

## How intake and other external factors affect school performance

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The purpose of this review is to present the evidence for the factors that influence pupil attainment and the extent to which the performance of schools reflects these factors. Increasing school performance and reducing educational inequalities remain central policy objectives in English education.

With the advent of the 'pupil premium' policy, there has been increased focus on what schools might do to lessen the effects of pupil background factors, and this review provides an overview of the effective interventions that teachers, schools and policymakers may consider.

### Key points

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- School performance as measured by both exam scores and Ofsted ratings is strongly related to the prior attainment and the socio-economic background of a school's intake.
- The strongest determinants of pupil attainment are located at the individual pupil level and at the family level. This is not to say that schools are not important but, once intake characteristics are controlled for, variation in school performance is not large.

- There is a limit to what can be done to break the link between pupil background and attainment by interventions directed at whole school improvement.

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- Some *pupil* level interventions have been demonstrated to produce gains in attainment for disadvantaged pupils; for example, there is robust evidence of the efficacy of pre-school interventions in breaking the link between background and attainment. However, effective teaching and learning is a complex activity that cannot readily be reduced into simple interventions.

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- The most effective interventions are those that start early and are sustained over the course of a pupil's school career.

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- Schools do not operate in a vacuum and some of the influences on pupil attainment, such as maternal health and wellbeing, family income, parental job security, the socio-economic mix of peers and access to thriving labour markets, imply measures that are much wider than those that have hitherto been the focus of education policy.

## **1 The relationship between school intake and school performance**

### **1.1 Attainment measures of school performance**

Estimates of the so-called 'school effect', that is the percentage of a pupil's attainment that is attributable to the school attended, tend to range from around 10% - 20% (Ainscow et al, 2010). The most comprehensive estimate of the relative influence of individual, family, neighbourhood and school-level factors suggests that school-level factors make up 19% of pupils' GCSE grades (Rasbash et al, 2010).

Dividing the school effect between the effect of the secondary school and the lasting effects of the primary school attended, the secondary school

attended is estimated to make up just 10% of a pupil's GCSE grades; the corresponding proportions attributable to the family context and individual pupil level are 40% and 38% respectively, with primary school and local area effects making up the rest.

Unsurprisingly, then, school performance in England can be quite accurately predicted simply from observing the intake characteristics of a school. The most dominant of these characteristics is the prior attainment of a pupil. Various attempts have been made to devise alternative school performance measures that control for intake factors. For example, measures of 'Contextual Value Added' (CVA) were introduced that attempted to adjust a school's performance score based on the pupil intake characteristics. However, these were poorly understood by schools and parents (see *TES*, 2011a). Revealingly, CVA measures of school performance found that once prior attainment and other pupil intake characteristics are controlled for the performance of the vast majority of schools is statistically indistinguishable from one another and a school's CVA measure is a poor guide to school performance in subsequent years (Leckie and Goldstein, 2009; Gorard et al, 2013).

Beyond the exam-based school performance measures, schools also are rated by Ofsted inspections that ostensibly give regard to a school's intake and context in judging its quality. As figure 1.1 on the next page shows, however, Ofsted judgements are also strongly dependent on the pupil intake characteristics of a school, i.e. factors over which the school has no control. Whether this is because pupils in more disadvantaged areas are served by less effective schools or because having a disadvantaged intake makes it more difficult to score highly on the measures by which Ofsted assesses schools is further considered in section 2.2.

## 1.2 Schools that 'beat the odds'

It is important to emphasise that the above findings do not signify that schools are not key institutions in increasing educational attainment and improving life chances. It is more that *comparing schools against each other* reveals very little in terms of differential performance between schools and that, on average, school performance stubbornly reflects the socio-economic characteristics of pupils within a school.

Some schools do seem to be successful despite having a disadvantaged intake. However, care must be taken in simply identifying such schools through looking at the attainment of, say, FSM pupils, as FSM pupils are not a homogenous group and, as such, their performance may vary for reasons other than the school they attend. Furthermore, the model of analysing

such schools to discover 'best practices' that can be applied more widely is largely discredited (Collins, 2012; Hanushek, 2004; Lupton, 2004). Identifying schools that truly 'beat the odds' and, perhaps more importantly, how they do so can also be hampered by opaque admissions policies (West and Hind, 2003; Ainscow et al, 2010), favourable funding arrangements (Gorard, 2005) and attempts to 'game the system' with regard to exam results (Jin et al, 2011).

In the USA, extensive research has been done on how schools can reverse the effect of economic deprivation (Curto et al, 2011). The studies tend to find that schools that appear to reduce the relationship between pupil background and attainment rely on strategies that are resource intensive and difficult to scale up, such as higher teacher quality and longer school days. There is also evidence that part of such schools' success is due to covert selection of pupils in the admission procedures.

### **1.3 England in the international context**

England is not alone in having a problem with pupil background determining pupil performance. Such a relationship is observed across all OECD countries (OECD, 2012). However, a number of indicators suggest that, compared to other countries, the relationship between pupil background and attainment is stronger in the UK. The UK is particularly conspicuous in having a low proportion of pupils from disadvantaged backgrounds reaching the highest levels of attainment (Jerrim, 2012), which may possibly be linked to the high degree to which schools in the UK are segregated along socio-economic lines.

## **2 Towards a better understanding of pupil performance**

School performance is strongly related to intake characteristics, firstly because school performance is simply an aggregate of *pupil* performance, which is in turn generated by many different non-school factors, and secondly because of the way the mix of pupils within a school may affect how effective the school can be. These influences are reviewed below.

### **2.1 Neighbourhood and community level influences**

The community within which a pupil is raised and educated has been found to have effects on their educational attainment, though these are small in comparison to other factors.

Gibbons (2002) finds that higher levels of education amongst adults in an area positively affects the level of educational attainment of pupils in that area, over and above a pupil simply having more educated parents. Concentrated poverty and crime in an area has also been found to affect individual pupils' test scores negatively, independently of school, family and pupil factors (Burdick-Will et al, 2011). Depressed labour markets may also affect pupil effort and therefore attainment. The identified 'arc of underachievement' (TES, 2011b) of local authorities in England with lower than average performance does not have a simple direct correlation with economic deprivation but seems more closely to reflect a lack of access to labour market opportunities, as in coastal towns for instance (Ofsted, 2013).

## 2.2 School level influences

The relationships shown in figure 1.1 can be used to argue that schools serving disadvantaged areas are of poor quality, with the implication that such schools should be the main focus of school improvement policies.

Such an interpretation is, however, more problematic than would first appear as it is difficult to separate out whether there are more less-effective schools in disadvantaged areas or that having a disadvantaged intake *causes* the school to be less effective. In a study of schools serving disadvantaged areas, Lupton (2004) found that the characteristics of the school intake disrupted the focus on learning within a school and Allen and Burgess (2010) argue that effective schools are generated, in part, by favourable pupil intake characteristics that lead to more engaged parents and higher quality staff.

Indeed the quality of individual teachers appears to be more important than the overall quality of the school in determining outcomes (Sutton Trust, 2011) and not only do schools serving disadvantaged areas tend to attract teachers with less experience but the turnover of teachers is higher (Allen et al, 2012), which possibly leads to disrupted learning (Ronfeldt et al, 2011). Beyond the quality of teachers, research points towards teacher expectations of their pupils as an important influence on pupil performance (Rosenthal and Jacobson, 1968), which in turn can be shaped by the socio-economic background of the pupils.

Of all the potential influences on a pupil's performance, the effects of different peer group compositions within a classroom is perhaps least well understood (Hoxby, 2000). There is evidence though that pupils' attainment benefits from a more female peer group (Lavy and Schlosser, 2007) and is negatively affected by mobile pupils (Gibbons and Telhaj, 2011) and pu-

pils with behavioural disorders (Fletcher, 2010). Evidence on the effect of the ability mix of peer groups points towards all pupils benefitting from a more able and motivated peer group (Proud 2010; Hanushek et al, 2003), a finding reflected in international comparisons that tend to find that selective and/or segregated school systems tend to reduce overall attainment (OECD, 2005; OECD, 2010), possibly by restricting mixing between high ability and motivated peers and other pupils.

## **2.3 Families and individual level influences**

The influence of parents and the family context on pupil performance begins within a few weeks of conception.

Maternal stress whilst in utero is thought to affect pupil performance both through the direct effect of psychological stress on the foetus (Aizer et al, 2012) and through stress-related behaviour such as smoking (Agrawal et al, 2010). Inequality in educational outcomes is partially embedded in an individual at birth.

In early childhood, cognitive development is encouraged by a caring home environment (Goodman et al, 2010) and stunted through neglect and family stress (Allen, 2011) – a factor which is known to be related to low family income (Evans and Garthwaite, 2010). It is during this period that educational inequalities develop rapidly (Goodman et al, 2010); by age five, children from households with no working parents are between four and 10 months behind their richer peers in terms of cognitive development indicators (Jones and Schoon, 2008). A significant proportion of educational inequality has therefore developed prior to entry into compulsory schooling.

Throughout childhood and schooling, parents make choices about the level of investments in their child's learning and construct the so-called 'home learning environment' that provides resources and sets expectations. Evidence suggests that investments such as help with reading (Goodall and Vorhaus, 2011), help with homework (Hoover-Dempsey et al, 2001), private tutoring (Ireson, 2004), extracurricular activities (Kaushal et al, 2011), books in the home (Evans et al, 2010) and computers at home (Beltran et al, 2008) make a difference to how a child performs at school. In addition, shocks to family income, such as unemployment (Gregg et al, 2012), have also been found to alter the trajectory of a child's learning. Finally, expectations set by parents are also likely to influence individual attainment (Davis-Kean, 2005). When these factors are taken together, the home learning environment exerts a powerful influence on pupil attainment, both contemporaneously and over the long term (Goodman et al, 2010).

At the individual level, innate cognitive ability is strongly linked to pupil performance (Deary et al, 2007). Other pupil-level factors have been found to affect performance, including pupil effort (Metcalf et al, 2011) and self-control (Goodman et al, 2010), though pupil-level influences are often difficult to separate out from the influences of families and peers.

In summary, we know that pupils begin compulsory schooling at a level that is determined in part by their family background and upbringing; we also know that pupil progress over the course of compulsory schooling is slower for pupils from poorer backgrounds (Clifton and Cook, 2012). The overall effect, therefore, is that educational inequalities are present on entry into school and increase throughout schooling (Francis and Wong, 2013).

### **3 What can be done to weaken the link between pupil characteristics and attainment?**

#### **3.1 Whole school improvement is part of the policy mix, but on its own is not enough**

The school accountability regime of league tables and school inspections has been demonstrated to raise standards and may reduce educational inequality (Allen et al, 2010; Burgess et al, 2010) and policies to encourage collaborative working between schools have shown positive results (Hutchings et al, 2010).

However, given the variety of factors identified above that affect pupil performance, the focus *solely* on school improvement will do little to weaken the link between pupil background and attainment. This is for two reasons:

First, as already explained, the school attended appears to count for little in terms of differences in educational outcomes. Clifton and Cook (2012) used the National Pupil Database to estimate that even if all pupils claiming free school meals were attending schools rated as 'outstanding' by Ofsted, the attainment gap between FSM and non-FSM pupils would only be reduced by a fifth and considerable educational inequalities would remain.

Second, though pupils perform better in schools rated good or outstanding, such schools are no more successful at reducing educational inequality between different types of pupil (Ofsted 2013).

#### **3.2 Sutton Trust/EEF interventions**

There is a growing consensus in educational policy that interventions to reduce the effect of pupil background on attainment will need to focus more

on what happens within schools and be targeted at individual pupils rather than focusing mainly on school improvement approaches. This is in part the rationale behind the government's 'pupil premium' policy that provides funding to schools mainly based on the number of pupils who claim free school meals, with the explicit direction that such funding is used to raise the attainment of these pupils.

The Sutton Trust and the Education Endowment Foundation (EEF, 2013) have published a guide to the cost-effectiveness of different interventions that schools and/or local authorities might undertake; a selection of the most effective interventions is outlined below. These are interventions identified by the Sutton Trust/EEF that have been found in previous research to produce the equivalent of at least three additional months of learning:

- *Developing teachers' skills*, e.g. skills related to providing effective, individualised feedback to pupils and teaching pupils strategies of meta-cognition and self-regulation (i.e. 'learning to learn').
- *Parental engagement strategies*, e.g. helping parents with their own learning needs and involving them in their child's learning.
- *One to one and small group tuition*, with academic tutoring rather than mentoring deemed to be more effective.
- *Peer tutoring*, i.e. organising a system whereby pupils tutor other pupils within the same school.
- *Providing individual feedback for pupils*.
- *Early interventions prior to schooling*, e.g. parenting classes, school readiness tutoring, etc.

The toolkit also argues that some methods, despite being widely used, may not be effective in increasing attainment. These include ability grouping, school uniforms and performance-related pay. It should be borne in mind that effective interventions in education is a dynamic and active area of research and much of the evidence for the above interventions may be limited to certain contexts. Moreover effective teaching and learning is a complex activity that cannot be reduced readily to simple interventions.

### **3.3 Wider interventions**

Notwithstanding the potential for the above to affect equity in educational outcomes, it is clear that the major educational interventions identified in section 3.2. ignore many of the identified drivers of pupil performance, and that there is a risk, as with the emphasis on school improvement, of a piecemeal 'panacea' approach.

Further strategies to reduce educational inequalities include:



- *Promoting healthy living within schools and at home*: Some studies have found that providing nutritious school dinners can produce large gains in both attainment and attendance (Brown et al, 2012; Belot and James, 2009) and the effects are greatest for those pupils from disadvantaged backgrounds.
- *Reducing segregation in schools*: Exploiting the peer effects through efforts to increase the social mix of schools is a relatively inexpensive but mostly ignored area of potential policy innovation. The OECD suggests that increasing the mix of pupils within our schools would increase attainment for disadvantaged pupils without reducing performance overall (OECD, 2012). Improved social mix also increases the ease at which peer tutoring can be implemented in schools.
- *Supporting families' incomes*: Policy on the home learning environment is perhaps an area where the difference between importance and policy focus is most stark (Francis and Wong, 2013). Allied to this, the pervasive effect of family-level economic wellbeing is perhaps too easily ignored when considering policies to reduce educational inequality since evidence suggests that raising the income of the poorest households has the effect of raising the educational attainment of children within them (Dahl and Lochner, 2012).

Above all, any action to reduce educational inequality is most effective if sustained over a pupil's school career. Socio-economic disadvantage affects not only educational attainment at particular points but also the educational progress of pupils (Clifton and Cook, 2012). Furthermore, the phenomenon of 'fade-out' of initial positive effects is commonly observed in educational interventions (Cascio and Staiger, 2012).

## 4 Conclusion

There is little difference *between* schools in the extent to which schools 'make a difference'. At the secondary level, attainment at the end of primary school is the most dominant factor in explaining pupil performance at GCSE.

At the primary level, pupil-level factors (e.g. family income, parental education) that were present before entry into schooling explain the majority of variation in pupil performance. This is not to say that schools do not make a difference in absolute terms, more that, using the very detailed datasets available on pupil performance, most research points towards there being little variation in the *relative* effectiveness of schools once pupil background characteristics are controlled for.

This suggests that efforts to improve school effectiveness, on their own, are unlikely to break the link between pupil background and attainment. Such an approach fails to recognise that educational inequality is present from a very young age, develops over schooling and is largely generated by much more powerful factors than school quality.

Policymakers who aim to reduce educational inequalities may wish to take a view of pupil performance that extends from birth up until the point at which a pupil leaves school and that considers the multi-level influences on pupil performance. The research base suggests three areas for consideration:

- Equality in attainment on entry to school; the later that educational inequality is left, the more difficult it becomes to reduce.
- A focus on *all* the drivers of pupil performance and the recognition that efforts need to be sustained over the period of schooling rather than as a reactive measure towards the end of compulsory schooling.
- Finally, family socio-economics, which substantial evidence shows has an influence on pupil performance and, as such, may be a factor to consider when developing other areas of social policy, such as the labour market, housing and the welfare system.

Efforts to reduce educational inequality are central to the policy programmes of all the main political parties. How exactly to achieve such an aim continues to be an active policy and academic debate.

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