil Database to assess the challenge the government has set itself. It explores the role that schools can play in tackling the link between educational achievement and family income. The first half of the paper sets out the scale of the challenge, and puts the issue in context by comparing how the achievement gap – or, as it is often known, the attainment gap – in England has changed over time and in relation to other countries. The second half of the paper examines the nature of the gap in achievement, and argues for the use of targeted interventions as well as wider 'school improvement' policies. The paper concludes by modelling the impact that the government's flagship policy in this area, the pupil premium, might have on the achievement gap, and sets out what it would take to reach the government's aim of closing it for good.

This paper is concerned with the specific question of what official data sources can reveal about the size and nature of the achievement gap, and how this can inform the design of current government policies. A more comprehensive book, in which leading academics will propose new policy ideas to break the link between poverty and educational achievement, will be published by IPPR later in the year.

1. THE ATTAINMENT GAP IN CONTEXT

1.1 Why does the attainment gap matter?

Education can provide the springboard to a better life. It equips us with the skills, knowledge, friendships and credentials to participate fully in society. Research studies have identified a causal relationship between high levels of education and a number of outcomes in later life, including higher earnings (Dickson 2009), lower teenage pregnancy (Black et al 2008), healthier behaviours and a lower likelihood of serving a prison sentence (Heckman et al 2006). Put simply, education is important for getting on in life.

While not the be-all and end-all of education, school test scores are an important measure of success. Exam results are not just an abstract grade on a piece of paper – they are often directly used to select which pupils progress to further study or a job. In particular, GCSE results are used to determine whether pupils can progress to A-levels and enter university. Only a fifth of the lowest achievers at age 16 go on to acquire any sort of further education or training, while at the other end of the spectrum good GCSEs are a near-essential requirement for entry to a top university (Cassen and Kingdon 2007, Chowdry et al 2008). Wage differentials for the most educated have risen in Britain over the last 30 years, showing that education has become more important in the labour market (Lindley and Machin 2012). Education is a positional good, and a pupil's level of success at school can determine the opportunities that are open to them later in life.

Exam results are not just used to select pupils – they are also a good proxy for the sort of wider skills and attributes that benefit people later in life. For example, educational attainment is highly correlated to cognitive ability, which in turn helps people to form relationships and succeed in the workplace (Dreary et al 2007). School attainment is therefore a good indicator of whether people will be able to participate effectively in society. So while it is true that there is far more to school than exam results, it is also important to acknowledge that achievement at school has a strong influence on people's lives and the choices they can make.

In this context, it is important that every child has an equal *opportunity* to succeed at school. However, a number of academic studies have identified factors that prevent this from becoming a reality (Sylva et al 2012, Duncan and Murnane 2011). A key factor that affects attainment at secondary school is poverty and deprivation. Researchers have used 'natural experiments' – such as when a family receives a sudden drop in income – to show that family income can directly impact a child's educational achievement. For example, Gregg et al (2012) have shown how, in England, a child's educational progress suffered if their father lost his job in the recession of the 1980s, something that didn't happen for children whose parents remained in work. Similar results have been found after spikes in job losses in the United States (Ananat et al 2011, Dahl and Lochner 2008).

These findings show that family income causally impacts educational achievement, and this in turn strongly determines opportunities later in life. The relationship between family income and education therefore matters immensely, as a child born into a poor family 'faces life-long penalties regardless of their own abilities or effort' (Gregg and Macmillan 2010: 260). Gaps in education performance can go on to entrench wider inequalities in the labour market, housing market and social structures. Tackling the gap in achievement that exists between pupils from poor backgrounds and their wealthier peers is therefore an important goal for policymakers, and is vital if we are to boost social mobility in Britain (Blanden et al 2007).

The large gap between high and low achievers is not just a matter of social justice. High levels of underachievement also reflect wasted human capital – resources that could be vital to economic recovery. The Princes Trust has estimated that low educational achievement among 17–24 year olds costs the UK economy around £22 billion in lost earnings (Princes Trust 2010). Moreover, higher levels of education have been shown to increase national growth rates, particularly in open economies like the UK (Jamison et al 2007).

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Box 1.1: Educational attainment is only one piece of the jigsaw
The focus of this paper is on narrowing the achievement gap in schools – which is one way to help raise social mobility and improve outcomes in later life. But it is important to remember that raising achievement alone is not enough. There also needs to be sufficient demand for these skills and qualifications in the labour market, so that young people can put their education to good use. Recent cuts to post-16 education, a weak youth labour market and the prevalence of low-quality jobs will also have to be tackled for improvements to social mobility to be realised (Lawton and Lanning 2012, Keep et al 2006). Other factors can also be important to social mobility, such as having access to social networks and inherited wealth. Raising achievement in schools is therefore just one piece of a much bigger jigsaw.

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1.2 What role can schools play in narrowing the achievement gap?

A child's educational development is influenced by a complex range of factors, including their individual characteristics, the wider family environment, the neighbourhood where they live and the schools they attend. This has led to a longstanding and fierce debate about the role that schools specifically can play in narrowing the achievement gap. On one side, commentators argue that the factors influencing low attainment lie outside the control of individual schools, and that it is not possible for them to overcome the wider problems of poverty and disadvantage. They highlight issues such as homelessness, poor health, violence and a lack of education materials that cannot be rectified by schools alone (see for example Cody 2012). On the other side, commentators point to excellent schools that have succeeded in raising achievement among disadvantaged students and argue that improving the quality of schools should be sufficient to narrow the gap. They reference schools like Mossbourne Community Academy in Hackney to make the case that poverty should not be 'an excuse' for low achievement (see for example Wilshaw 2012a, Dobbie and Fryer 2011).

In an attempt to shed light on this question, academic studies have tried to identify which factors are most important for making educational progress. These studies differentiate between variance that is attributable to schools and variance that is attributable to individual pupils (as a result of family influences, neighbourhood effects and so on). They generally find that about 20 per cent of variability in a pupil's achievement is attributable to school-level factors, with around 80 per cent attributable to pupil-level factors (Rasbash et al 2010). This finding is supported by our research, presented in section 2.2. The exact way in which poverty affects low achievement is much harder to understand. There will be a number of 'transmission mechanisms' such as parenting styles, cognitive ability and nutrition that explain the link between income and achievement (Goodman et al 2010: 2). This suggests a focus on the wider family and economy should play an important part in

narrowing the achievement gap. It also suggests that efforts by schools to close the gap could focus around making up for what some families and communities fail to provide.

In this light, there is a particular danger that the current recession will increase the size of the achievement gap, as happened in previous recessions (Gregg et al 2012). The recent trends towards increased unemployment, child poverty and income inequality mean schools will have to work even harder to narrow the gap in achievement. As we show in section 1.5, the recession of 2009 may already be having an impact on GCSE results, which showed a widening achievement gap in 2011. In government terms, this means policies pursued in relation to the economy, communities and job market may undercut the ability of education policy to increase social mobility.

While many of the factors driving low achievement lie beyond the direct control of schools, it is a mistake to assume that schools cannot therefore be part of the solution. As a key public service, schools are charged with mitigating these wider effects of poverty. More than any other institution, they can help level the playing field so that all children get a fair start in life. As we show in section 2.2, pupils who attend an outstanding school are likely to achieve approximately one grade higher in all their GCSEs than pupils attending an inadequate school. The quality of schooling can therefore make a big difference to the life chances of children.

An investigation by Allen and Burgess (2011) shows that the choice of secondary school is particularly important for disadvantaged pupils, far more so than for wealthier pupils, who tend to do well whichever school they attend. Case studies of good schools serving disadvantaged communities also show that high-quality education can help to transform lives and compensate for shortcomings elsewhere in society (Ofsted 2010). It is therefore possible to argue that schools *can* reduce educational inequality, although their job will be made much harder in the face of wider social problems such as poverty, poor parenting and a weak labour market.

This paper explores the role that schools policy can play in narrowing the achievement gap. Policymakers have tended to rely on the intuitive assumption that 'having better schools' will be enough to break the link between poverty and attainment. This has been the logic driving schools policy for the past decade, including the introduction of academies under the previous Labour government and tougher inspections for 'satisfactory schools' brought in under the current Coalition government. But despite a sustained improvement in the quality of schools, the gap in achievement between rich and poor children remains large. It is therefore necessary to think about new ways that schools policy can help to narrow the gap in achievement, beyond a general focus on school improvement (Cook 2012a).

While acknowledging the impact of wider factors on educational achievement, in this paper we argue that schools can – and should – be charged with narrowing educational inequality. However, a focus on general school improvement policies will not be sufficient to do the job. Policymakers also need to consider how interventions targeted at the individual pupil level can be used to narrow the achievement gap. This first chapter of the paper outlines the scale and nature of the challenge that schools face. The second chapter assesses the likely impact that the government's flagship policy in this area – the pupil premium – will have on the achievement gap.

1.3 The problem

The link between poverty and educational achievement is well known. The government often reports this by comparing the results of pupils who are eligible for free school meals with those who are not eligible for free school meals. For example, last year, 34 per cent of pupils on free school meals achieved five good GCSEs including English or maths, compared to 62 per cent of better-off pupils (DfE 2012). This provides a useful snapshot of the problem, but it masks a bigger story.

As figure 1.1 shows, the problem is not just that a group of the poorest pupils fail to reach a basic level of education (though this is certainly true). Rather, there is a clear and consistent link between deprivation and academic achievement wherever you are on the scale. Those pupils living in the most deprived postcodes score on average 320 points at GCSE, or the equivalent of about eight Cs, and the results gradually improve as you move towards the least deprived postcodes. Pupils living in the wealthiest postcodes score on average 380 points, or the equivalent of just over eight Bs. It is therefore not possible to identify a particular level of deprivation at which performance falls. This challenges the assumption that programmes targeted towards pupils who are eligible for free school meals will be sufficient to close the gap, as the problem is much wider than just this group of pupils.

It is important to stress that this relationship is not deterministic. The line is the average performance of pupils living in these postcodes, and many do considerably better than this. It is perfectly possible for a child living in a deprived neighbourhood to achieve excellent results that are higher than those of wealthier pupils. However, the graph shows that the general trend is for this not to happen. As discussed already, this relationship is a problem because it means children could face big penalties in later life simply as a result of where they live when they are young. The ambition for policymakers concerned with narrowing the achievement gap is therefore to get the line on figure 1.1 as flat as possible, so that the link between deprivation and academic achievement is broken. Of course, they will want to achieve this by raising the performance of those pupils from poorer homes, rather than by holding back the top performers, in order to ensure that there is both excellence and equity in the school system.

Figure 1.1
Capped GCSE points by
postcode deprivation
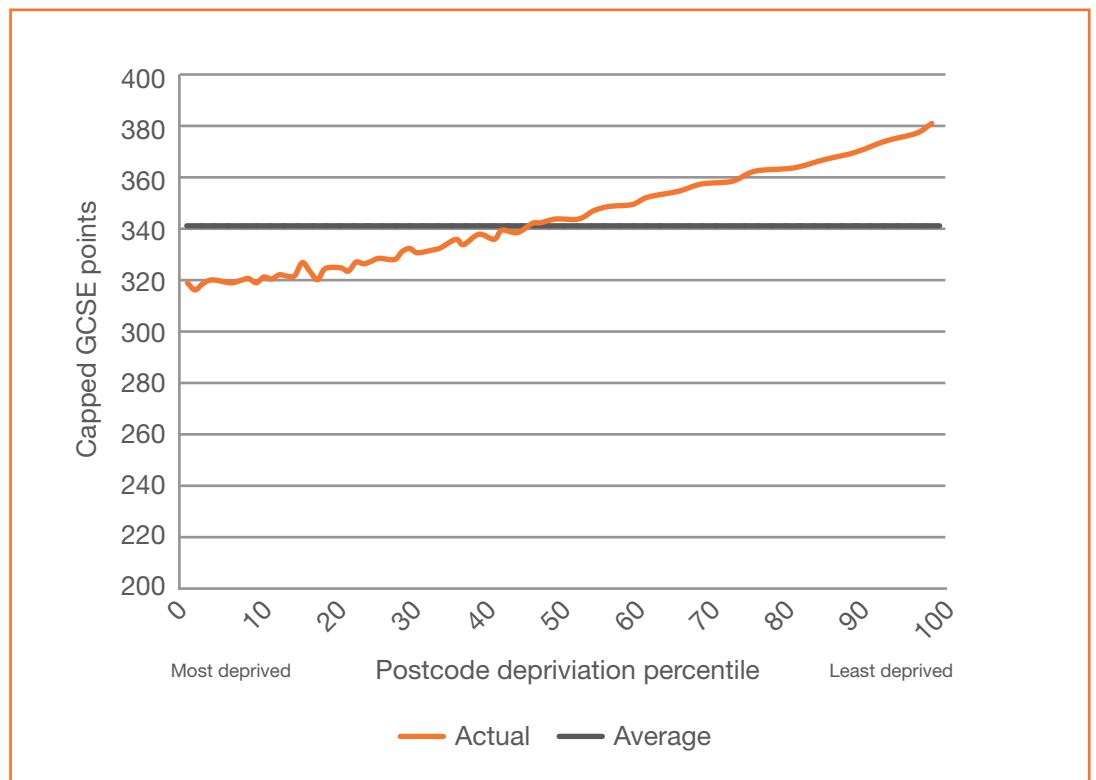
There are a number of factors that might affect the extent of this relationship between academic achievement and deprivation. These include ethnicity, gender, the language a pupil speaks and whether they have special educational needs (SEN). These characteristics will affect how steep the gradient is between achievement and deprivation. For example, pupils who speak English as an additional language have a flatter gradient, suggesting that level of deprivation has a smaller impact on the results of these pupils.

A detailed examination of these additional factors lies beyond the scope of this paper, but it is worth pausing briefly to reflect on the question of SEN. This is because pupils with SEN may require different interventions to help raise their achievement, and it may be harder for schools to raise their achievement than it is for other pupils. Figure 1.2 shows the effect that pupils with SEN have on the achievement gradient. The blue line is the actual gradient for all pupils and the orange line is the gradient when SEN pupils are excluded from the data.[1]

The graph shows that removing SEN pupils from the dataset does flatten the gradient, indicating that pupils with SEN are disproportionately from lower socioeconomic backgrounds. Some of what we observe in the attainment gap is therefore a specific issue of SEN – which might require different approaches to tackling low attainment than schools use for other pupils and who already may benefit from additional resources and interventions. However, the majority of the attainment gap remains after excluding SEN pupils, showing that it accounts for only a small part of the difference.

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1   We have only excluded those pupils with the more severe cases of SEN (defined as those with a SEN statement or at School Action Plus). The less severe cases (defined as those with School Action) were not excluded due to concerns of possible differential designation of pupils into this category between schools. We are therefore confident that the pupils we have excluded represent those who have significant learning needs.

Figure 1.2
Effect of SEN pupils on
attainment gradient
(capped GCSE points)
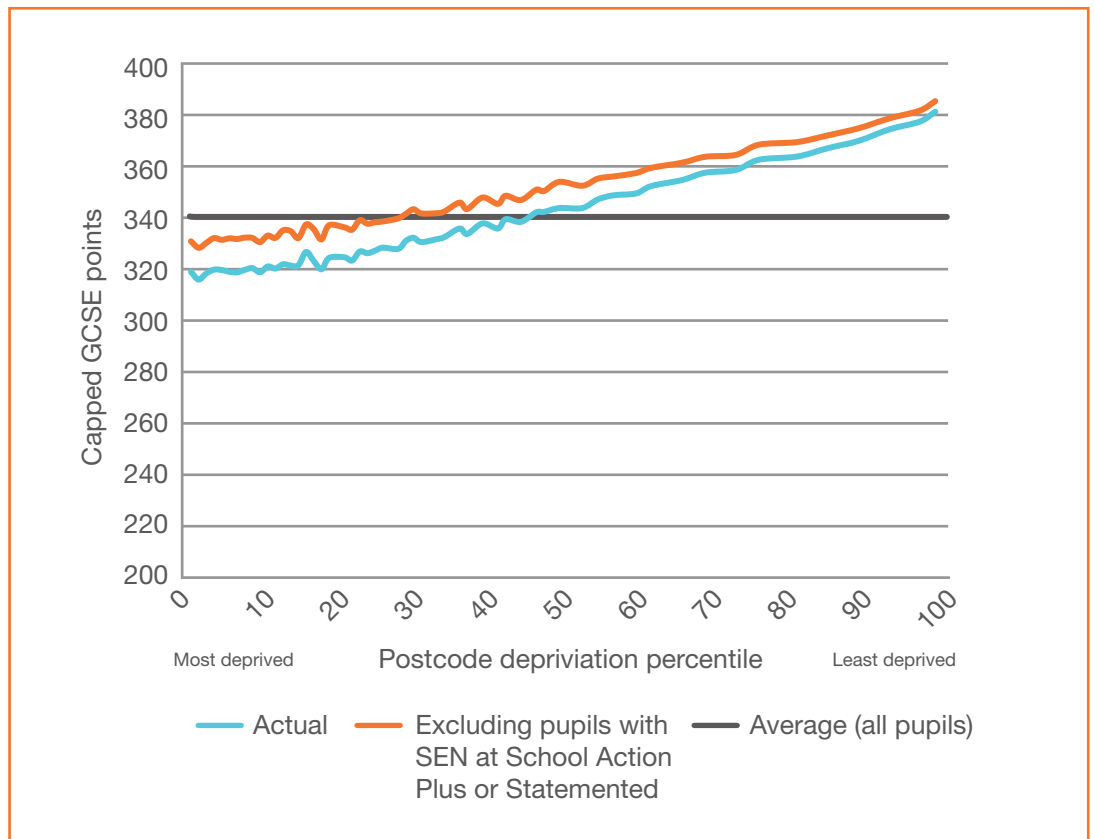
Box 1.2: Methodology
The analysis presented in this paper, unless otherwise stated, uses data from the National Pupil Database (NPD). The data is for pupils who completed their GCSEs in the 2010/11 academic year and were educated within mainstream schools.

For a measure of deprivation we use the Income Deprivation Affecting Children Index (IDACI), which is constructed for each pupil based on the postcode where they live. This was deemed preferable to using 'eligibility for free school meals' as a measure of disadvantage for two reasons. First, it allows us to plot achievement over a continuum from the most deprived to the least deprived households, whereas using free school meals would only allow us to make a binary comparison between students identified as 'poor' and 'not poor'. Second, it is a more accurate measure of deprivation based on family incomes in particular neighbourhoods. The measure of free school meals can often miss children who have parents who are not drawing certain benefits (and are therefore ineligible for free school meals) but nevertheless live in disadvantaged circumstances. It also treats those who do not claim free school meals as a homogenous group, when in reality there may be a large variation in social backgrounds among these pupils. For a detailed discussion of the merits of each measure see Chowdry and Sibieta (2010).

For a measure of educational achievement we use the official capped GCSE points score. This is a pupil's best eight GCSE results expressed as an overall point score, where each grade is given a certain number of points. For example an A* is worth 58 points, an A is worth 52 points, a B is worth 46 points and so on. The maximum score is therefore 464 points, which translates into eight A* grades. For a detailed breakdown of how many points each grade is worth see appendix A.

There has been some debate among policymakers about the use of 'equivalent qualifications' when analysing educational achievement. Some studies give vocational qualifications an equivalent number of points to GCSEs so they can be included as a measure of achievement. Others exclude vocational qualifications from their analysis because they believe they do not represent the same level of achievement as taking a GCSE, and that schools have used them to artificially boost their position on league tables. Both approaches have drawbacks: excluding equivalents assumes that the vocational qualifications a child has been studying towards count for nothing, while including equivalents assumes they hold the same value as a GCSE. The reality is that they lie somewhere in between.

We have conducted our analysis using both methods. The results presented in the main body of the paper use the measure of GCSEs including equivalent qualifications. In appendix B, we repeat the same analysis using the measure of GCSEs *excluding* equivalent qualifications. Under the second approach, the class gap is larger, suggesting that vocational qualifications have been disproportionately used for pupils from poorer homes. While the size of the gap is bigger in the second case, the overall trends and patterns remain similar whichever method is used, suggesting that this factor has little impact on our findings.

1.4 How does the achievement gap in England compare to other countries?

The link between social class and educational performance is not unique to England. The influential Programme for International Student Assessment (PISA) shows that an achievement gap between rich and poor pupils exists in all OECD countries. In the latest test, students from more socioeconomically advantaged backgrounds outperformed students from average backgrounds by around 38 points, the equivalent of one year's worth of education (OECD 2010a: 14).

While a relationship between family background and education performance exists in all countries, the strength of that relationship varies considerably. In England, the relationship between social class and educational performance is particularly strong, and we also have a higher than average degree of social segregation in our schools (Cassen and Kingdon 2007). Many countries that have equitable systems also have high overall standards, including Finland, Canada and Korea. This shows that it is possible to have both equity and excellence in a school system – these need not be viewed as competing objectives (OECD 2010a: 57). Indeed, research by Hanushek and Woessmann (2012 forthcoming) shows that concentrating on both lower-level attainment and high performers is complementary in terms of raising skill levels and economic growth at a national level.

This evidence challenges the popular logic of ignoring those who are struggling for fear of holding back those at the top.

The OECD has created a number of measures of equity in school systems using the results of the PISA assessment. This enables us to benchmark how the UK fares in relation to the OECD average, and also to those high performing systems that are viewed as our key competitors. Box 1.3 summarises how the UK compares to other countries on some key indicators.

Box 1.3: Equity in the school system: how the UK compares to other countries

	Strength of socio-economic gradient	Slope of socio-economic gradient	Percentage of 'resilient students'	Proportion of students failing to reach level 2 baseline
United Kingdom	14	44	6	19
Key competitors' average*	11	38	11	10
OECD average	14	38	8	18

*Key competitors are defined as Australia, Canada, Finland, Korea and Singapore. These were chosen as countries that traditionally score well on PISA and are frequently cited in comparison to UK performance.
Source: Adapted from OECD 2010c

Strength of socioeconomic gradient: The OECD constructs a socioeconomic gradient, which summarises many of the aspects of educational equity that can be analysed by PISA. The strength of the gradient measures the percentage of variation in student performance that is explained by the student's background. Equitable systems will have a low score. The UK has the same score as the OECD average (14 per cent) but in competitor countries this is lower still, at 11 per cent.

Slope of socioeconomic gradient: This measures the average gap in performance between students from different socioeconomic backgrounds. The slope shows how much a student's performance changes with a change of socioeconomic status. The steeper the gradient, the greater the impact socioeconomic background has on performance. Equitable systems will therefore have a low score. The OECD average is 38 points, which means for every extra unit on the index of socioeconomic status, students will on average score 38 points higher on the test. The UK is well above the OECD average, with a score of 44.

Percentage of resilient students: These are defined as students who come from the lower quartile in terms of socioeconomic background but go on to score in the top quartile in terms of their PISA test results. They can therefore be seen as having 'overcome' a disadvantaged background. On this measure, the UK trails both the OECD average and key competitors, with only 6 per cent of students being defined as 'resilient'.

Proportion of students reaching baseline proficiency: A key measure of absolute outcomes in an education system is the proportion of students who achieve the basic proficiency required to lead an effective and productive life. On the PISA test, this is defined as the proportion of students who score below level 2. On this measure, the UK performs almost exactly at OECD average, where 19 per cent of students fail to achieve level 2. But it trails well below high-performing systems, which are able to get all but 10 per cent of their students to this level.

Box 1.3 shows that the UK generally performs below the OECD average on measures of equity in the school system, and significantly worse than those high-performing systems regarded as our key competitors.

As well as measuring the impact that socioeconomic status has on student achievement, PISA also allows us to compare the range of results between high and low performers. This is important as a measure of absolute outcomes in the school system – telling us what proportion of students are reaching different levels of attainment. While not directly related to the issue of whether these gaps are driven by social class, we know that low performers will disproportionately come from poorer households and high performers tend to be from wealthier homes.

There is significant performance variability within the UK, and this range in performance is slightly larger than in other countries (OECD 2010b). High-performing countries such as Korea and Finland have a narrower range of scores overall. Table 1.2 shows the proportion of pupils at each level of performance compared to other countries. In this, the UK closely mirrors the OECD average. Unsurprisingly, the countries that perform best on PISA have both fewer low achievers than the UK and a greater proportion of high achievers.

Table 1.2
Percentage of students at each level of the PISA proficiency scale for reading, 2009

	Below level 2	Level 2	Level 3	Level 4	Level 5	Level 6
United Kingdom	18	25	29	20	7	1
Key competitors' average*	10	18	30	28	12	2
OECD average	19	24	30	21	7	1

*Key competitors defined as Australia, Canada, Finland, Korea and Singapore. These were chosen as countries that traditionally score well on PISA and are frequently cited in comparison to UK performance.
Source: Data from OECD 2010c

Of particular note in this table is the sheer volume of UK students failing to achieve basic proficiency (level 2). Around a fifth of students failed to reach basic proficiency in reading and maths, which translates to around 113,000 students in England. This group is more than twice as big as the group of students that reached the top two performance levels.

A picture therefore emerges of a large pool of 'poor performers' that contributes to the UK's weak performance in international rankings. This is confirmed by OECD analysis

looking at the size of the distribution around the average ('middle-performing') student. It found that the gap between the bottom performers and middle performers was bigger than the gap between the middle performers and the top performers (OECD 2010c).[2] In other words, there is a bigger gap created by students falling behind the average score than there is by students pulling away at the top.

These international comparisons show that high-performing countries do not just have lots of students at the highest levels, but also relatively few students at the lower levels (OECD 2010c). The UK therefore faces a two-horned challenge both to stretch those at the top and to raise the performance of those falling behind. In terms of quantity of pupils, the latter is the bigger challenge, with around a fifth of pupils failing to get the basic skills required to succeed in life.

Table 1.3 gives an indication of the scale of the challenge if the English school system is to become 'world-class'. In the first row, it shows the current number of pupils at each level of performance on the PISA scale. In the second row, it calculates how many of these pupils would have to improve by one level in order for England to have the same distribution of scores as our key competitors. For example, of the 112,994 pupils currently scoring below level 2 on the PISA test, 50,220 would have to reach level 2 in order for England's distribution to match that of high-performing countries. The third row of the table shows the percentage change required at each level. It is clear that the biggest challenge – both in terms of the proportion and absolute number of students that need to improve – is raising the achievement of lower performers. Over 80 per cent of the pupils who would need to improve by one level to ensure the UK matches competitor countries come from attainment levels 3 or below.

Table 1.3
Change required among English pupils to match the distribution of world-class systems (PISA 2009)

	Below level 2	Level 2	Level 3	Level 4	Level 5	Level 6
Current number of pupils in England at each level of performance	112,994	156,936	182,046	125,549	43,942	6,278
Number of pupils needed to move up one level if England is to match performance of key competitors*	50,220	94,162	87,884	37,665	6,277	0
Percentage of pupils needed to move up one level if England is to match performance of key competitors*	44%	60%	48%	30%	14%	0%

*Key competitors defined as Australia, Canada, Finland, Korea and Singapore. These were chosen as countries that traditionally score well on PISA and are frequently cited in comparison to UK performance.
Source: Authors' calculations based on data from OECD 2010c

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2   The gap between the 90th percentile and the median is larger than the gap between the median and the 10th percentile.

A key feature of the world's best education systems is that they have only few students performing at a low level and stretch those at the top. They also have a weaker relationship between social class and educational achievement. If England wishes to develop a world-class school system, it must try to reflect these features.

1.5 How has the attainment gap changed over time?

Most official data sources on the attainment gap measure the difference in GCSE results between pupils eligible for free school meals (FSM) and those wealthier pupils who are not eligible for free school meals. This data shows that while both groups have improved their results in recent years, there has been a faster improvement among the FSM-eligible group (see figure 1.3). There has therefore been a small narrowing of the class gap.

Figure 1.3
Changes in the attainment gap at GCSE, 2003–2011, by free school meals eligibility (Percentage of pupils)
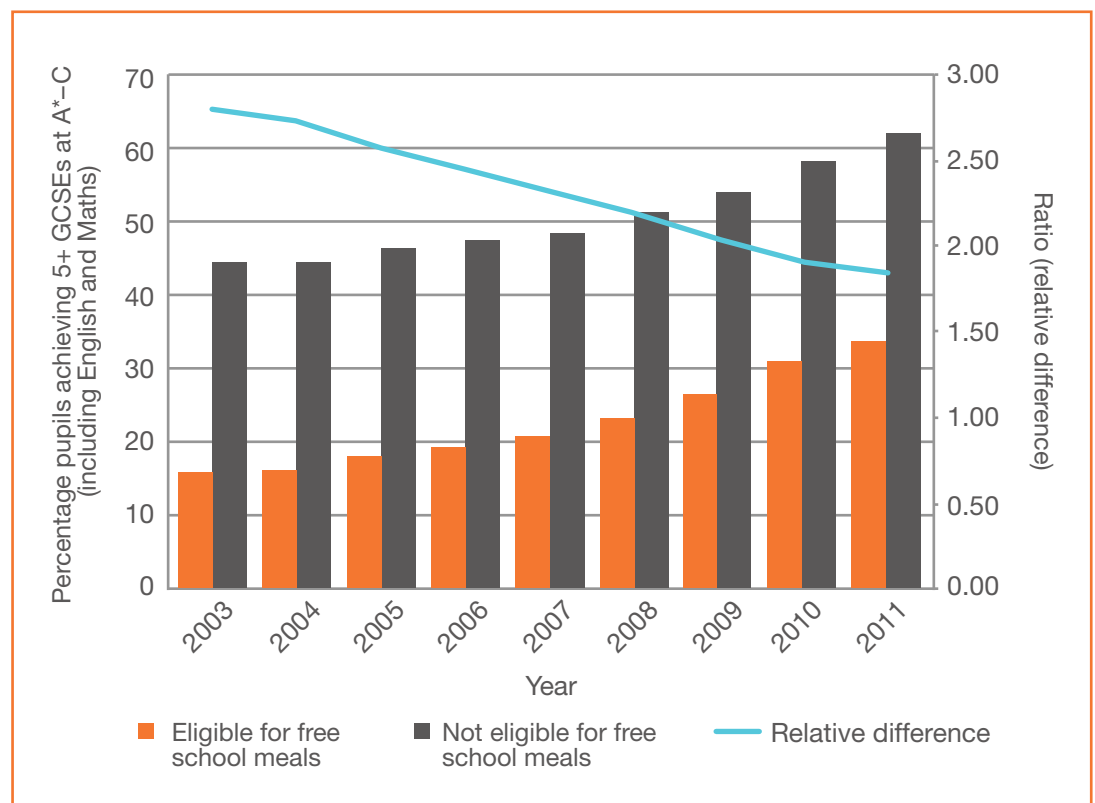
Source: 2003–2007: DCSF 2009
2008: DCSF, *Attainment by pupil characteristics in England 2007/8: Statistical First Release*
2009: DCSF, *Attainment by pupil characteristics in England 2008/9: Statistical First Release*
2010: DfE, *Attainment by pupil characteristics in England 2009/10: Statistical First Release*
2011: DfE, *Attainment by pupil characteristics in England 2009/10: Statistical First Release*

Other research has used data from birth cohort studies to look at the question of whether the achievement gap has narrowed. This approach allows a more nuanced assessment, linking GCSE results with family incomes over longer periods of time. These studies confirm a similar pattern of a narrowing class gap between generations born in the 1970s and those born in the 1980s and 1990s. This pattern was seen both in school exams and in standardised IQ, literacy and numeracy tests – taken by different cohorts of children – that are not related to GCSEs (Gregg and Macmillan 2010).

There have been some criticisms that recent improvements in GCSEs are the result of grade inflation rather than genuine improvements in ability (for example, see Coe 2011). In particular, schools have been criticised for entering pupils for 'equivalent qualifications' that artificially boost their performance on GCSE results. These are genuine concerns for the school system that the government is rightly addressing, but they do not detract from the fact the achievement gap between rich and poor pupils began to narrow in recent years. Analysis by Cook (2011) found that between 2006 and 2010, even after stripping out the effects of grade inflation, the achievement gap closed by one-sixth of a grade in core GCSE subjects such as maths, English, sciences, modern languages and humanities. Cook found that the use of 'equivalent qualifications' did create the impression of a faster improvement in the scores of disadvantaged children, but even when these qualifications were excluded, a narrowing of the gap remained. Grade inflation cannot explain more than a fraction of the reduction in educational inequality in recent years.

It is difficult to identify what drove this improvement in educational achievement among the poorest pupils. A key part of the story will be reductions in child poverty and urban deprivation that in turn had an impact on educational achievement. Increased immigration and an increasing ethnic minority population could also explain the improvements, since the educational achievement of immigrants and ethnic minorities has been found to be less affected by family income (Luthra 2010, Kapadia 2010). Reforms to qualifications in the late 1980s will also have had a part to play, as they encouraged more children to stay in academic education and enabled them to achieve higher grades[3] (Machin 2003). Some of the more recent GCSE results will also reflect the education policies of the previous government, such as improved teaching and investment in schools in deprived areas, the provision of wrap-around services, such as the extended schools programme, and targeted interventions in literacy and numeracy. This suggests that public policy can turn the tide of low achievement.

While the link between deprivation and academic achievement weakened in the years leading up to 2010, there are worrying signs that these gains may have started to reverse. Figure 1.4 shows a measure of how strongly deprivation impacts GCSE results. While there were steady improvements between 2006 and 2010, the relationship got stronger again in 2011. It is not possible to identify what caused this, though it is likely to be the 'aftershock' of recession and rising unemployment, which has been shown to harm the academic performance of children in affected families (Gregg et al 2012).

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3   The introduction of GCSEs in 1988 allowed an increase in the proportion of pupils obtaining top grades providing they achieved the required standard, which in turn encouraged more children to stay in academic education and motivated them to achieve higher grades (Machin 2003). Prior to 1988, the proportion of students able to obtain a particular grade was fixed.
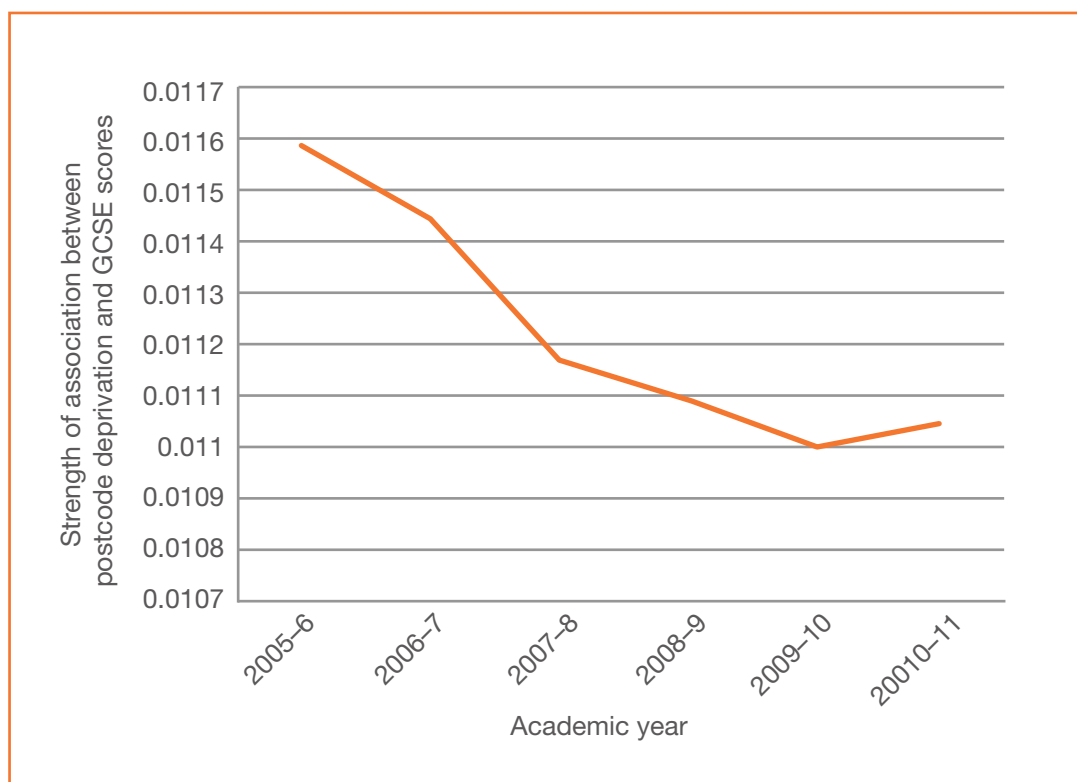
Source: Cook 2012b

Gaps in achievement by family income have therefore started to close over the last decade, but they remain very large and may even be starting to increase as a result of the recession. As a society, we are still failing large numbers of young people, and schools have an important part to play in rectifying that.

1.6 A challenge at the top and bottom

As noted in box 1.2, tackling the attainment gap has generally been couched in terms of improving the performance of pupils who are eligible to receive free school meals (FSM), so that they match the results of the rest of the year group. Figure 1.5 shows the proportion of pupils at each grade level for both FSM and non-FSM groups. Unsurprisingly, a lower proportion of FSM pupils score top grades than non-FSM pupils. FSM pupils are also more likely to get low grades than their wealthier counterparts. The challenge the government has set itself is essentially to make the orange bars and grey bars even up, so that the performance of FSM pupils equals the performance of non-FSM pupils.

Figure 1.5
Distribution of GCSE
results by free school
meals eligibility
(Percentage of pupils)
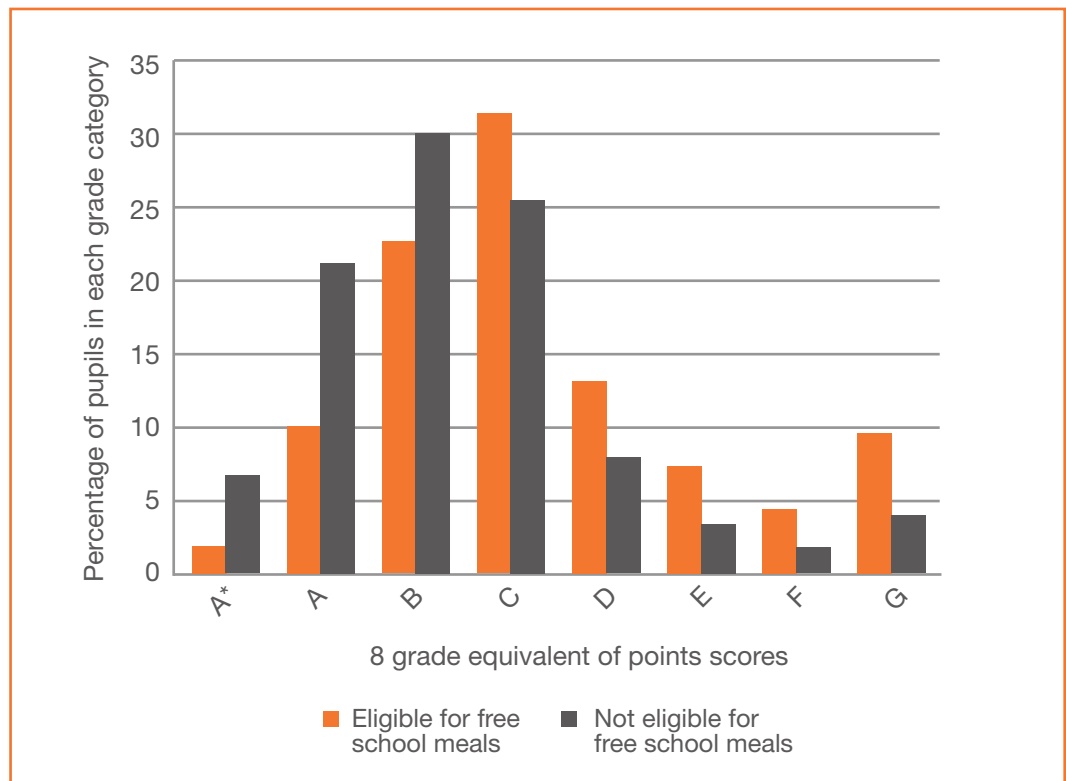
The government has placed particular emphasis on increasing the number of FSM pupils who get top GCSE results and gain access to elite universities and professions (see for example Gove 2012, Clegg 2012). The previous government also focused its attention on the proportion of FSM pupils that achieved five good GCSEs at grades A*–C.

This chart shows that the government is right to be concerned about the low proportion of FSM pupils achieving top grades at GCSE. Ensuring bright pupils from disadvantaged homes are stretched will be important for narrowing the achievement gap. This will require a number of these pupils to raise their performance by the equivalent of one grade in each of their subjects. We estimate that around half of the FSM pupils that currently achieve straight-As would need to achieve straight-A* grades in order eradicate the achievement gap at the very top of the distribution.

While raising achievement at the top is important, it is only a small part of the picture. It is apparent from figure 1.5 that there is also a long tail of underachievement among FSM pupils that needs to be tackled. This will require a much larger shift in grades to eradicate. Many of those pupils who currently score the equivalent of straight-Es, Fs and Gs will need to improve by two or three grades across the board. For example, one-third of the FSM pupils who currently score straight-Gs would need to improve by the equivalent of two grades across the board, getting straight-Es, in order to eradicate the gap. This is a much bigger jump than is required at the top of the distribution, where pupils generally need to improve by just one grade in each of their subjects.

Figure 1.6 shows why big improvements are needed among low achievers to help narrow the class gap. There is a much bigger variation in GCSE results among poorer pupils than there is

among wealthier pupils. The highest-achieving pupils from deprived postcodes score almost as well as the highest-achieving pupils from wealthier areas – they score about 40 points less at GCSE. However, the low-achieving pupils from deprived neighbourhoods score much worse than the low-achieving pupils from wealthier areas – they score about 120 points less at GCSE. In essence, the challenge for policymakers is to reduce the large variation in scores that occurs among children from deprived areas. The positive story from this graph is that plenty of pupils from deprived areas do score highly at GCSE, showing that deprivation does not equal destiny when it comes to exam results – many deprived pupils are high achievers.

Figure 1.6
Variation in pupil performance at GCSE, by postcode deprivation (capped GCSE points)
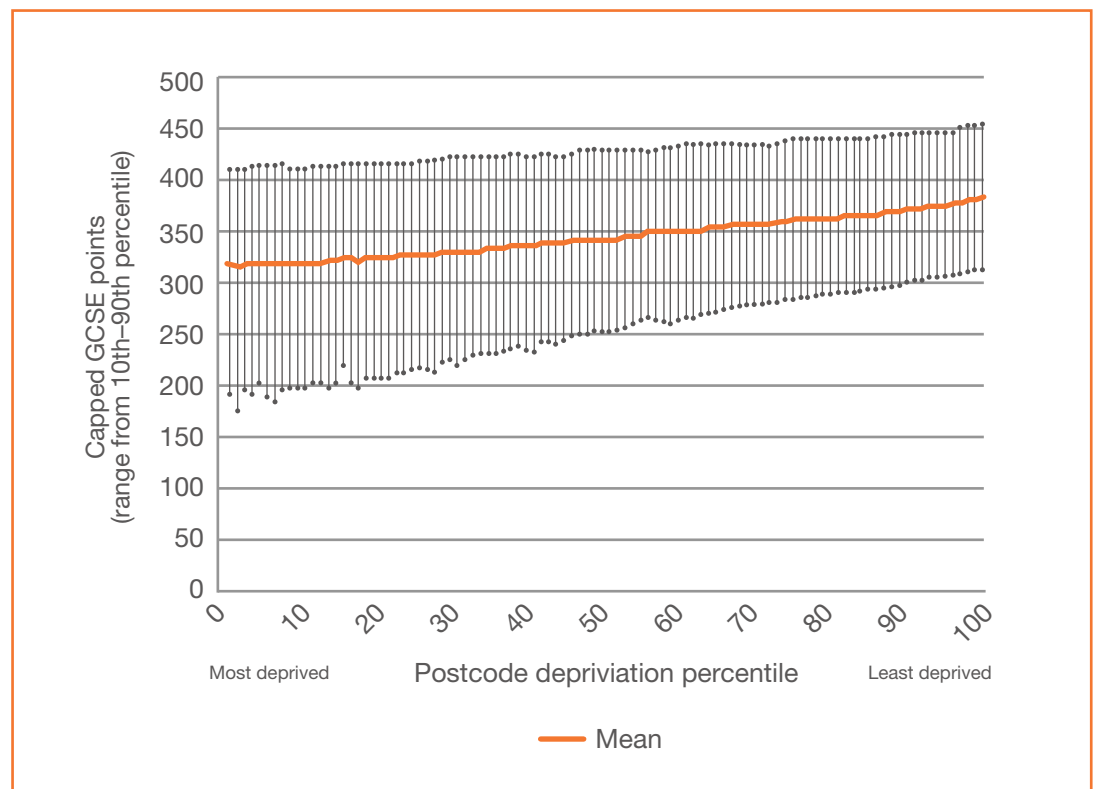
Policymakers are right to be concerned about stretching the most able pupils from deprived areas, with its potential to help them secure access to good universities and professions. However they must not lose sight of the bigger challenge facing the English system: tackling low achievement among poorer pupils. As the international comparisons in section 1.3 showed, the key to creating a world-class school system lies in raising the performance of those at the very bottom as well as stretching those at the top. This is also true for the strongest performing part of the English system – London's successful school results are largely the result of having far fewer low attainers than the rest of the country (Cook 2012c).

The first section of this paper has outlined the nature of the attainment gap. It showed that the link between achievement and social class needs to be broken at all levels of performance, but the greatest challenge will be to reduce the variation in scores among deprived children by raising the performance of low achievers. The remainder of this paper looks at the role secondary schools can play in helping to achieve this aim and draws out the implications for government policy.

2. USING SECONDARY SCHOOLS TO TACKLE THE ATTAINMENT GAP

2.1 How much of the achievement gap is a result of what happens at secondary school?

The gap in achievement is not something that occurs only in secondary school. The influential work of Feinstein (2003, 2004) has shown how educational inequalities appear as early as age three and then continue to widen as children grow up. While the extent of 'cognitive decline' among young children from poor homes has been overstated in this research,[4] it is nevertheless true that class gaps in education begin very early in life. This is because children from wealthier families are exposed to more stimulating environments and a larger vocabulary in their early years, which enables them to develop their cognitive abilities at a faster rate. A large part of the achievement gap that we witness at age 16 therefore did not occur in secondary school – it was already present by the end of primary school.

Figure 2.1 shows the primary school results for the cohort of pupils who sat their GCSEs in 2010/11. The graph splits pupils into quintiles based on their academic performance, and it is clear that there was already a substantial achievement gap among this group of students by age 11. In the most deprived postcodes, the majority of pupils were in the bottom two attainment quintiles, whereas in the most affluent postcodes the majority of pupils were in the top two attainment quintiles. We estimate that around half of the achievement gap we witness at age 16 was already present when these pupils started secondary school.

Figure 2.1
Postcode deprivation percentile versus Key Stage 2 attainment quintile (Percentage of pupils)

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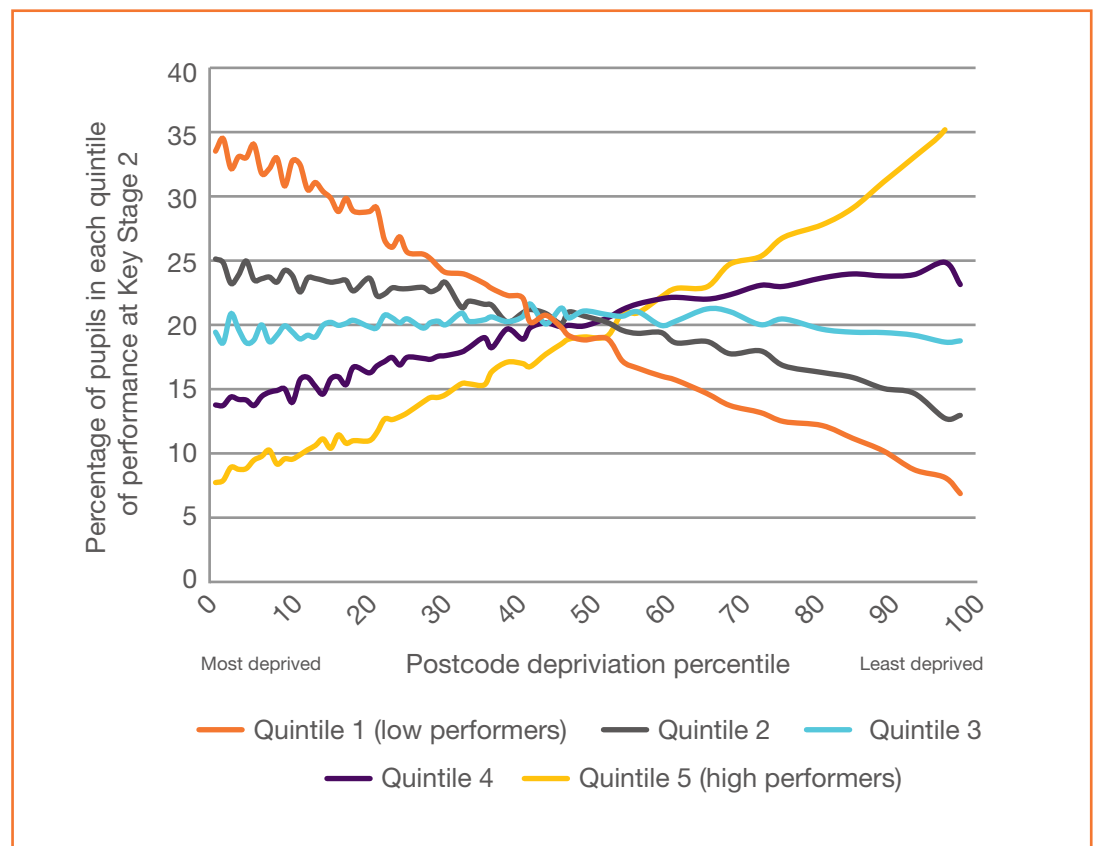
4   Jerim and Vignoles (2011) point to a methodological problem with research that claims that the cognitive skills of high-ability children from poor backgrounds rapidly declines. They argue that this finding is largely related to a statistical problem known as regression to the mean.

It is clear from this finding that even if the gap in attainment did not widen at all during secondary school, a substantial gap would still exist at GCSE as a result of inequalities from earlier in life. This can be seen in figure 2.2, which models how the attainment gradient at age 16 would change if secondary schools managed to ensure that all pupils made the same level of progress regardless of their background. We see that the gradient improves only slightly, because a lot of the difference in performance was already present on entry to secondary school.

Figure 2.2
Attainment gradient if progress over secondary school was equalised for all pupils to the average level of progress (capped GCSE points)
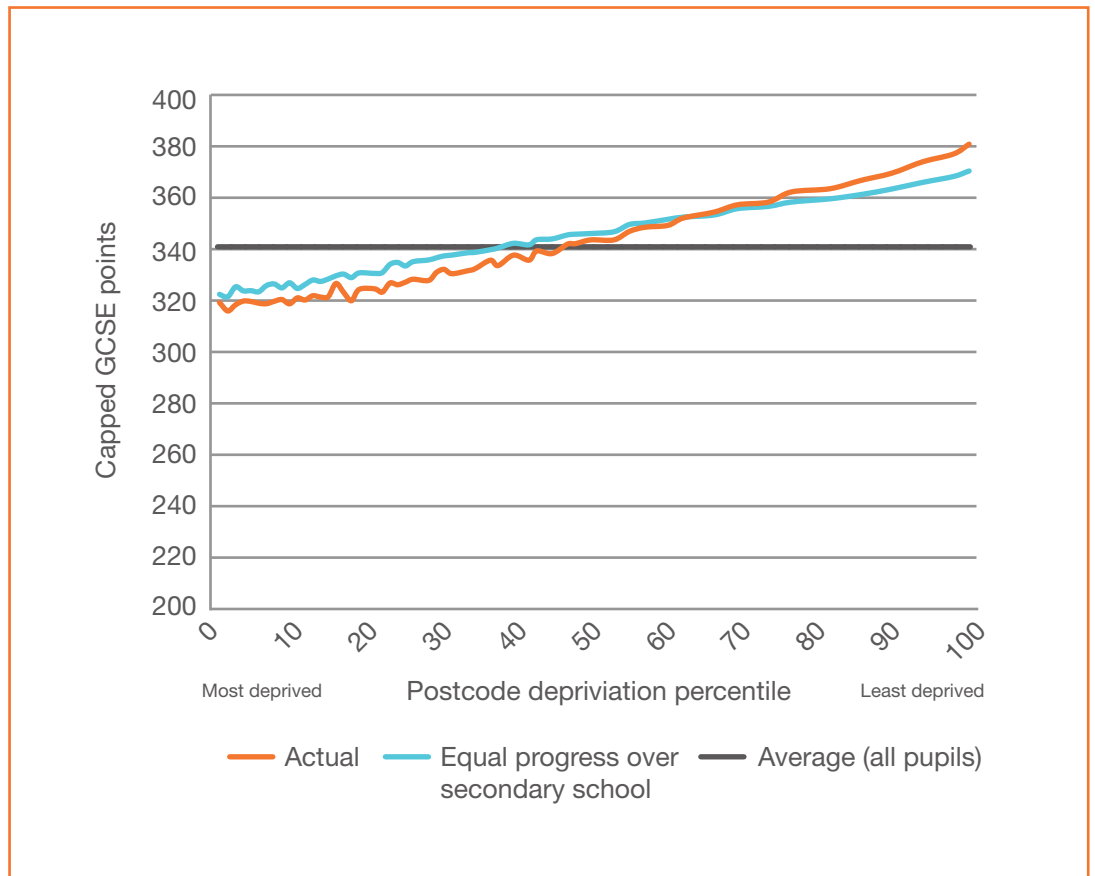

This finding has two implications for policymakers. First, it will be hard for secondary schools to do all the work in narrowing the attainment gap – primary schools and early years services will also have their part to play. Second, it will not be sufficient for secondary schools to simply ensure that all pupils make equal levels of progress. Rather, they will have to actively target those pupils who are already falling behind when they start out in year 7. Targeting pupils who fall behind in late primary school and early secondary school will be particularly important, as research shows the attainment gap widens very quickly between the ages of 7 and 14 (Goodman et al 2010).

2.2 Can 'school improvement' policies narrow the attainment gap?
A common explanation for the attainment gap is that pupils from deprived areas are more likely to attend bad schools. They therefore do not receive as good an education as wealthier pupils who go to better schools. Figure 2.3 clearly shows that this

is true. Indeed, pupils from deprived areas are about as likely to attend a school rated 'satisfactory' or 'inadequate' as wealthier pupils are to attend a school rated as 'outstanding'.

Figure 2.3
Distribution of pupils
by Ofsted rating
(Percentage of pupils)
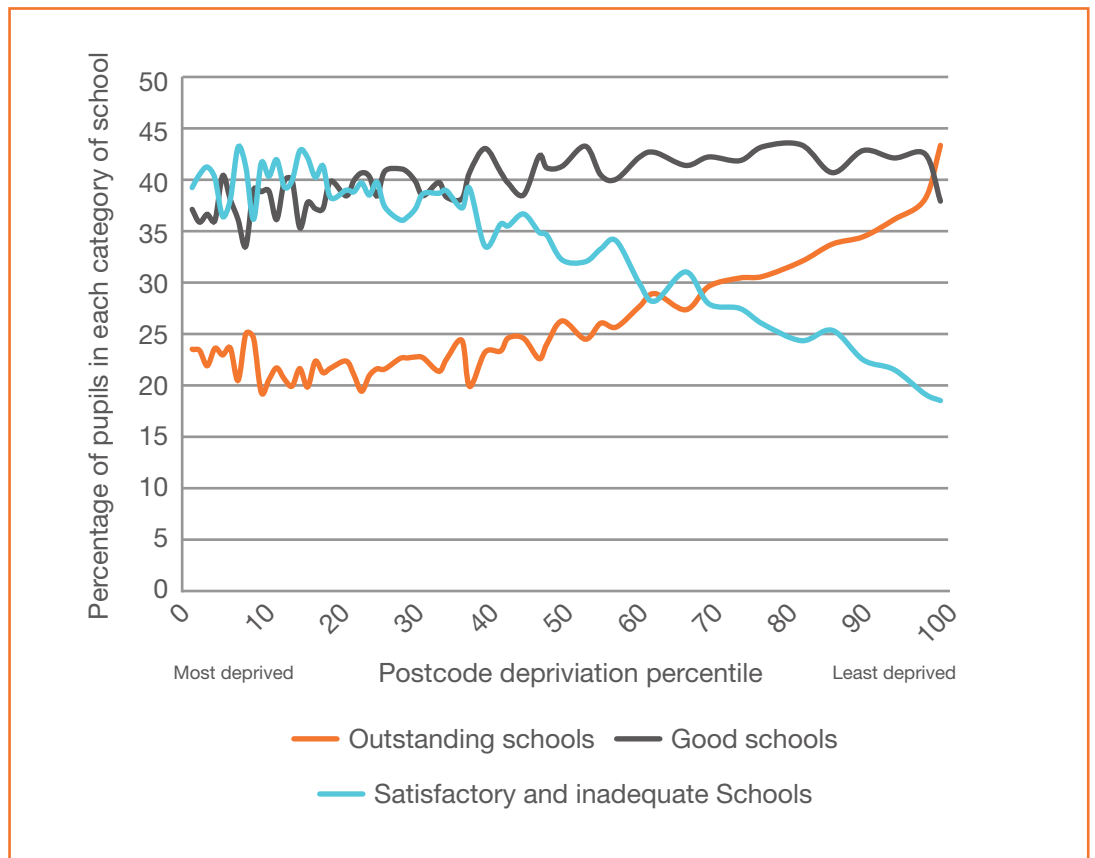
There are a number of explanations for why disadvantaged pupils are concentrated in the weakest schools. Some scholars argue that it is harder to provide high-quality schooling in deprived neighbourhoods, because it is difficult to recruit good teachers and to provide a stable learning environment in the face of disruptive behaviour. Under this logic, having a large intake of deprived students is likely to lead to a lower Ofsted rating, unless the school receives additional support and resources (Lupton 2004).

Others argue that wealthier families are able to sort themselves into the best schools – mainly by buying houses nearby – which means there are only places available for disadvantaged pupils at schools that are underperforming. In a similar vein, some schools have been criticised for manipulating the admissions process to select the brightest pupils (Brooks and Tough 2007).

A third argument is that the accountability system provides insufficient support for and pressure on schools in deprived neighbourhoods to improve (Francis 2011).

There is likely to be some truth in all of these explanations, depending on the context of any particular school. Regardless of which explanation is true, it is clear that, short of a major change in the way the housing market works and how pupils are allocated

across schools, it will be necessary to improve the quality of schools serving deprived areas. This approach lies behind many key government policies. For example the schools inspectorate is putting more pressure on schools rated as 'satisfactory' to improve; schools that are failing are being forcibly converted into academies; and the introduction of free schools is intended to provide a competitive spur for schools to improve. The underlying logic of these policies is that educational inequality can be tackled by a process of school improvement. This was summed up recently by Michael Wilshaw, the chief inspector of schools, who argued that:

> **'[pupils from disadvantaged areas] are the very young people most likely to attend a weak school and receive a substandard education. This is not acceptable any more …'**
> Wilshaw 2012b

The government is right that having a larger number of good schools in disadvantaged areas will improve the results of poorer pupils. Our research shows that pupils in outstanding schools do better than they would have done in a weaker school. For example, pupils in the most deprived quartile of postcodes achieve, on average, around four Bs and four Cs at GCSE in outstanding schools, compared to four Cs and four Ds in an inadequate school. Having access to a high-quality school can therefore make a small but significant difference to a child's academic achievement and life chances.[5]

While policies focused on school improvement can help to raise overall achievement, they will not be sufficient to close the attainment gap between rich and poor pupils. This is because although disadvantaged children get better results in outstanding schools, so do all the other pupils. The overall level of attainment is shifted upwards in these schools, but the gap between rich and poor remains. We can see this in figure 2.4, which shows the attainment gradient for different categories of school. Better-rated schools have higher GCSE results, but even in these schools a substantial gap between rich and poor occurs. This supports analysis by Cook (2012a) who found a similar result when looking at the performance of pupils in schools when rated by the proportion of their pupils achieving five good GCSEs.

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5   The reason that attending a good school does not have a bigger impact on results is because the school attended by an individual accounts for a small amount of the variation in student achievement. We estimate that around 17 per cent of the difference can be explained by whether a pupil goes to a 'good' or 'bad' school. The rest is due to individual-level factors, which will need to be tackled within schools or beyond the school gates.

Figure 2.4
Attainment gradient
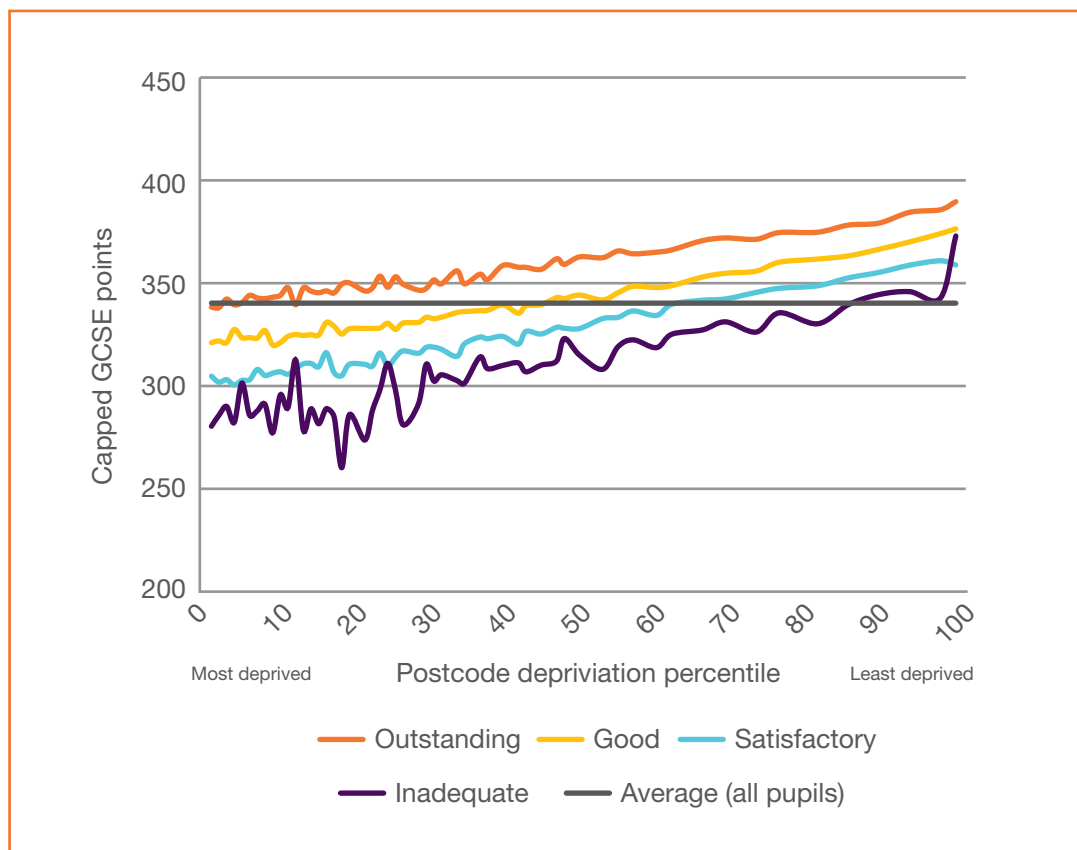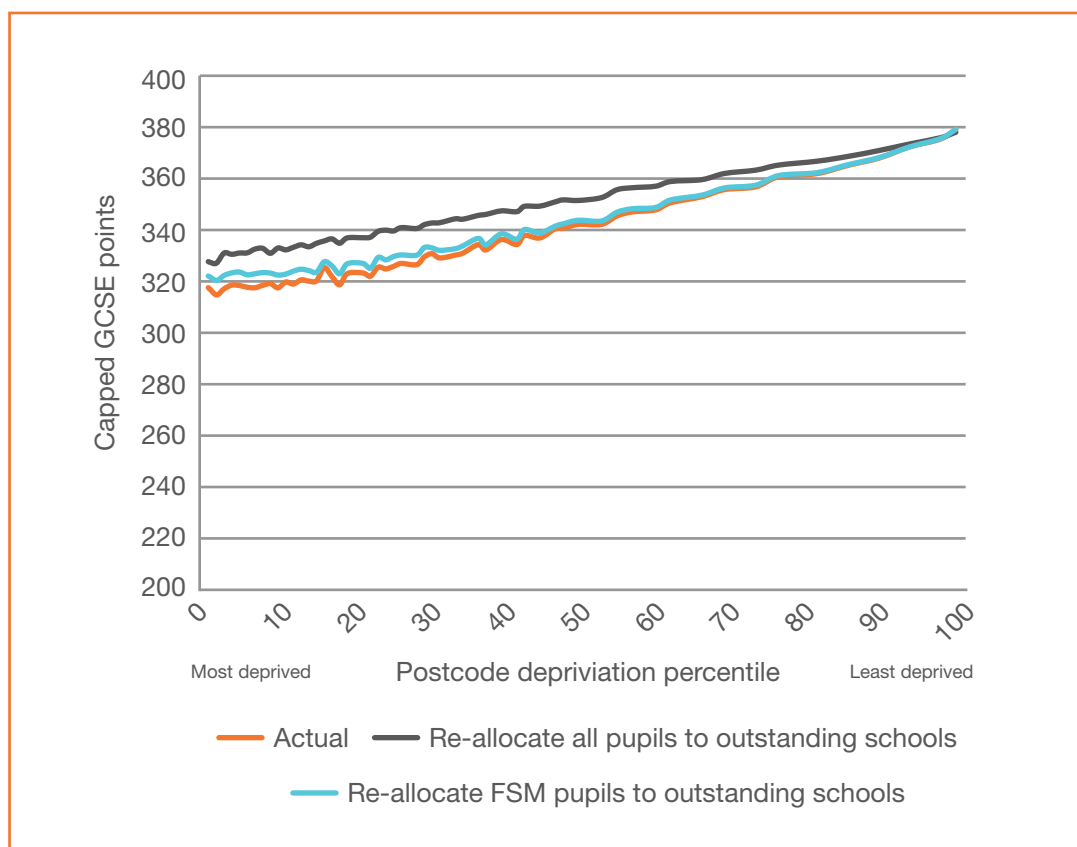by Ofsted rating
(capped GCSE points)

Figure 2.5 models what would happen to the attainment gradient if we relied on 'improving bad schools' as the main policy lever. The blue line simulates what would happen if every pupil on free school meals went to an outstanding school.[6] It shows that the gradient flattens only very slightly. The grey line simulates what would happen if every pupil in the country went to an outstanding school, regardless of social background. We see that there is a flattening of the gradient, but even in this 'ideal world scenario' a steep gradient remains. Even if every school in the country was outstanding there would still be a substantial difference in performance between rich and poor children. The gap between pupils in the most deprived fifth of postcodes and least deprived fifth of postcodes is currently 51 GCSE points. If all pupils attended an outstanding school then the gap would fall to 40 points, a drop of just 20 per cent. This is an important improvement, but clearly a substantial gap remains.

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6   The model is adjusted to reflect pupil-level characteristics such as prior attainment and special educational needs.

Figure 2.5
Simulated effect on
achievement gradient
of reallocating pupils
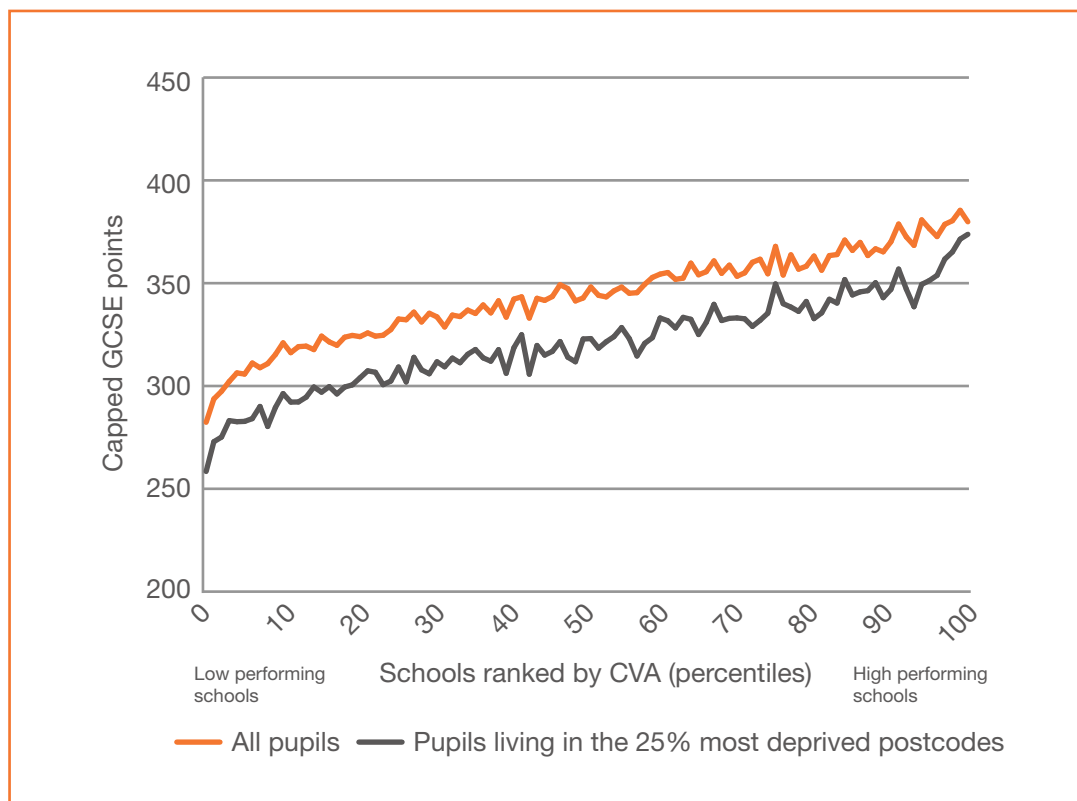to outstanding schools
(capped GCSE points)

There is, therefore, a strong case for improving the quality of schools on the grounds of raising overall attainment. Children who go to schools with a high Ofsted rating are likely to get a better level of education. But improving school quality will only partially help to narrow the gap in achievement between children from different backgrounds. High-quality schools do demonstrate a slightly flatter achievement gradient, but even in these schools a substantial gap between rich and poor pupils occurs. School improvement policies are therefore a necessary, but not sufficient, condition for closing the attainment gap.

2.3 Using the pupil premium and other targeted interventions to narrow the attainment gap

Why targeted interventions are important

The previous section highlighted that 'improving bad schools' will not be enough to narrow educational inequality. This is because an achievement gradient exists even inside high-quality schools. Figure 2.6 shows this problem by comparing the performance of poorer pupils with other pupils in the same school. The horizontal axis ranks schools from the weakest (on the left) to the best, using a school's contextual 'value added' score as a measure of its quality. It is clear that poorer pupils perform worse than wealthier pupils whichever school they are in. Even in good schools (those on the right-hand side of the graph) we see that pupils living in the most deprived neighbourhoods perform worse at GCSE than the rest of their year group.

Figure 2.6
GCSE performance
within schools,
by CVA score
(capped GCSE points)

Figure 2.6 GCSE performance within schools, by CVA score (capped GCSE points)

Low performing schools — High performing schools

Schools ranked by CVA (percentiles)

— All pupils — Pupils living in the 25% most deprived postcodes

Policies designed to reduce educational inequality must therefore focus on tackling the variation in results that occurs *within* each school. This has been described by some as the 'educational holy grail' (Toop 2012 forthcoming). Under this logic, schools should focus on raising the performance of those who are falling behind, for example by ensuring they get the best-quality classroom teaching, giving them more personalised learning, offering catch-up tuition, and using a curriculum that ensures they are engaged. A more detailed book examining the way schools policy can facilitate this will be published by IPPR later in the year.

This focus on pupils who need to 'catch up' is adopted by many successful schools in England. These schools explicitly target pupils requiring rapid catch-up tuition in year 7 by placing them in small groups with special pedagogies focused on literacy and numeracy until they reach the average level of performance for their age group. It is also the approach adopted in high-performing countries, such as Finland.

The systematic attention given to children who are identified as having 'learning needs' is a key feature of Finland's success in international rankings, and it is premised on the idea that individual pupils who are struggling need to be identified early and given appropriate support to improve. This is done is by supplementing their mainstream schooling with part-time small group tuition, provided by a special education teacher. The teachers are highly trained and give pupils an individual learning plan to help them reach the required level. The stigma of attending these classes is reduced by the sheer volume of students taking part – at least one-third of pupils are enrolled in these special classes at any one time, and nearly half of pupils receive some form of catch-up tuition over the course of

their school career. As a result of this approach, within-school variation in Finland is lower than in most OECD countries (Sahlberg 2011: 45–49).

The pupil premium

The government has for a long time acknowledged that schools require additional resources to raise the achievement of disadvantaged pupils; this acknowledgment has taken the form of allocated levels of deprivation funding depending on a school's location and intake. Most recently, schools have been awarded an additional sum of money for every pupil who is eligible for free school meals. This 'pupil premium' is set at £600 for the 2012/13 academic year, though the government has pledged to increase this over the coming years. The intention is that the pupil premium will be spent on interventions that benefit FSM pupils, although headteachers have a high degree of flexibility on how to spend the funds. Giving schools additional resources to raise the achievement of poorer pupils is the right approach to narrowing the attainment gap, as it enables schools to target interventions towards those who are falling behind.

Given the importance of interventions that are designed to raise the achievement of poorer pupils within each school, it is vital that the pupil premium is spent in a systematic and strategic way in order to have maximum effect. However, two concerns have been raised that suggest it may not currently be being put to best use.

First, there is a danger that schools may spend the resources on well-intentioned programmes that, in practice, have not been proven to raise attainment. For example, a recent survey of teachers found that 15 per cent would prioritise the money on reducing class sizes and 8 per cent would spend it on additional teaching assistants (Sutton Trust 2012). However, trials of both these programmes show they have little impact on pupil attainment (Higgins et al 2012a). The same survey showed that less than 3 per cent of teachers would opt to spend the pupil premium on interventions that are proven to be cost-effective, such as peer tutoring, and that one-quarter of teachers didn't know what the money should be spent on at all.

This lack of information and awareness about which interventions are proven to work in terms of raising low achievement suggests that giving schools total flexibility to design their own programmes may not always lead to better outcomes. A more effective approach would be to adopt a 'tight but loose' education policy that prescribes the key features of a programme but leaves an element of flexibility so it can be tailored to fit local circumstances (Thompson and Wiliam 2008).

A second concern is that schools may face pressures to spend their resources on things that are not directly related to raising low achievement (Clifton and Muir 2010). The pupil premium is not ring-fenced – it is an additional sum of money in a school's general budget and is therefore subject to competing demands. At a time of cuts to wider school budgets, and in the face of an accountability system that rewards having a high proportion of pupils achieving five A*–C grades in traditional subjects, schools may opt to use their resources on other things. For example, in the recent survey mentioned above, 8 per cent of teachers said they would use the pupil premium to compensate for reductions elsewhere in their budget (Sutton Trust 2012). Others may decide to focus resources on pupils who are likely to reach the benchmark of five A*–C grades, since this will help them to meet key performance measures, rather than those pupils who have fallen further behind.

There is, therefore, a danger that the pupil premium will not benefit the students who need it most, or that it will be used to fund existing programmes and so not represent anything new or additional for these pupils. While the government has partially addressed this problem by requiring schools to publish how they spend the pupil premium on their websites and by asking Ofsted to survey how the money is spent, this is unlikely to be strong enough to counteract the pressure that some schools face to spend resources elsewhere.

It can therefore be argued that the laissez-faire design of the pupil premium risks seeing it spent in an ineffective and unsystematic way. It is important that the right information and incentives are put in place to ensure schools use the pupil premium to maximum effect. However, the underlying premise of the policy – that the government should allocate additional funds to raise the performance of the poorest pupils within each school – is the right one.

Which interventions are proven to work?

It is important that the pupil premium is spent on interventions that will have the greatest impact on achievement. Given their desire not to micromanage, ministers have tended to ignore the question of what exactly resources are spent on. Discussion of the pupil premium is invariably followed by a vague list of possible interventions, ranging from one-to-one tuition or a longer school day to paying for better teachers or cultural activities (see for example Laws 2010).

In an attempt to fill this vacuum, the Sutton Trust has produced a toolkit identifying which interventions have been proven to be effective at raising achievement (Higgins et al 2012a). The toolkit is a valuable resource for teachers and policymakers, summarising the cost and effectiveness of various programmes that have been properly evaluated.

However, a number of the programmes it identifies are designed to improve the attainment of *all* pupils, rather than specifically to raise the performance of low achievers. Some of the ideas contained in the toolkit, such as providing feedback to pupils, will be important for improving overall classroom practice but will not be sufficient to narrow the achievement gap. The toolkit also notes that the evidence around certain interventions is weak because they have not been subject to trials with a 'control group' that would allow researchers to prove a causal link between the intervention and improved attainment. This lack of research is being addressed by the Education Endowment Foundation, which is funding controlled trials for a number of programmes.[7]

Despite the problems with research in this area, it is possible to identify interventions that have been proven to specifically raise low achievement. Box 2.1 provides examples of interventions that can be used to narrow the achievement gap in schools and gives an idea of how great an impact each can have on pupil attainment.

Understanding the 'effect size' of these interventions enables us to estimate the impact the pupil premium is likely to have on the achievement gap. The effect size is a statistical measure that calculates the average improvement relative to a comparison group, and is presented in a standardised way to allow comparisons between different interventions. An effect size of 0.2 would be typical in education programmes and is roughly equivalent to an additional three months of learning. An effect size of 0.5 would be high, roughly the equivalent to an additional six months of learning. An effect size of 0.8 would be extremely high, and occurs only very rarely in educational research. For a detailed explanation of how effect sizes are calculated, see Higgins et al (2012b).

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7   See http://educationendowmentfoundation.org.uk/

Box 2.1: Targeted interventions and their measurable effects

Intervention	Explanation	Potential effect size*
Small group tuition	Pupils attend short, regular sessions in small groups either during or outside lesson time. Teaching is intensive and targeted to the learners, enabling them to make quicker progress. The most effective sessions are run by a qualified teacher, are linked to classwork and supplement normal lessons. It is important to monitor the progress learners make to ensure the sessions are beneficial. There have been particularly successful programmes targeting 'reading recovery' in primary school. See: Elbaum et al (2000), Burroughs-Lange and Douetil (no date)	0.4–0.5
Peer tutoring	Learners teach each other in pairs to complement existing teaching. This can take the form of cross-age tutoring, where the tutor is older than the tutee, or it can involve learners of the same age taking turns to teach each other. The process improves the learning and self-esteem of both the tutor and the tutee, and there is evidence that low achievers and disadvantaged pupils make the most gains. It requires pupils to be trained in tutoring and timetables need to be coordinated to create space in the day. See: Topping et al (2011), Higgins et al (2012a)	0.45–0.55
Extracurricular programmes	Learners participate in planned after-school activities supervised by adults. These sessions can allow pupils whose home environments are not conducive to learning to study outside school hours. The impact can vary a lot depending on the quality of the programme. Academic improvements are strongest when the programme is linked to the curriculum, well-structured and supervised by qualified staff. Non-academic programmes improve student attitudes but do not raise academic attainment. Low achievers and pupils from low-income families benefit more than others, but it can be more difficult to ensure their attendance. See: Durlak and Weissberg (2007), Higgins et al (2012a)	0.2–0.3

Intervention	Explanation	Potential effect size*
Summer schools	Pupils attend catch-up or enrichment classes during the summer holidays. Summer schools can be targeted at particular pupils and incorporate a range of activities, though for an improvement in attainment they must have an academic focus. The impact varies dramatically according to the design of the programme: the most effective summer schools are tailored to students' needs, involve parents, and incorporate both academic and recreational activities. However, evidence suggests that they are most effective for high achievers and less effective for disadvantaged pupils. See: Terzian and Moore (2009), Higgins et al (2012a)	0.1–0.2
Social and emotional learning	Interventions are made to improve pupils' social and emotional competencies. Strong social and emotional skills improve pupils' work ethic, engagement and commitment to success, whereas those with weak social and emotional skills are more likely to engage in risky behaviour and disengage from education. Interventions can take the form of classroom instruction and peer or family programmes where learners put their skills into practice. See: Payton et al (2008)	0.25–0.35

*Trials of these programmes have shown a large range in effect sizes, depending on how they were designed and implemented. The effect sizes listed here should be treated simply as an illustration of the potential impact a programme could reasonably be expected to have.

While the interventions listed above have been proven to help raise low achievement, it is also important to recognise which programmes have been shown to be ineffective. Most recently, the use of teaching assistants has been shown to have very little impact on pupil attainment, especially when pupils who are falling behind are placed with a teaching assistant instead of giving them sufficient time with a qualified teacher (Blatchford et al 2009). Similarly, setting pupils by ability can have a negative impact on low achieving pupils (Higgins et al 2012a). Despite the popularity of smaller class sizes, this has also been shown to have a relatively small impact on pupil achievement compared to the cost involved (Whitehurst and Chingos 2011). It is therefore vital that resources are not used on interventions that, despite their intuitive appeal, have been shown not to improve learning.

Of course, the effective interventions listed here do not come cheap. Schools are balancing tight budgets and will have to ensure that they get the most value for money from these programmes. The most effective interventions identified above – small group tuition and peer tutoring – are reasonably expensive. The government has pledged to continue to increase the size of the pupil premium over the coming years. It is essential that this increase takes place, to ensure that schools can afford the most effective interventions.

Why one-off interventions are not enough

The interventions outlined in box 2.1 have been proven to have a measurable impact on pupil achievement. However, it is important to remember that many of these are temporary interventions and so their benefits can fade over time. If a pupil is given one-to-one tuition in year 7, for example, then that might bring them up to the average performance for their year group in the short term, but this gain could be eroded in subsequent years if they forget what they were taught or start to fall behind again. The problem of 'fadeout' was most famously noted in an evaluation of the Head Start programme in the US, which found that impressive gains from an early years intervention programme were gradually eroded once children went on to study at primary schools in deprived neighbourhoods (Currie and Thomas 1995, Ludwig and Phillips 2008). This phenomenon was also noted in programmes that required pupils to repeat a year and with the impact of effective teachers (Jacob et al 2008).

There are many reasons why an intervention might not have a lasting impact on pupil attainment. One explanation could be that the programme is designed badly. For example, if a child is taught to memorise key facts and processes, rather than gain a deeper understanding of the material, then they may forget what they have learned over time. Another possible explanation is that the child is placed in a difficult environment after completing the intervention – they might be placed in a classroom where the teacher focuses on other pupils at their expense, for example. A third explanation is much simpler: some children may need consistent support to help compensate for the challenges they experience at home.

The evidence on fadeout has two implications for teachers and policymakers. First, interventions need to be designed to have a long-lasting impact and not just to boost short-term achievement – for example, interventions should help students to understand subject matter rather than 'cram' for a particular test. Second, interventions might need to be sustained over the course of a pupil's school career – it is not sufficient to rely on one-off interventions that bring a pupil up to the same level as their peers, as these gains could be undone once support is removed.

What impact will interventions targeted at pupils who are eligible for free school meals have on the achievement gap?

Section 2.3 argued that targeted interventions are an important way to narrow the achievement gap because they help to tackle the variation in pupil performance within each school. The pupil premium will be an important policy tool for bringing this about, so long as it is used in a systematic way on interventions that are sustained over time.

What is not clear is just how big an impact these programmes will have on the overall problem of low achievement in this country. Will they be sufficient to close the gap?

It is possible to answer this question by taking what we know about the effect sizes of different interventions and modelling their impact on the attainment gradient. Figure 2.7 simulates what the attainment gradient would look like under different scenarios.

Since the pupil premium is designed to fund interventions for pupils who are eligible for free school meals, the model has only applied the different effect sizes to that group of pupils. It is important to note that this graph is only illustrative. There are inevitably a huge number of uncertainties about the impact different programmes could have on attainment; chief among them is the fact that we do not know how many schools already use these interventions. Many schools, for example, already use small group tuition, and so existing academic results will already reflect that, meaning that any additional benefits from extra tuition will be small. Nevertheless, this is a useful exercise to help policymakers gauge the extent to which they can rely on interventions targeted towards FSM pupils to close the achievement gap.

Figure 2.7
Simulated effect of interventions for FSM pupils on the attainment gradient (capped GCSE points)
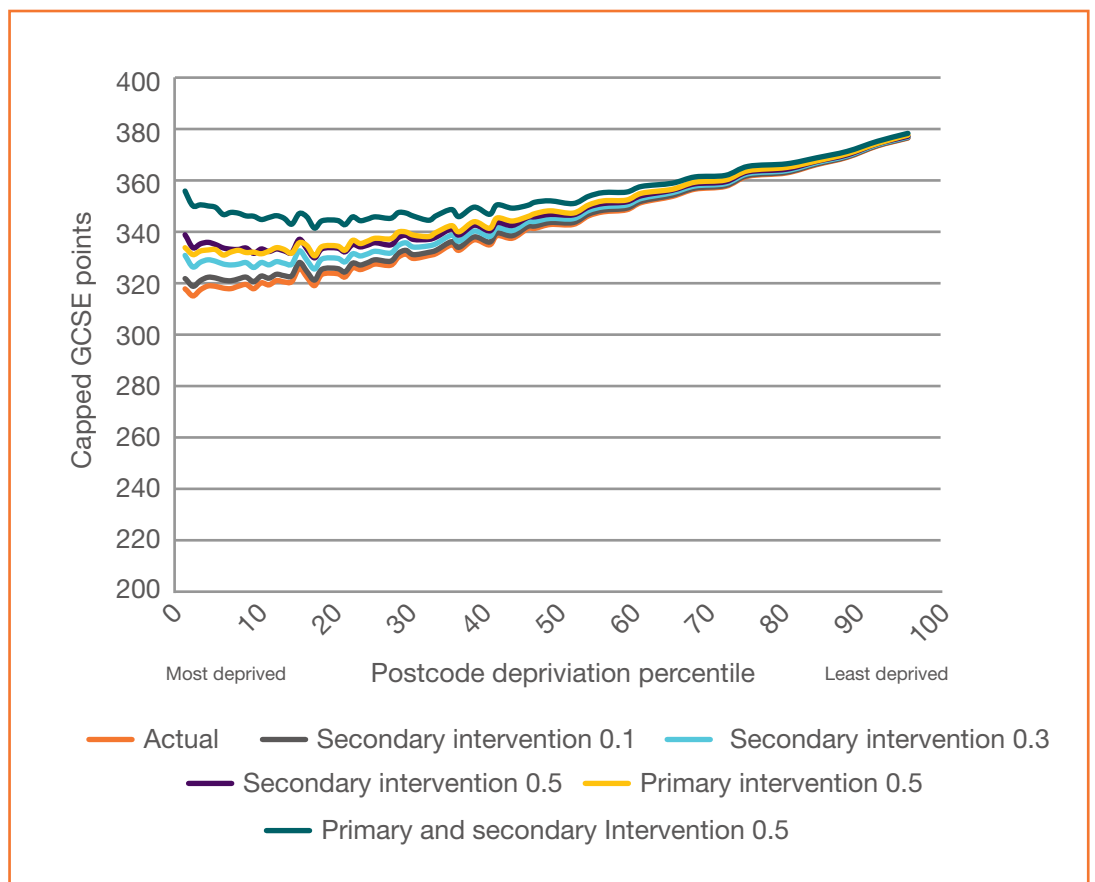
This chart shows what effect size would be required to achieve various improvements in the attainment gradient. The orange line is the actual gradient, and it gradually improves (flattens) as larger effect sizes are applied. The graph models effect sizes that are applied only at secondary school (the grey, blue and purple lines) to give an indication of what

would happen if we rely on interventions in secondary schools to close the achievement gap. The graph then models the impact of interventions at primary school (the yellow line) and the impact of combining interventions at both primary and secondary school (the green line).

It is clear that targeted interventions for FSM pupils could have a significant impact on the achievement gradient. For example, an intervention with an effect size of 0.5 across all eight GCSE subjects – which could be achieved through a highly effective one-to-one tutoring programme or peer learning – could help to flatten the line for the most deprived quarter of postcodes. If this was accompanied by a similar-sized intervention in primary school, then the attainment gap between the richest and poorest fifth of households would be less than half its current size.

While targeted interventions hold a lot of potential to narrow the attainment gap, there are three important things to note from figure 2.7.

- First, it shows that targeting interventions towards FSM pupils would significantly help to raise attainment in the poorest quarter of postcodes but it would not help to reduce the attainment gradient that exists in the remaining three-quarters of the country. Of course, improvements for the very poorest pupils are vital – the potential gains shown in this graph would ensure they receive a sufficient level of education to progress in life – but they will not be enough to break the wider link between household income and success at school. This suggests that interventions should not just be targeted towards pupils who receive free school meals as the pupil premium currently dictates, but instead more widely at those pupils who are falling behind at school. This is the approach adopted in world-class systems such as Finland's, which target pupils according to their learning needs as opposed to their family background (Sahlberg 2011). Crucially, it would enable England to tackle the high number of pupils with very low achievement irrespective of their socioeconomic background, a problem that prevents its education system from being both excellent and equitable.

- Second, the graph shows that interventions at secondary school cannot do all of the work in narrowing the attainment gap. The biggest effects will be achieved when interventions start in primary school and are sustained into secondary school. It is therefore necessary for policymakers to tackle the attainment gap at all levels of the school system.

- Third, it shows that interventions need to have a large effect size, of around 0.3–0.5, to substantially narrow the gap. This effect size would have to apply across all eight GCSE subjects if it was to produce the modelled gains. As the programmes listed in box 2.1 show, the most effective interventions have been shown to produce this level of improvement, so long as they are properly designed and implemented. Nevertheless, it is reasonable to assume that not all programmes implemented as a result of the pupil premium will be quite so effective, and they will not necessarily have the same effect size in all GCSE subjects.

In summary, targeted interventions do hold a lot of potential to narrow the attainment gap in schools. A rough estimate suggests that the most effective interventions, such as small group tuition and peer tutoring, could halve the gap between the richest and poorest students if they were implemented effectively. However there are concerns that the design of the pupil premium means it will not be used to maximum effect, and that it will be too narrowly focused on FSM pupils. Policymakers cannot rely solely on interventions funded

by the pupil premium to deliver the size of improvements that are required to break the link between poverty and educational attainment.

2.4 How the attainment gap can be closed: a whole-system approach

The previous section has argued that targeted interventions in schools could make an important contribution to narrowing the attainment gap but that they cannot do the whole job. If the government relies solely on schools to tackle this problem then the 'effect size' of interventions would have to be very large to achieve the gains that are needed. However, if we expand our analysis to include interventions in the early years – before children start school – then a more optimistic picture emerges.

The early years are an important phase of a child's life, laying the foundation for future learning. Evidence from birth cohort studies shows that there is already a substantial gap in cognitive ability between richer and poorer children by the time they start primary school, largely as a result of the different environments they are raised in (Feinstein 2003). If these early inequalities could be reduced then that would relieve some of the pressure on schools to compensate for these problems later in life.

There has been a welcome interest in the role of early years services in recent years, following the introduction of Sure Start centres in England and evidence of successful programmes overseas (Esping-Anderson 2009, Ben-Galim 2011). Detailed studies of preschool education show that it can help to raise cognitive development and prepare children for a better start at school, compared to those children who stay at home (Sylva et al 2004, Fairholm 2011, Ludwig and Phillips 2008). The most effective programmes involve children spending at least three years in a preschool setting with high-quality staff and a mixture of children from different socioeconomic backgrounds. What's more, the benefits of these programmes were found to remain with children well into primary school, meaning those who missed out on the service continued to be 'left behind' later in the school system (Sylva et al 2004).
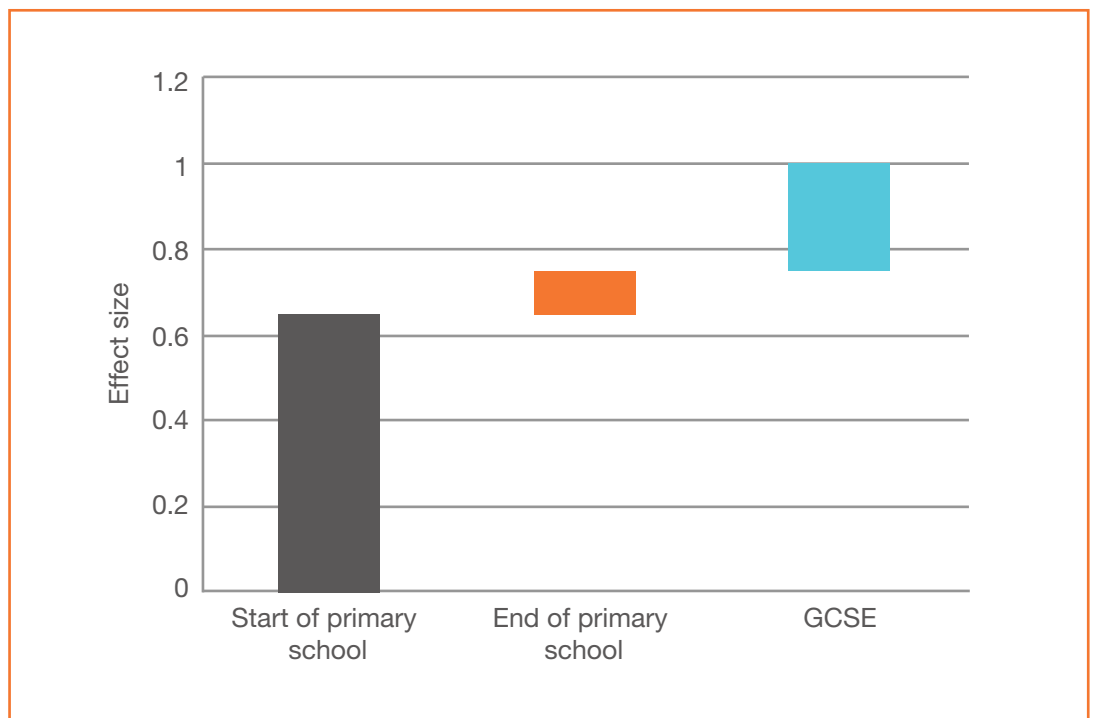
Interventions in the early years can therefore be an important tool for the government to use in aiming to eradicate the achievement gap. Figure 2.8 provides an estimate of the effect sizes that would be required to close the achievement gap at each stage of the education system once preschool has been included in the analysis.[8] It shows that if the achievement gap is eradicated by the start of primary school, much smaller interventions would be needed to sustain these gains. The starting point for the graph is the idea that policymakers should focus on closing the attainment gap at each stage of the system: in the early years, in primary school *and* in secondary school, rather than relying on interventions in secondary school.[9]

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8   For the analysis in figure 2.8, we calculate the effect size required to close the gap in achievement between FSM pupils and non-FSM pupils. We use this measure because that is the main goal the government refers to when stating its desire to close the achievement gap. However, as discussed earlier in this report, this is a rather narrow measure of educational inequality.

9   Note that the chart is for illustration purposes only, to indicate the scale of the challenge at each stage. Effect sizes cannot be added to obtain an 'overall effect size required' as the attainment at each stage is not measured on a comparable scale.

Figure 2.8
Effect size of
interventions required at
each stage of the school
system to close the
attainment gap

This chart shows that eradicating the achievement gap in the early years would require interventions with an effect size of 0.65. Previous research into the impact of early years programmes shows that this would be ambitious but possible. In the US, for example, the Boston public schools pre-kindergarten programme had an average effect size of 0.62 in reading and 0.59 in numeracy, and the impacts were even larger for children who were eligible for free lunches (Weiland and Yoshikawa 2012). This programme involved a significant investment of city resources in the quality of preschool provision, including in curricula, coaches and training. The teachers for the programme were paid on the same scale and were subject to the same recruitment processes as school teachers. An evaluation of the programme supported this significant public investment, given the large impact it had on literacy and numeracy (ibid). Reviews of preschool education in England have also found large gains: 0.55 in numeracy and 0.49 in reading (Sylva et al 2004).

If the gap in attainment that exists at the start of primary school can be eradicated then it would relieve much of the pressure on the rest of the school system – but it would not let schools off the hook. Interventions have to be sustained over the course of a child's school career to ensure they do not fade out. Interventions with effect sizes of 0.1 in primary school and 0.25 in secondary school would still be required to keep the gap closed at those stages. Improvements of this size are possible for schools to achieve, provided they focus their resources and attention appropriately and ensure the benefits of an intervention are not allowed to erode over time. Crucially, they are much more easily achievable than the effect sizes that would be required without early years interventions. In that case, primary schools would be required to make an intervention with an effect size of 0.55 to close the achievement gap at age 11, which is a far greater challenge.

The evidence presented here suggests that policymakers should therefore take a 'whole-system' approach to narrowing the attainment gap, viewing it as a set of interventions

that span across a child's lifetime. This has implications for how schools choose to spend their pupil premium: this should be viewed as a budget to be spent across a child's whole school career, in order to bring about sustained improvements among the lowest achievers. This runs counter to the pressures created by the school accountability system, which incentivises schools to spend additional resources on one-off interventions that boost the performance of pupils close to the C/D performance threshold in their GCSE years.

Closing the achievement gap is clearly a major and longstanding challenge that has plagued education systems around the world. However, the evidence presented here – which compares the size of the attainment gap with the effectiveness of interventions – suggests that it can be done. But continuation is the key: rather than one-off interventions targeted at odd points of a child's school career, closing the gap will require a sustained series of interventions from the early years right through to secondary school, for as long as a child is learning.

3. CONCLUSIONS

Over the last few decades, education has become increasingly important for finding a decent job and leading a good life. Achieving high grades at school can open the doors to further education and a professional career, while those with low grades find it increasingly hard to get on in life. In this context, it is important that every child has an equal opportunity to succeed at school, regardless of their family background.

Sadly, too many children in England are denied this fair start in life. Last year 34 per cent of pupils eligible for free school meals achieved five good GCSEs, compared to 62 per cent of pupils from wealthier homes. Despite notable improvements since the turn of the millennium, there remains a strong causal link between a child's family income and their educational achievement. Furthermore, the recent onset of recession and increase in child poverty could be making the situation worse, undoing any previous gains. Thousands of children are being let down and having opportunities denied simply as a result of where they live.

England performs much worse than the world's leading education systems in this regard. International comparisons show that the top performing countries are both more equitable and have a far smaller proportion of students performing at a low level. A fifth of UK students failed to reach basic proficiency in the latest PISA assessment, compared to just ten per cent among the top performers. Addressing these two challenges – breaking the link between social class and educational achievement, and raising low achievement – hold the key to raising England's position in international rankings.

While the causes of low attainment lie beyond the education system, it is schools – more than any other institution – that can help to level the playing field so that all children get a fair start in life. This paper has explored the role schools can play in narrowing the achievement gap. The logic behind much government policy in this area is that 'having better schools' will be enough to break the link between poverty and attainment. However our analysis presents a more complicated picture. While school improvement policies are important for raising overall standards in the system, they will not be sufficient to narrow the gap between rich and poor children. This is because even in outstanding schools attainment remains linked to a child's family background, albeit to a lesser degree than in weaker schools.

Narrowing the attainment gap will therefore require more than whole-school improvement. It will also require schools to target individual interventions that help reduce the variation in performance within their school. This finding supports the introduction of the pupil premium, which could be used to fund these sorts of interventions. However there is a risk that schools will use these resources to fund programmes that, while improving the school, will do little to reduce educational inequality within it. The design of the pupil premium means it will not be used to maximum effect.

If used effectively, targeted interventions could close the attainment gap between rich and poor pupils. Our analysis of targeted interventions – which compared the size of the attainment gap with the effectiveness of the interventions – suggests that they could close the gap. However it will require a sustained package of interventions from the early years through to secondary school, as opposed to one-off interventions targeted at odd points of a child's school career.

If England is to create a school system fit to compete on the world stage, it must focus on two related challenges: raising the performance of the lowest achievers and breaking the link between family income and educational achievement. The evidence from

world-leading systems shows that excellence in education can only be achieved through having an equitable system. This paper has set out what it would take to achieve this aim. There is no magic bullet, but a combination of early years support to ensure every child starts school at the same level, coupled with sustained interventions at primary and secondary school to prevent falling behind, alongside a programme of continued school improvement, would ensure that the attainment gap between rich and poor would disappear.

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APPENDICES

Appendix A: Interpreting GCSE points scores

In order to derive a measure of pupil achievement, we identified a pupil's best eight GCSE grades and converted them into an overall points score. This table gives a breakdown of the official point scores for each grade at GCSE. The maximum points in our analysis was therefore 464, or eight A* grades.

Table A1
Points value of GCSE grades

Grade	Points per subject	Total points for eight grades at this level
A*	58	464
A	52	416
B	46	368
C	40	320
D	34	272
E	28	224
F	22	176
G	16	128

Appendix B: Analysis of attainment gaps excluding equivalent qualifications

There has been some debate among policymakers about the use of 'equivalent qualifications' when analysing educational achievement. Some studies give vocational qualifications an equivalent number of points to GCSEs so that they can be included as a measure of achievement. Others exclude vocational qualifications from their analysis because they believe they do not represent the same level of achievement as taking a GCSE, and that schools have used them to artificially boost their position on league tables.

As noted in box 1.2, we conducted our analysis using both methods. The results presented in the main body of the paper use the measure of GCSEs including equivalent qualifications.

In this appendix we repeat the same analysis using the measure of GCSEs excluding equivalent qualifications. The graphs have been numbered and titled in the same way as their counterparts in the main body of the paper, to enable easy comparison.

The graphs presented in this appendix show that when equivalent qualifications are excluded the gap appears larger. This suggests that vocational qualifications have been disproportionately used for pupils from poorer homes. While the size of the gap is bigger, the overall trends and patterns remain similar whichever method is used. We are therefore confident that the findings presented in the main body of the paper are not affected by the fact that equivalents were included in the analysis.
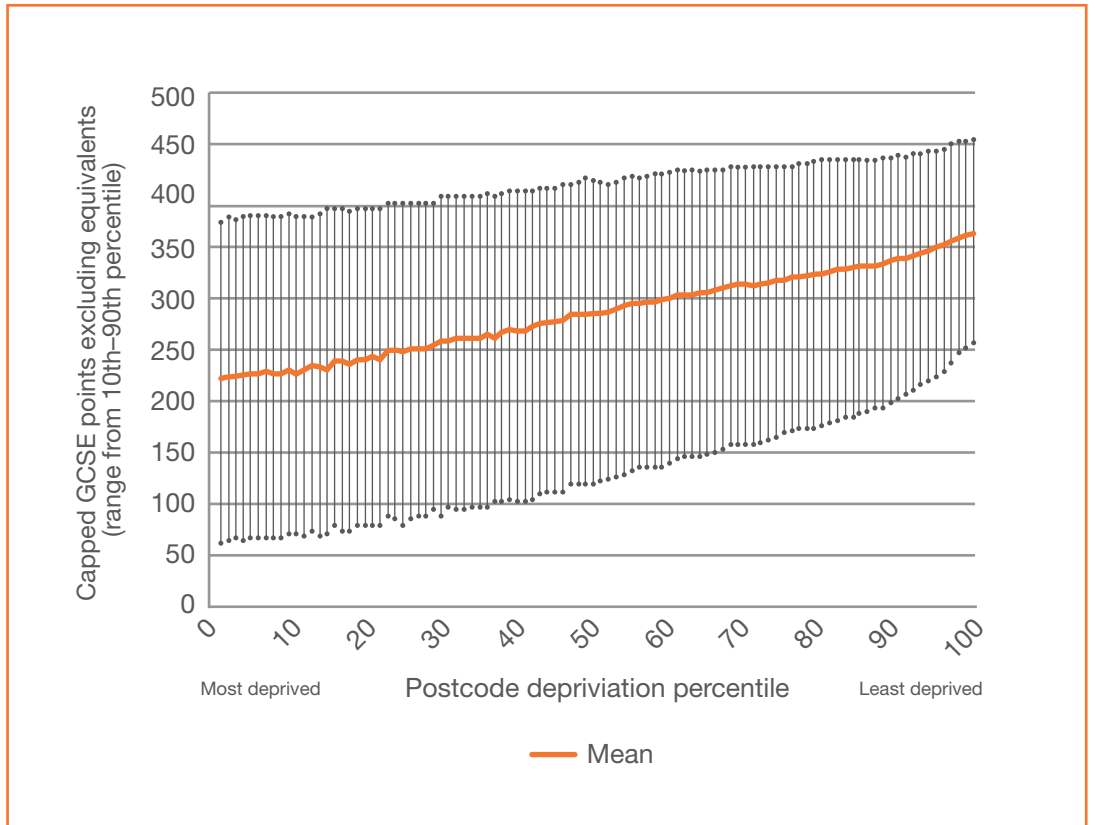
Figure A1.1
Capped GCSE points by postcode deprivation, excluding equivalents
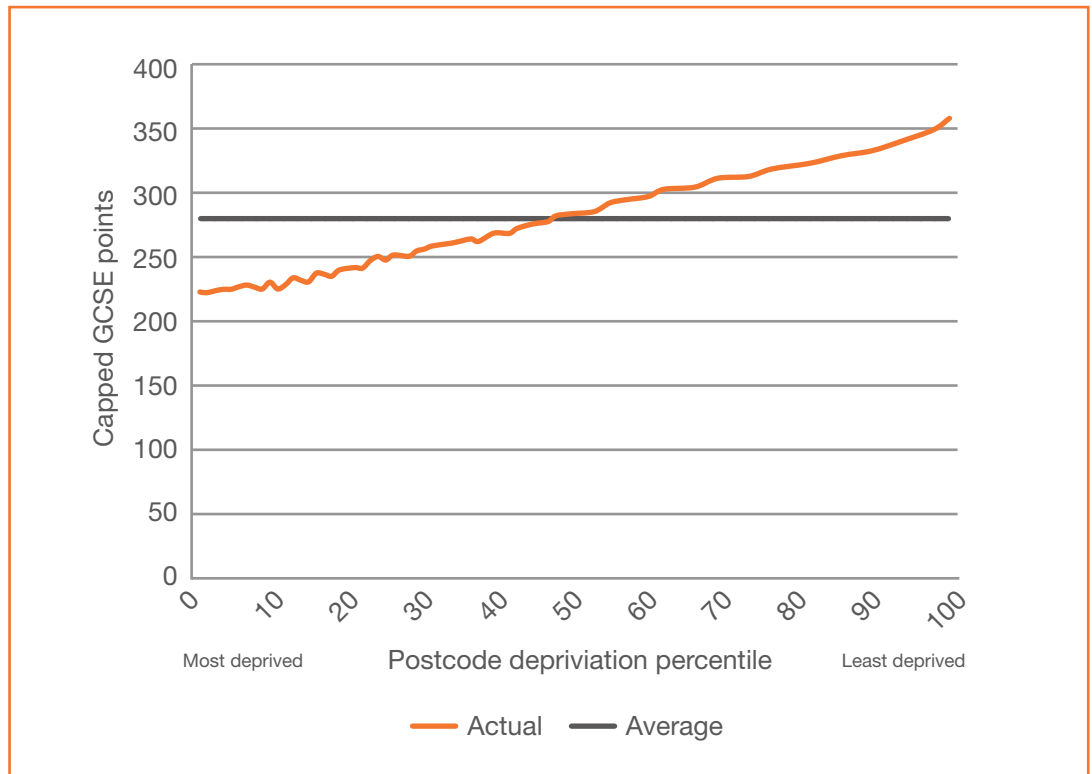
Figure A1.2
Effect of SEN pupils on attainment gradient (capped GCSE points excluding equivalents)
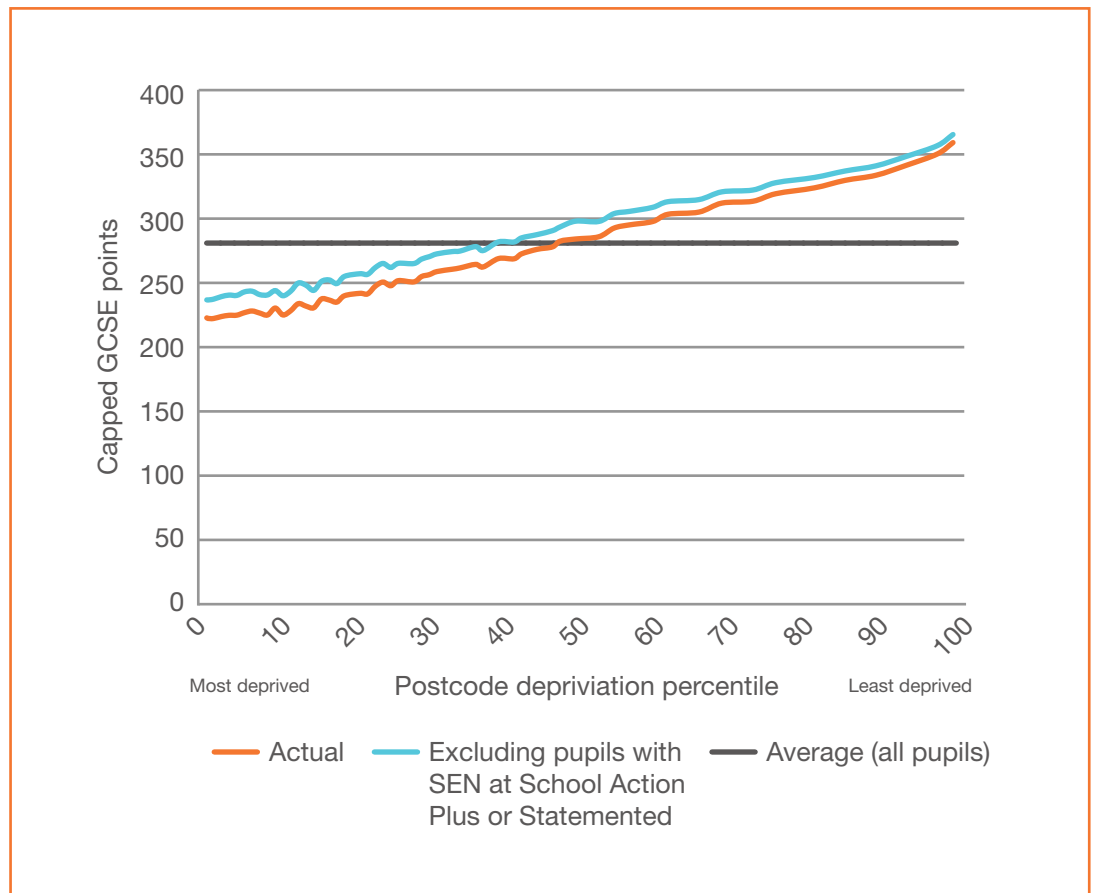
Figure A1.6
Variation in pupil
performance at GCSE,
by postcode deprivation
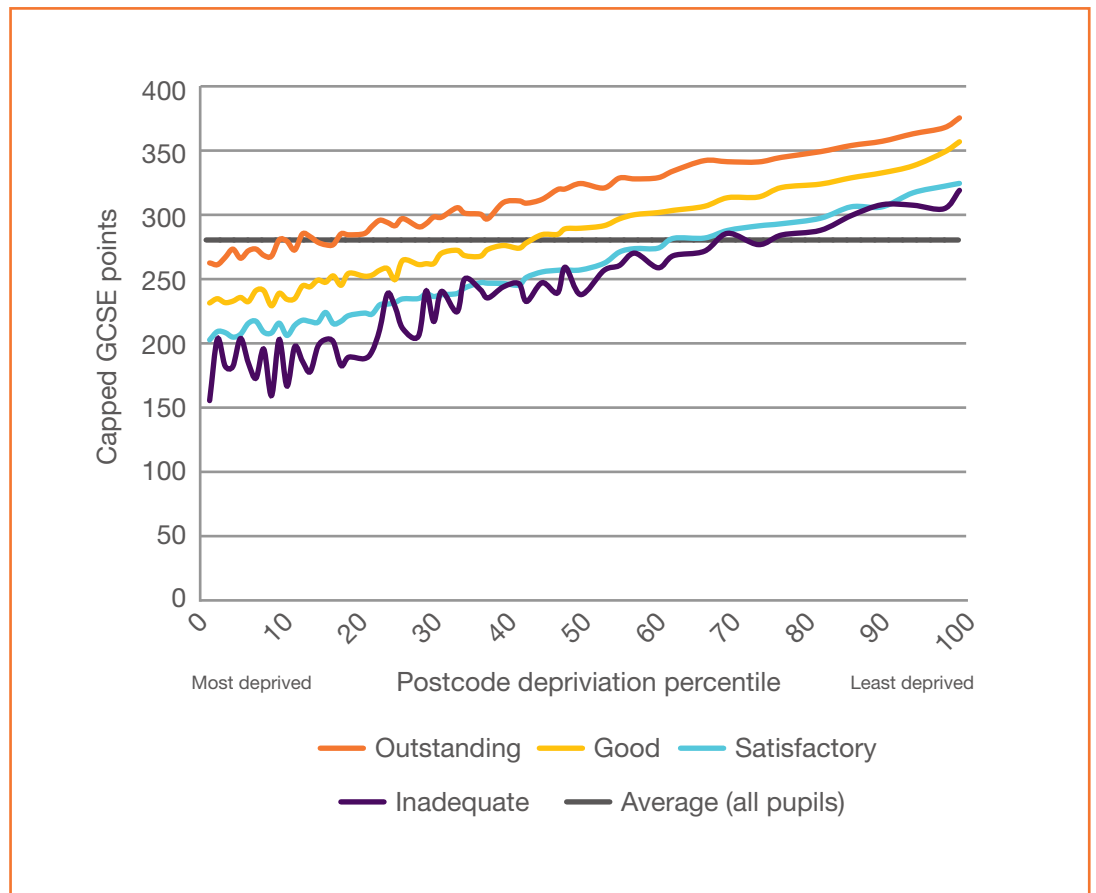(capped GCSE points
excluding equivalents)

Figure A2.2
Attainment gradient if progress over secondary school was equalised for all pupils to the average level of progress (capped GCSE points excluding equivalents)
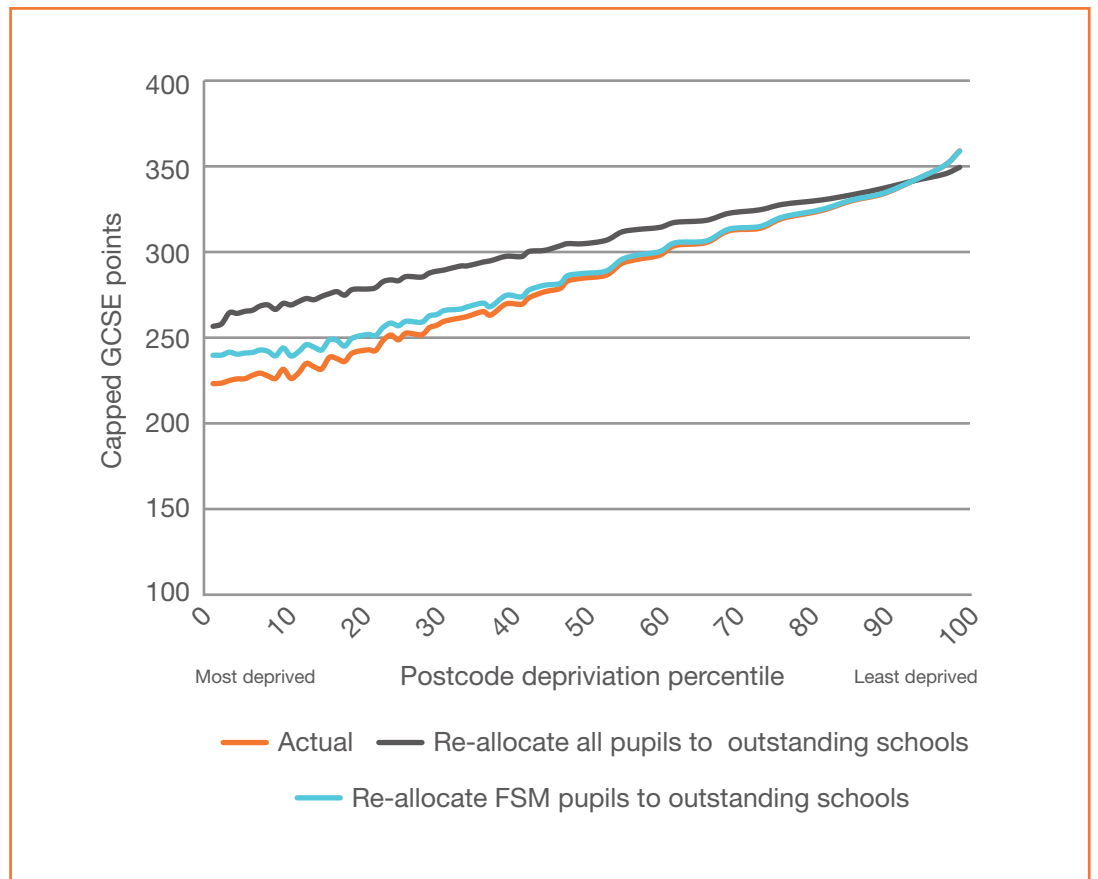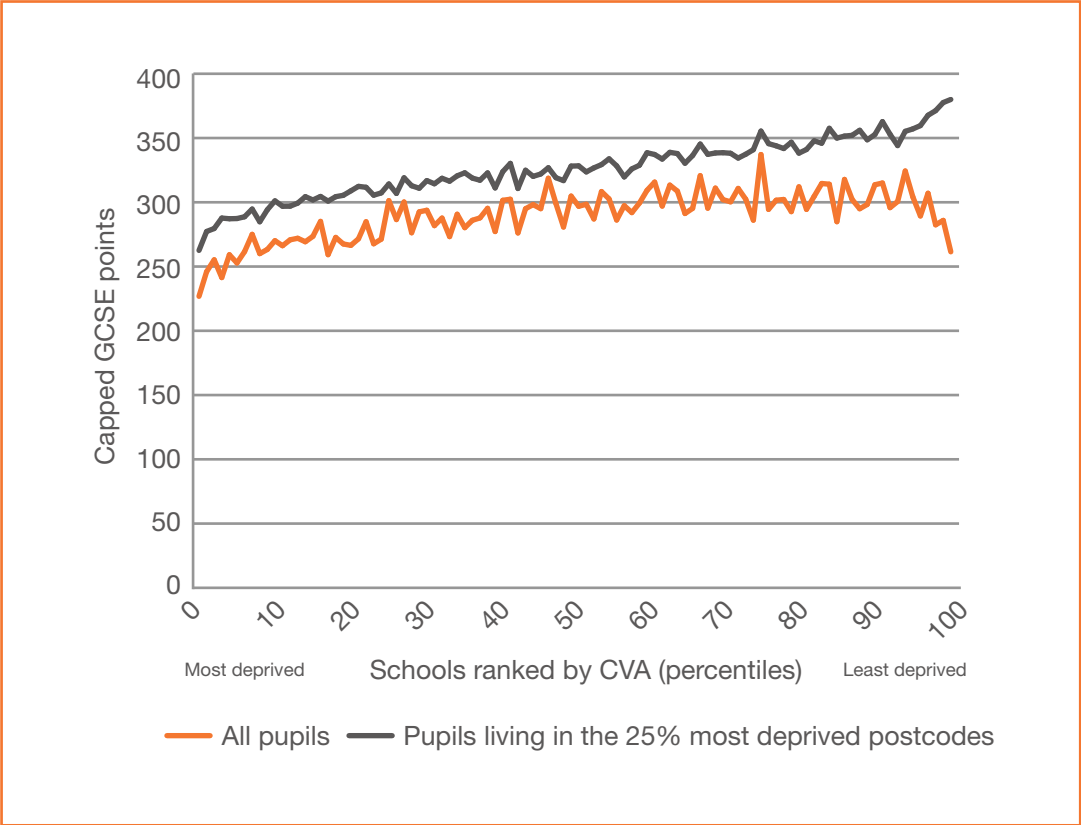
Figure A2.4
Attainment gradient
by Ofsted rating
(capped GCSE points
excluding equivalents)

Figure A2.5
Simulated effect on achievement gradient of re-allocating pupils to outstanding schools (capped GCSE points excluding equivalents)

Figure A2.6
GCSE performance
within schools,
ranked by CVA score
(capped GCSE points
excluding equivalents)

Schools ranked by CVA (percentiles)

Most deprived   Least deprived

— All pupils   — Pupils living in the 25% most deprived postcodes

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