

# Evaluation of Aimhigher:Excellence Challenge Pupil Outcomes One Year on

**Marian Morris, Simon Rutt and Tilaye Yeshanew**  
National Foundation for Educational Research

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*Evaluation of Aimhigher: Excellence Challenge*

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*National Foundation for Educational Research*

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# EXECUTIVE SUMMARY

Launched by the DfES in 2001 under the name of Excellence Challenge, Aimhigher: Excellence Challenge was initiated for young people, aged 13 to 19, who were in schools and colleges in deprived (primarily urban) areas. The main aim of the policy was to increase the number of young people from disadvantaged backgrounds who had the qualifications and aspirations to enter higher education. Since its inception, the initiative has been both extended and expanded and, in August 2004, Excellence Challenge was integrated with Partnerships for Progression into one coherent outreach programme: Aimhigher.

This report is one of a series looking at the educational and economic impact of Aimhigher: Excellence Challenge. It draws on qualitative and quantitative data obtained as part of a large-scale longitudinal evaluation, conducted on behalf of the DfES by a consortium led by the NFER and comprising researchers at both LSE and IFS. The data has been collected since the start of the 2001/02 academic year from young people (in compulsory education, in further education, training or work and in higher education), from schools, colleges and higher education institutions and from Excellence Challenge: Aimhigher partnerships. This report focuses particularly on the analysis of the data that was collected, over two academic years (2001/02 and 2002/03), from **19,998** young people in Year 11 and **17,116** in Year 9 (See Chapter 1.2)

## Key Findings

In summary, once all background characteristics at school and pupil level had been controlled for through multilevel modelling and logistic analyses, statistically significant associations were identified between a number of **policy interventions** and **pupil attainment**. Higher than expected levels of attainment were associated with the following interventions:

- ◆ **At Key Stages 3 and 4:**
  - Designation as a member of the widening participation cohort
  - Designation as a member of the gifted and talented cohort
  - Participation in summer schools
  - Discussions with university lecturers or undergraduates about university.
- ◆ **At Key Stage 4 alone:**
  - Visits to university
  - Discussions with family or friends about university.

As suggested by partnership coordinators and by teaching and higher education staff, these interventions appeared to be more effective when they were repeated and when they took place as part of an ongoing programme of activities under Aimhigher: Excellence Challenge.

Statistically significant associations were also identified between policy interventions and **pupil aspirations to higher education**, particularly in terms of young people's discussions with their family or with undergraduates about university. A school ethos in which young people were encouraged to think about going to university was also associated with a stated intention by young people to go to university. However, only one of these factors, **young people's discussions with their family**, was associated with young people changing their mind between Year 10 and Year 11 about going on to a higher education course.

### **Aims of the Study**

The analysis conducted for this report aimed to address some key research questions, drawing on data from young people in Years 9 and 11 in 2001/02 and 2002/03 (see Chapter 1.3). These questions included:

- ♦ What is the general pattern of attainment amongst different groups of pupils? Are these differences still evident once young people's other background characteristics are taken into consideration?
- ♦ Are there any differences in young people's attitudes to education and aspirations between different groups of pupils?
- ♦ To what extent are there any variations in performance between young people, with the same background characteristics, in Aimhigher: Excellence Challenge schools and those in comparison schools?
- ♦ What is the relationship (if any) between Aimhigher: Excellence Challenge interventions and attainment and/or attitudes and aspirations, once individual pupil and school characteristics and pupil prior attainment are taken into account?
- ♦ Is it possible to identify the particular impact of any specific Aimhigher: Excellence Challenge interventions on attainment and/or attitudes and aspirations.

### **Methods**

An exploration of the relative impact of Aimhigher requires a systematic approach to the analysis of statistical data. Following data matching of the surveys, and of the policy-related background information provided by schools, to the national Pupil Database (NPD), a series of different statistical tests, including analyses of variance, multiple regression analyses and t-tests, were used to identify measures to be incorporated into a series of multilevel and logistic regression models. These cross-sectional models (comparing the 2001/02 Year 9 cohort with the 2002/03 Year 9 cohort and the 2001/02 Year

11 cohort with the 2002/03 Year 11 cohort) and longitudinal models (following the 2001/02 Year 10 cohort into Year 11) were constructed to look at a range of different ‘hard’ (attainment) and ‘soft’ (attitudes and aspirations) outcome measures in order to explore the impact of Aimhigher and the various activities that have been implemented under the initiative (see Chapter 2 and Appendix 3).

### **Profile of the Cohorts** (See Chapter 3)

The profile of the Aimhigher: Excellence Challenge cohorts included in the study are not identical to those of all young people nationally. The young people were from schools predominantly located in metropolitan areas and, compared with all schools nationally, had higher proportions of pupils who were entitled to free school meals; who spoke English as an additional language and had lower mean levels of aggregated attainment: few of the young people responding to the surveys came from high performing schools.

The responding cohorts in 2001/02 and 2002/03 were largely similar in relation to their background circumstances, particularly in terms of young people’s socio-economic circumstances, the percentage with special educational needs and the proportion of young people who had been excluded for a fixed term during the previous academic year.

As part of the Aimhigher: Excellence Challenge policy, two specific cohorts of young people were identified by partnerships (Chapter 3.2):

- ♦ The first of these included young people designated as part of the **widening participation** cohort; that is, those who were in learning (whether pre- or post-16) who had the ability to progress to higher education, but who came from predominantly disadvantaged backgrounds without any history of higher education. Just below eight per cent of the young people in the Year 11 cohorts in the study (and five per cent of the Year 9 cohorts) were identified as part of the widening participation group in their school.
- ♦ The second cohort included those who were identified as **gifted and talented**. Under Aimhigher: Excellence Challenge this group was confined (for funding purposes) to those who were in post-16 education. Pre-16, the gifted and talented cohort was funded under the EiC initiative in Phase 1 and 2 areas and in Phase 3 areas. Under EiC, participating schools were required to identify a gifted and talented cohort of some five to ten per cent of each year group in Key Stages 3 and 4. At least two thirds of this cohort are expected to be those with the highest levels of attainment in academic areas of the curriculum. No specific policy-related funding was available for this group in EAZ areas, although some identified such young people among their pre-16 cohorts. Amongst the young people in the study, 10% of the Year 11 cohort and 9.1% of Year 9 cohort were designated as gifted and talented.



It was possible for young people to be identified in both groups (both pre- and post-16); 21% of the Year 11 widening participation cohort and 18% of the Year 9 widening participation cohort were also identified as gifted and talented.

There were some clear differences in terms of representation by sex (higher proportions of females than males were designated as gifted and talented) and ethnicity; some groups, particularly Indian and Bangladeshi pupils, appeared to be less well represented in both the gifted and talented and widening participation cohorts than would have been expected, given the proportion of such pupils in the age cohort.

### **The findings: Year 11 attainment** (See Chapter 4.2)

In summary, once all background characteristics at school and pupil level had been included in the analysis, the cross-sectional analysis identified the following associations between the following policy interventions and higher attainment at Key Stage 4:

- ◆ Designation as a member of the **widening participation cohort** was associated with higher levels of attainment in terms of:
  - total score at GCSE (an additional 1.16 GCSE points, or just over one grade at GCSE. The impact appears to have been greater for those who had been so designated in both Year 10 and Year 11, with an associated attainment of an additional 1.68 GCSE points);
  - capped eight GCSE score (an additional 0.64 GCSE points or just under one grade at GCSE);
  - average GCSE score (an additional 0.06 points per GCSE)
  - an increased likelihood of achieving five or more A\* to C grades at GCSE – young people in the widening participation cohort were one and a half times more likely to have achieved such grades than young people with the same background characteristics who were not so designated.
- ◆ Designation as a member of the **gifted and talented cohort** was associated with higher levels of attainment in terms of:
  - total score at GCSE (an additional 4.42 GCSE points);
  - capped eight GCSE score (an additional 3.13 GCSE points);
  - average GCSE score (an additional 0.4 points per GCSE);
  - an increased likelihood of achieving five or more A\* to C grades at GCSE – young people in the gifted and talented cohort were two and three quarter times more likely to have achieved such grades than young people with the same background characteristics who were not so designated. Young people who had been part of the cohort for two years were more than four times more likely to have achieved these higher grades than their academic and social peers.

Young people who had seen a Learning Mentor in low performing schools were one and a quarter times more likely than young people with the same background characteristics in low performing schools who had not been mentored to have attained five or more A\* to C grades at GCSE. Their overall level of attainment was also marginally greater than young people who had not seen a Learning Mentor or who had been mentored in other types of school.

The longitudinal analysis indicated that four specific interventions were associated with young people who achieved higher levels of attainment at Key Stage 4 than would have been anticipated from their prior attainment alone. These interventions, two of which were activity based and two of which were more informal and individually-focused, included:

- ◆ Attendance at **summer schools** (or equivalent) both in (or prior to) Year 10 and in (or prior to) Year 11. Young people who indicated that they took part in such schools in both years were associated with higher levels of attainment in terms of:
  - total score at GCSE (an additional 1.12 GCSE points, or just over one grade at GCSE). Young people who took part in a summer school prior to Year 10 alone were associated with an additional 0.77 GCSE points.
  - capped eight GCSE score (an additional 0.64 GCSE points or just under one grade at GCSE);
  - average GCSE score (an additional 0.09 points per GCSE)
  - an increased likelihood of achieving five or more A\* to C grades at GCSE (an odds multiplier of 1.32).
- ◆ **Visits to university** during Year 10 and/or Year 11. Young people who said that they took part in such visits in both years were associated with higher levels of attainment in terms of:
  - total score at GCSE (an additional 1.1 GCSE points, or just over one grade at GCSE);
  - capped eight GCSE score (an additional 0.86 GCSE points, or just under one grade at GCSE);
  - average GCSE score (an additional 0.11 points per GCSE)
- ◆ **Discussions with family or friends about university.** Over 70% of the young people included in the longitudinal analysis reported such discussions in Year 11, with nearly two thirds of these having spoken to both family and friends. Young people who noted such discussions were associated with higher levels of attainment in terms of:
  - total score at GCSE (an additional 1.6 GCSE points, or just over one grade at GCSE). For girls, such discussion was associated with a lower additional score – an additional 0.78 GCSE points compared with girls with the same background characteristics and prior attainment who had not taken part in such discussions.

- capped eight GCSE score (an additional 1.03 GCSE points or just over one grade at GCSE). For girls, such discussion was associated with a lower additional score – an additional 0.45 GCSE points compared with girls with the same background characteristics and prior attainment who had not taken part in such discussions.
- average GCSE score (an additional 0.12 points per GCSE ). For girls, such discussion was associated with a lower additional score – an additional 0.06 GCSE points per GCSE compared with girls with the same background characteristics and prior attainment who had not taken part in such discussions.
- an increased likelihood of achieving five or more A\* to C grades at GCSE (an odds multiplier of 1.24).
- ◆ **Discussions with university staff or undergraduates about university.** Just over two thirds of the young people in the longitudinal survey (36%) reported such discussions in Year 11, with one third of these reporting talking to both university staff and undergraduates.
  - **Boys and girls** who reported such discussions were associated with higher levels of attainment in terms of:
    - an increased likelihood of achieving five or more A\* to C grades at GCSE (an odds multiplier of 1.19).
  - **Girls** who reported such discussions were associated with higher levels of attainment in terms of:
    - total score at GCSE (an additional 0.64 GCSE points compared with girls with the same background characteristics and prior attainment who had not taken part in such discussions).
    - capped eight GCSE score (an additional 0.51 GCSE points compared with girls with the same background characteristics and prior attainment who had not taken part in such discussions).
    - average GCSE score (an additional 0.06 points per GCSE compared with girls with the same background characteristics and prior attainment who had not taken part in such discussions).

The apparent impact of these interventions on pupil attainment should be viewed with caution at this stage. It may be that the activities prompted higher levels of motivation at Key Stage 4, leading to higher levels of attainment. Equally, the young people who took part in the activities may have already been highly motivated, and this may have been why they took part in the activities. Nonetheless, it is encouraging that the activities that are widely cited by partnership coordinators, teachers and university staff as key factors in motivating young people (see for example, Morris *et al.* 2005, Judkins *et al.* 2005 and West *et al.* 2005) also appear to be associated with higher levels of achievement. At school level, however, the data also indicated that the creation of a stable environment in which teachers had a positive view of pupils and their capabilities, and in which parental support was fostered, was a key factor in promoting higher levels of attainment amongst pupils.

### The findings: Year 9 attainment (See Chapter 4.3)

In summary, once all background characteristics at school and pupil level had been included in the analysis, positive associations were identified between the following policy interventions and attainment at Key Stage 3:

- ◆ Designation as a member of the **widening participation cohort** was associated with higher levels of attainment in terms of:
  - higher average levels at Key Stage 3 overall (an additional 0.18 of a level, equivalent to approximately 6.48 months of progress);<sup>1</sup>
  - higher average levels in Key Stage 3 English (an additional 0.17 of a level, equivalent to approximately 6.12 months of progress);
  - higher average levels at Key Stage 3 maths (an additional 0.2 of a level, equivalent to approximately 7.2 months of progress).
- ◆ Designation as a member of the **gifted and talented cohort** was associated with higher levels of attainment in terms of:
  - higher average levels at Key Stage 3 overall (an additional 0.37 of a level, equivalent to approximately 13.32 months of progress – for African pupils the increase was lower at 0.04 of a level);
  - higher average levels in Key Stage 3 English (an additional 0.3 of a level, equivalent to approximately 10.8 months of progress – for young people in low performing schools, the increase was lower at 0.23 of a level);
  - higher average levels at Key Stage 3 maths (an additional 0.43 of a level, equivalent to approximately 15.48 months of progress).
- ◆ Participation in a **summer school**<sup>2</sup> was associated with higher levels of attainment in terms of:
  - higher average levels at Key Stage 3 overall (an additional 0.07 of a level, equivalent to approximately 2.52 months of progress);
  - higher average levels in Key Stage 3 English (an additional 0.06 of a level, equivalent to approximately 2.16 months of progress);
  - higher average levels at Key Stage 3 maths (an additional 0.08 of a level, equivalent to approximately 2.88 months of progress).
- ◆ Discussions with **university staff or undergraduates about university** were associated with higher levels of attainment in terms of:
  - higher average levels at Key Stage 3 overall (an additional 0.03 of a level, equivalent to approximately 1.08 months of progress);

<sup>1</sup> The various equivalents for months of progress are based on an expected progression of at least one level from Key Stage 2 to Key Stage 3 over a period of 36 months from Year 6 to Year 9. The DfES state that the target for 14 year olds at Key Stage 3 is Level 5 or Level 6.

<sup>2</sup> Note that the term summer school may refer to other holiday activities, organised by schools, higher education providers or other organisations and may not refer specifically to Aimhigher: Excellence Challenge activities. Young people in Year 9 were not always aware whether or not the summer school or holiday activity they had attended was part of Aimhigher: Excellence Challenge.

- higher average levels in Key Stage 3 English (an additional 0.02 of a level, equivalent to approximately 0.72 months of progress);
- higher average levels at Key Stage 3 maths (an additional 0.04 of a level, equivalent to approximately 1.44 months of progress).

**The findings: Year 11 attitudes and aspirations** (See Chapter 5.1 and 5.2)

There was little statistical evidence from the cross-sectional analysis to suggest that Aimhigher: Excellence Challenge activities had yet played a major part in influencing young people's attitudes to pre- or post-16 education or to their (self-reported) behaviour in school. Such positive attitudes were more likely to be associated with members of the gifted and talented cohort than with other young people (an odds multiplier of 1.31) but there was no such association with being designated as a member of the widening participation cohort. There was evidence to suggest that the ethos created by teachers in a school could have a significant impact on young people's attitudes. Appropriate curriculum provision and parental support were also key.

However, there were clear indications that some of the strategies that have been implemented or enhanced under Aimhigher: Excellence Challenge were significantly associated with an intention to go to university. These included:

- ◆ Young people's schools making them think of the value of going to university
- ◆ Opportunities to discuss life at university with family or friends
- ◆ Opportunities to discuss life at university with undergraduates.

The longitudinal modelling process revealed that, for the 1,862 young people who had changed their mind about going to university between Year 10 and Year 11 (and once prior attainment had been taken into account) the key factors associated with a changed and positive decision to enter higher education were:

- ◆ home background (young people living with both parents were more likely than other young people to have become more motivated towards undertaking a university course since Year 10)
- ◆ sex (girls were more likely than they had been in Year 10 to be considering a degree or equivalent course)
- ◆ speaking to family members about life at university.

At this stage, therefore, it does not appear that the interventions that have been implemented so far under Aimhigher: Excellence Challenge for this group of young people have significantly influenced the decision-making process for

young people in Year 10 and Year 11 in the longitudinal study. However, while no clear links were evident between policy-related interventions and changed decisions, the analysis has re-emphasised the importance of parental involvement in decision-making and has indicated that there is potential for leverage, even amongst young people in low performing schools.

### **The findings: Year 9 attitudes and aspirations**

For pupils in Year 9, family background and family attitudes to education appeared paramount in young people's aspirations to follow a higher education course. However, there was evidence to suggest that the creation of an ethos in schools in which young people were encouraged to think about going to higher education and the opportunity for discussions with family and friends and with university staff and undergraduates about higher education were also significant.

### **Conclusion** (See Chapter 6)

Within one year of the implementation of Aimhigher: Excellence Challenge, it would appear that there are some significant statistical associations between policy-related interventions and young people's attainment and aspirations. These associations are by no means straightforward; while links can be seen between an aspiration towards higher education and Aimhigher: Excellence Challenge activities, the role played by such activities in actively changing young people's ambitions is less clear, for example.

The findings to date, however, suggest that the most effective strategies in promoting higher attainment and increasing motivation are those that are part of an on-going programme of events, expose young people to the realities of all aspects of university life, whether through visits or through discussions with current students. They also highlight the value of a supportive and encouraging ethos within schools in which an aspiration to higher education is seen as a possibility for a wide range of young people with ability and with a willingness to work.

The greatest challenge for the unified Aimhigher programme in the future may be to reach out to parents and to involve them in activities that help them to understand, consider and promote higher education for their children.



# 1. INTRODUCTION

Between the 1960s and the present day there has been a marked increase in the numbers of young people entering higher education, with total numbers in the UK increasing from around 300,000 in the 1960s to nearly 1,800,000 by 2002/03.<sup>3</sup> The Age Participation Index (API) for young people aged under 21 in Great Britain also rose from 19% in 1990/1 to 35% in 2001/02.<sup>4</sup> Other significant changes have been noted, with a sharp increase in the numbers of part-time students (most of whom are mature students) and the numbers of female students. There has been an increase in overall participation amongst minority ethnic groups and, indeed, there is evidence that, proportionally, there is a higher rate of participation amongst young people from minority ethnic backgrounds than amongst young people from white UK backgrounds.<sup>5</sup>

Despite these positive developments, there are still many groups in society that remain under-represented in higher education, including females from Bangladeshi backgrounds, young people with disabilities,<sup>6</sup> those who are looked after by local authorities and those who enter higher education via a vocational route. The strong negative links with high levels of socio-economic disadvantage that were identified in both England and Scotland during the 1990s<sup>7</sup> remain evident. In a recent paper, Gilchrist *et al.* (2004) indicated that while nearly 90% of young people from social classes I and II who have appropriate entry qualifications at age 21 achieve higher education qualifications by the age of 30, the proportion of qualified young people from social classes III (non-manual) to V achieving such higher education

<sup>3</sup> DEPARTMENT FOR EDUCATION AND SKILLS (2004). *4.7: Post 16 Learning: Higher Education Student Population* [online]. Available: [http://www.dfes.gov.uk/trends/upload/xls/4\\_7t.xls](http://www.dfes.gov.uk/trends/upload/xls/4_7t.xls) [14 October, 2004].

<sup>4</sup> DEPARTMENT FOR EDUCATION AND SKILLS (2004). *Welcome to Trends in Education and Skills* [online]. Available: <http://www.dfes.gov.uk/trends> [14 October, 2004]. The Higher Education Initial Participation Rate (HEIPR), which replaces the previous Initial Entry Rate (IER), for 2002/03 was 44% in 2002/03. This indicates the proportion of 17-30 year old England domiciled first-time entrants to Higher Education and is the way in which DfES measures progress toward its stated aim of 50% of young people having the opportunity to benefit from Higher Education by 2010.

<sup>5</sup> CONNOR, H., TYERS, C., MODOOD, T. and HILLAGE, J. (2004). *Why the Difference: a Closer Look at Higher Education Minority Ethnic Students and Graduates* (DfES Research Report 552). London: DfES.

<sup>6</sup> NATIONAL DISABILITY TEAM (2004). *Aspiration Raising and Transition of Disabled Students From Further Education To Higher Education* [online]. Available: <http://www.natdisteam.ac.uk/FinalReportSS.doc> [30 October 2004]

<sup>7</sup> See, for example, JOHNSTON, V., ROBB, G. and ABDALLA, I. (1999). 'Participation in higher education in Scotland: a geographic and social analysis', *Higher Education Quarterly*, **53**, 4, 369–94 and HIGHER EDUCATION FUNDING COUNCIL FOR ENGLAND (1997). *The Influence of Neighbourhood Type on Participation in Higher Education*. Bristol: HEFCE.



qualifications by the same age is significantly lower.<sup>8</sup> The figures for young people from such backgrounds ranged from 36% for social class III (non-manual) down to 18% for social classes III (manual) and V (unskilled).

The challenge to widen participation in higher education continues, therefore, but is not unique to the UK – indeed it has been recognised as a significant element in the promotion of lifelong learning across Europe. Of the four main strategies identified in member states in 2000,<sup>9</sup> two have been key to the government policies for increasing participation in higher education amongst young people in England.<sup>10</sup> Specifically, these have been **increasing provision**, with additional places made available in further and higher education, and **extending access** to sectors of society that have previously been unrepresented. This latter is the major premise behind **Aimhigher: Excellence Challenge**, which seeks to improve access to higher education for young students from deprived areas and to reduce some of the gaps that currently exist in terms of the representation of different socio-economic groups.

## 1.1 Aimhigher: Excellence Challenge – The Initiative

Launched by the DfES in 2001 under the name of Excellence Challenge, Aimhigher: Excellence Challenge was initiated for young people, aged 13 to 19, who were in schools and colleges in deprived (primarily urban) areas. These areas were those involved in Phase 1 and 2 of the Excellence in Cities<sup>11</sup> (EiC) programme and those in non-EiC Education Action Zones (EAZs).<sup>12</sup> The main aim of the policy was to increase the number of young people from disadvantaged backgrounds who have the qualifications and aspirations to enter higher education. Previous research had suggested that a lack of information about higher education opportunities (which was thought to be more evident amongst families that had no history of higher level study), as

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<sup>8</sup> GILCHRIST, R., PHILLIPS, D. and ROSS, A. (2002). 'Participation and potential participation in UK higher education.' In: ARCHER, L., HUTCHINGS, M. and ROSS, A. (2002) *Higher Education and Social Class*. London: RoutledgeFalmer.

<sup>9</sup> EURYDICE EUROPEAN UNIT (2000). *Lifelong Learning: the Contribution of Education Systems in the Member States of the European Union*. Brussels: Eurydice European Unit.

<sup>10</sup> The third strategy, the diversification of provision, could, arguably, be said to have been a significant factor behind the creation of the Open University during the 1970s. Strategies to reduce failure and dropout (the fourth element) have, to date, been focused primarily on those in compulsory education and post-16 further education and training.

<sup>11</sup> Launched in September 1999, Excellence in Cities is one of the Government's key policy initiatives for redressing educational disadvantage and under-performance in schools located within the most deprived urban areas of England. It has adopted a multi-strand approach to raising standards and performance and emphasises the use of locally-based partnership approaches and targeted provision. While some of the policy strands (such as Excellence Action Zones, City Learning Centres, Beacon Schools and Specialist Schools) operate at either area or whole school level, others (the Gifted and Talented Strand, Learning Support Units, and Learning Mentors) are specifically targeted at the individual student.

<sup>12</sup> Education Action Zones are in the process of being transformed to Excellence Clusters.

well as social and financial concerns, played a part in reduced levels of applications from young people from lower social class groups.<sup>13</sup> Aimhigher sought to address some of these issues through, for instance, the provision of pertinent information, targeted student-centred and school or college-centred activities and an element of financial support. These, it was hoped, would improve motivation, raise aspirations and assist transition to further and higher education. A key component in this work was the improvement of links between universities, colleges and schools, facilitated by the enhancement or development of local partnerships or communication infrastructures.

Since its inception, the initiative has been both extended and expanded. Following the publication of the Government's White Paper, *'The Future of Higher Education'* (DfES, 2003),<sup>14</sup> funding was guaranteed up to 2006 and new areas (Phase 3 EiC areas and some Excellence Clusters that were still outwith the policy) were incorporated. This expansion was accompanied by re-branding, with all new areas using the label Aimhigher<sup>15</sup> from September 2003 and existing areas replacing the Excellence Challenge logo with the Aimhigher logo by September 2004. Furthermore, the Aimhigher logo was used to brand all Partnership for Progression activities,<sup>16</sup> under the auspices of the Higher Education Funding Council for England (HEFCE)<sup>17</sup> and the Learning and Skills Council (LSC). This branding presaged the integration of the two initiatives, previously Excellence Challenge and Partnerships for Progression, into one coherent outreach programme (Aimhigher) from August 2004.<sup>18</sup>

## 1.2 The Study

But what is the evidence that Aimhigher: Excellence Challenge is meeting its aims? This report is one of a series drawing on qualitative and quantitative data obtained since the start of the 2001/02 academic year from young people (in compulsory education, in further education, training or work and in higher

<sup>13</sup> See, for example CONNOR, H. and DEWSON, S. with TYERS, C., ECCLES, J., REGAN, J. and ASTON, J. (2001). *Social Class and Higher Education: Issues Affecting Decisions on Participation by Lower Social Class Groups* (DfEE Research Report 267). Sheffield: DfEE.

<sup>14</sup> GREAT BRITAIN. PARLIAMENT. HOUSE OF COMMONS (2003). *The Future of Higher Education* (Cm. 5735). London: The Stationery Office. As a result of this expansion, 86 new local partnerships would be involved in implementing the Excellence Challenge (now Aimhigher) initiative.

<sup>15</sup> Aimhigher was the brand name initially adopted by the marketing strand of the Excellence Challenge policy.

<sup>16</sup> Partnerships for Progression was a jointly funded initiative run, on a regional basis, by the HEFCE and the LSC to increase and widen participation in higher education.

<sup>17</sup> In 2003, HEFCE announced changes to the way in which it funded universities for widening participation activities, replacing the postcode premium with the widening participation allocation (see XAVIER, R. and WEST, A. (2003). *Excellence Challenge Funding and Widening Participation*. Unpublished report).

<sup>18</sup> This integration was originally planned for April 2004.

education), from schools, colleges and higher education institutions and from Excellence Challenge: Aimhigher partnerships. It focuses specifically on the analysis of data that was collected, over two academic years (2001/02 and 2002/03), from **19,998** young people in Year 11 and **17,116** in Year 9.<sup>19</sup> This includes data from 14,947 young people in Year 11 in ‘treatment’ schools that were involved in Aimhigher: Excellence Challenge (those in EiC Phase 1 and 2 areas and EAZS) and 5051 who were enrolled in comparison schools (that is those in EiC Phase 3 and comparable non-EiC areas). It also includes data from 13,780 Year 9 pupils in treatment schools and 3,336 Year 9 pupils from comparison schools. A breakdown of the number of responses, by year and from treatment and comparison schools, is provided in **Appendix 1**.

This data was collected as part of a large-scale longitudinal evaluation, conducted on behalf of the DfES by a consortium led by the NFER and comprising researchers at both LSE and IFS. The evaluation has adopted an integrated, mixed methodology strategy, incorporating wide-ranging **surveys** (of young people in compulsory education, post-16 destinations and post-18 destinations, including higher education), **interview programmes** (in Aimhigher: Excellence Challenge partnerships, schools, colleges and higher education institutions) and detailed **area case studies** (in ten selected partnerships).<sup>20</sup> The analysis that has been undertaken includes techniques to ascertain aspects both of the educational impact and the economic effectiveness of the Aimhigher: Excellence Challenge policy. This report focuses on the educational impact of the programme.

### 1.3 The Report

Individual pupil-level data was used to provide both descriptive statistics and to facilitate more complex multilevel analyses, in order to address some key research questions. These included:

- ♦ What is the general pattern of attainment amongst different groups of pupils? Are these differences still evident once young people’s background characteristics are taken into consideration?
- ♦ Are there any differences in young people’s attitudes to education and aspirations between different groups of pupils?
- ♦ To what extent are there any variations in performance between young people, with the same background characteristics, in Aimhigher: Excellence Challenge schools and those in comparison schools?
- ♦ What is the relationship (if any) between Aimhigher: Excellence Challenge interventions and attainment and/or attitudes and aspirations,

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<sup>19</sup> Note that young people in Years 8 and 10 also completed questionnaires in 2001/02 and 2002/03. Data from these pupils will be included primarily in longitudinal analyses.

<sup>20</sup> Details of the evaluation strategy and research methodology are outlined in Appendix 1.

once individual pupil and school characteristics and pupil prior attainment are taken into account?

- ♦ Is it possible to identify the particular impact of any specific Aimhigher: Excellence Challenge interventions on attainment and/or attitudes and aspirations?

At the outset, it should be recognised that the profile of the Aimhigher: Excellence Challenge cohorts are not identical to those of all young people nationally. To begin with, the young people were from schools predominantly located in metropolitan areas: 84% of all Year 11 Aimhigher: Excellence Challenge pupils (and 66% of the respondents), for instance, were from such schools, compared with only 37% of all pupils nationally. The schools in which they were based represented those with high levels of socio-economic and educational disadvantage. In 2002/03, and compared with non-Aimhigher: Excellence Challenge schools, for example, they had:

- ♦ higher proportions of pupils who were entitled to **free school meals**: 50% of the Aimhigher: Excellence Challenge schools were in the top quintile of pupil eligibility, compared with 17% of all schools
- ♦ higher proportions of pupils who spoke **English as an additional language** (EAL): 12% of the Aimhigher: Excellence Challenge Year 11 cohorts, compared with four per cent nationally, were in schools where more than 50% of the population are identified as EAL speakers.
- ♦ generally lower mean levels of **aggregated attainment**: only 10% of the Aimhigher: Excellence Challenge schools were in the highest band of achievement at Key Stage 3, compared with 18% of schools nationally, while 43% of the Aimhigher: Excellence Challenge schools were in the lowest band, in contrast with only 20% of non-Aimhigher: Excellence Challenge schools. The picture is similar at Key Stage 4, with eight per cent of Aimhigher: Excellence Challenge schools in the highest band of achievement, compared with 15% of schools nationally, and 41% were in the lowest band, in comparison with 20% of non-Aimhigher: Excellence Challenge schools.

Tables 1 to 4 in **Appendix 2** provide a picture of the representativeness of the young people (in Years 9 and 11) who responded to the surveys in 2001/02 and 2002/03 compared with all pupils in these cohorts in England. From this data it is evident that young people responding to this survey are broadly representative of all young people in Aimhigher: Excellence Challenge schools, and, as outlined above, include a higher proportion of young people from disadvantaged and low performing schools than would be expected were one to look at all secondary schools nationally. However, it should be noted that the most disadvantaged and low performing schools in Aimhigher areas (particularly in the south) may not be fully represented. At the time when the surveys were conducted, some of these schools were already the subject of intense scrutiny, from Ofsted, from local authorities and from the evaluation

of other initiatives (such as the DfES commissioned study into schools in extremely challenging circumstances), and proved to be the hardest group to recruit to the evaluation.

The report begins with an overview, in **Chapter 2**, of the datasets included in the analysis, before providing a profile of the responding cohorts in **Chapter 3**. This profile outlines a range of background factors (such as sex, ethnic background, socio-economic and family variables) and attainment at Key Stages 3 and 4 (split by pupil background characteristics and school characteristics). **Chapter 4** explores the relationship between attainment and educational interventions, taking into account background variables at pupil and school level. It presents the findings from a series of multilevel cross-sectional and longitudinal models. For pupils in Year 9, these include models examining the relationship between policy-related interventions and attainment outcomes for average level at Key Stage 3 and for the levels achieved in the core subjects of English and mathematics.<sup>21</sup> For pupils in Year 11, these include multilevel models that examine the relationship between interventions and total GCSE score, average GCSE score, best (or capped) eight GCSE scores, and logistic multilevel models examining the probability of a young person achieving five or more GCSEs at A\* to C.

**Chapter 5** presents the findings from a series of multilevel cross-sectional and longitudinal models exploring the relationship between policy-related interventions and young people's attitudes to learning, young people's behaviour and young people's aspirations to higher education. **Chapter 6** summarises the statistically significant findings from the modelling process, explores the links between these and the results of both quantitative and qualitative analysis carried out elsewhere in the evaluation and looks at the implications of these findings for the wider Aimhigher policy.

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<sup>21</sup> There are no separate models for attainment in Science at Key Stage 3. This is because of the tiered nature of assessment tests in Science at the end of Year 9.

## 2. THE DATA SETS

As part of the national evaluation of Excellence Challenge/Aimhigher, the first pupil surveys took place in 2001/02 in ‘treatment’ schools in EiC Phase 1 and 2 areas and in non-EiC EAZs, and in ‘comparison’ schools in EiC Phase 3 areas and, for Cohort 3 only (see below), non-EiC comparison schools. Follow-up surveys of the same pupils, their teachers and their schools, took place in 2002/03. The data in this report draws on information from four of those cohorts: **Table 2.1** shows, in bold, the groups of young people who are the specific focus of the analysis featured in this report. These groups, for whom end of key stage attainment data is available, are the subject of **cross-sectional analysis** (Year 9 in 2001/02 is compared with Year 9 in 2002/03 while Year 11 in 2001/02 is compared with Year 11 in 2002/03) and **longitudinal analysis** (with changes between Year 10 and Year 11 being examined for Cohort 3).<sup>22</sup>

**Table 2.1**

	<b>2001/02</b>	<b>2002/03</b>
Cohort 1	Year 8	<b>Year 9</b>
Cohort 2	<b>Year 9</b>	Year 10
Cohort 3	Year 10	<b>Year 11</b>
Cohort 4	<b>Year 11</b>	Year 12

Data from the young people’s questionnaires was matched to PLASC (the Pupil Level Annual Schools Census) and the National Pupil Database NPD,<sup>23</sup> in order to obtain background characteristics (sex, ethnicity, special educational needs, in receipt of free school meals or level of fluency, for example) and levels of attainment (prior attainment and end of Key Stage data or GCSEs, as appropriate).<sup>24</sup> Individual pupil information obtained from the schools (such as a young person’s designation as gifted and talented or as a member of the widening participation cohort) was also matched to the survey

<sup>22</sup> It should be noted that Cohort 3 is larger than the other cohorts, as it includes pupils from the non-EiC non-EAZ comparison schools. Some 17,902 young people from Year 10 returned questionnaires in 2001/02 and, in 2002/03, these were matched with their survey responses in Year 11.

<sup>23</sup> This included prior attainment (at Key Stage 2 or 3, as appropriate) and, in the case of young people in Years 9 and 11, attainment at the end of the Key Stage.

<sup>24</sup> It should be noted that the attainment data for the Year 11 cohort does not include data from NISVQ, as no agreement had been reached about equivalency measures between GCSE and NVQ level 1 qualifications for the 2001/02 cohort.

data, as was questionnaire data from young people's teachers and their schools' senior management teams.

In order to be included in the multilevel modelling process, all relevant background data (at pupil and school level) needed to be available.<sup>25</sup> At each stage of the analysis, a decision was made as to whether young people for whom the relevant individual data item was missing (such as number of books in the home or prior attainment at Key Stage 3) should be assigned to the mean for that variable or omitted from the analysis.<sup>26</sup> This means that the number of young people for whom the various models were constructed is therefore lower than the number for whom the basic descriptive statistics were derived. However, as Tables 2.2 and 2.3 indicate, the numbers of pupils in each of the cross-sectional and longitudinal models is sufficiently large to enable the research team to have confidence in the reliability of the findings.

**Table 2.2** provides an overview of the numbers of young people included in each of the various cross-sectional attainment and attitude models. The models were constructed to measure the relationship between policy-related activities and outcomes at the end of Year 11 (GCSE attainment and aspirations to higher education) and Year 9 (Key Stage 3 attainment and attitudes to education).

**Table 2.2 Data included in multilevel modelling: Cross-sectional models**

Multilevel models	Year 9	Year 11
Key Stage 3 average level	15,591	-
Key Stage 3 average level (English)	15,252	-
Key Stage 3 average level (mathematics)	14,175	-
Attitudes to education	15,812	17,763
Total GCSE score	-	17,721
Capped 8 GCSEs	-	17,721
Average GCSE score	-	17,714
5 A*–C grades	-	18,138
Aspirations to higher education	15,812	18,138

**Table 2.3** provides an overview of the numbers of young people included in each of the various longitudinal attainment and attitude models. These were constructed using data from Cohort 3 – the 2001/02 Year 10 cohort (Year 11 in 2002/03). In order to maximise the number of pupils upon which the

<sup>25</sup> An explanation of the modelling process can be found in **Appendix 3**.

<sup>26</sup> The decision as to whether or not to omit young people from the analysis depended upon the nature of the variable that was missing. It is possible, for example, to assign a mean value to young people for whom data on the number of books in the home was missing. It is not possible to assign a mean value to prior attainment. Young people remained eligible for inclusion for any subsequent analyses that did not require a particular missing variable, however.

longitudinal analysis could draw, these models included pupil level and school level data (from the NFER's Register of Schools) and did not draw on the data from teacher or school questionnaires.

**Table 2.3 Data included in multilevel modelling: Longitudinal models**

Multilevel models	Year 10 to Year 11
Total GCSE score	9065
Capped 8 GCSEs	9065
Average GCSE score	9065
5 A*–C grades	9085
Changed aspirations to higher education*	1,862

*\*This analysis was conducted for a sub-set of the data; young people who had changed their mind between Year 10 and Year 11 about higher education.*

The coefficients generated by each of these models can found in **Appendix 4**. Prior to a discussion of the outcomes of the statistical modelling, however, Chapter 3 provides an overview of the background characteristics of the young people in the cohorts, including the extent to which they may have been identified or targeted under the Aimhigher: Excellence Challenge policy.





### 3. PROFILE OF THE COHORTS

The young people who are the subject of this report included those from both ‘treatment’ schools and ‘comparison’ schools. In 2001/02, the latter group comprised 794 Year 11 and 1542 Year 9 pupils from schools in Phase 3 EiC areas (12% and 17% of the respondents, respectively). The 2002/03 comparison cohort in Year 9 comprised 1,794 pupils (22% of the respondents) but the Year 11 comparison cohort was larger (4257, or 31% of the respondents) since it also included pupils who were part of the non-EiC comparison cohort survey.

The **Year 11** cohorts in 2001/02 and 2002/03 were largely similar in relation to their background circumstances, particularly in terms of young people’s socio-economic circumstances, the percentage with special educational needs and the proportion of young people who had been excluded for a fixed term during the previous academic year. However, while there were marginally higher proportions of female respondents to the surveys in both years, the proportion in 2001/02 was greater (at 52% against 47%) than in 2002/03 (48% against 47%) when there was less of a female response bias (data on sex was missing for one per cent of the cohort in 2002 and five per cent of the cohort in 2003). The percentage of young people who spoke English as an additional language was also greater in the 2002/03 cohort. Amongst the **Year 9** cohorts there was a very slight male response bias, with the proportion of boys who responded to the survey being greater in both in 2001/02 (51% against 48%) and in 2002/03 (49% against 45%).<sup>27</sup> Against other variables, the profile of the cohorts was similar, although the level of socio-economic and educational disadvantage was marginally greater amongst the 2002/03 cohort.

As indicated in Chapter 1, few of the young people responding to the surveys came from high performing schools. While more than one third of the Year 11 cohort came from schools with low levels of performance (schools in which fewer than 37% of young people achieved five or more GCSEs at A\* to C in the year in which pupils in the cohort began their Key Stage 4 courses), only six per cent of the Year 11 pupils included in the analysis came from schools in which attainment levels were high (schools in which more than 82% of young people achieved five or more GCSEs at A\* to C). Over one quarter of the Year 9 cohort were based in low performing schools; those in which Key Stage 3 attainment was at a mean of Level 4.56. Only 13% were

<sup>27</sup> Data on sex was missing for less than one per cent of the cohort in 2002 but six per cent of the cohort in 2003. The differences in the proportions of male and female respondents are small. The number of pupils and the number of schools involved are sufficiently large to ensure confidence in the analysis.

based in high performing schools (a mean of Level 5.6). What was the profile of the young people in these different schools?

### 3.1 Background Characteristics

Of those for whom the sex of the respondents to the surveys was known, just under half (all of whom completed the questionnaires in school), were male: 49% of the Year 11 cohorts and 50% of the Year 9 cohorts were boys. As indicated in **Table 3.1**, the average level of attainment of boys in both cohorts was lower at Key Stage 3 (a mean level of 4.8 for the Year 11 cohort and of 4.9 for the Year 9 cohort) than that of girls (a mean level of 5.0). This difference in attainment was maintained at GCSE for the Year 11 cohort (a mean capped eight score of 37 points compared with 32.7 points for boys, for example, and an average of 5.4 A\* to C grades compared with an average of 4.2 for boys).<sup>28</sup> However, such a simple comparison fails to take account of young people's background characteristics, home circumstances or academic progress, or of their experiences in school or through policy interventions such as Excellence Challenge/Aimhigher.

**Table 3.1 Attainment of Year 9 and Year 11 cohorts: by sex**

Attainment levels	Year 9		Year 11*	
	Male	Female	Male	Female
Prior attainment at Key Stage 2	3.9	3.9	N/A	N/A
Average Level at Key Stage 3	4.9	5.0	4.8	5.0
Total GCSE score	-	-	37.7	43.5
Average GCSE score	-	-	3.9	4.4
Capped 8 GCSEs	-	-	32.7	37.0
Number of A*-C grades	-	-	4.2	5.4
Number of A* to G grades	-	-	8.8	9.2
<b>N =</b>	<b>8578</b>	<b>7988</b>	<b>9,414</b>	<b>9,846</b>

Source: Matched data from National Pupil Database 2001/01, 2002/03

\* Data on sex was missing for 738 pupils - 3.7% of the cohort

The majority of the Year 11 pupils (70%), were from white UK backgrounds, with additional groups of young people from white European (1.5%) or white other backgrounds (1.2%).<sup>29</sup> Pakistani (4.5%) and Indian (4.4%) pupils formed the largest minority ethnic groups within the survey, while those from Black Caribbean (1.9%) and Black African (1.5%) heritage constituted a larger group than those of Bangladeshi (1.2%) or Chinese (<1%) pupils. The story in Year 9 was similar. The majority of the pupils (75%) were from white UK

<sup>28</sup> GCSE points are calculated on the basis of a grade A\* regarded as the equivalent to 8 points, grade A equivalent to 7 points and so forth.

<sup>29</sup> Note that the definitions of minority ethnic group background are those derived from 2002 PLASC data, since the changes in the 2003 data could not be back-matched to the 2002 Year 11 cohorts.

backgrounds while Indian (4.9%) and Pakistani (4%) pupils formed the largest minority ethnic groups within the survey.<sup>30</sup> Young people from Black Caribbean (3.2%) or Black African (2.6%) heritage constituted larger groups than those of Bangladeshi (0.82%) or Chinese (<1%) pupils.

Overall, average levels of attainment (see **Table 3.2**) at the end of Year 11 were highest amongst the Chinese pupils (who attained a mean of just over grade C at GCSE and a mean of 7.3 GCSEs at A\* to C) and lowest amongst the Black Caribbean pupils (who attained a mean of just under grade D at GCSE and a mean of 3.7 GCSEs at A\* to C). Amongst the Year 9 pupils (see **Table 3.3**), mean levels of performance at Key Stage 3 were again highest amongst Chinese pupils (a mean of level 5.9), but lowest amongst Pakistani pupils (a mean of 4.6). However, it should be acknowledged that these figures do not control for other background characteristics (sex, special educational needs or free school meals, for example) and so should be treated with caution.

**Table 3.2 Attainment by Year 11 cohorts: by Ethnicity**

	Prior attainment KS3	Total GCSE score	Average GCSE score	Capped 8 GCSEs	Number of A*-C grades	Number of A* to G grades	Total
White UK	5.0	40.7	4.2	35.0	4.8	9.0	14,018
White European	5.0	45.7	4.5	38.4	5.7	9.6	309
White other	4.7	37.5	4.0	33.3	4.3	8.7	245
Black Caribbean	4.5	35.5	3.7	31.2	3.7	8.6	378
Black African	4.4	40.8	4.2	34.9	4.8	9.1	300
Black other	4.5	37.1	3.8	31.9	4.0	8.9	153
Indian	4.9	44.3	4.6	38.1	5.7	9.2	872
Pakistani	4.3	37.8	3.9	32.4	4.1	8.9	909
Bangladeshi	4.6	42.7	4.1	35.2	5.2	9.6	246
Chinese	5.6	53.9	5.3	44.1	7.3	9.7	71
Other	4.7	40.3	4.1	34.5	4.7	9.0	482
Information not obtained	5.0	39.0	4.1	33.9	4.4	8.8	2015

Source: Matched data from National Pupil Database 2001/01, 2002/03

<sup>30</sup> Note that the definitions of minority ethnic group background are those derived from 2002 PLASC data to allow comparison with the Year 11 cohorts.

**Table 3.3 Attainment by Year 9 cohorts: by Ethnicity**

	Mean level at Key Stage 3	Total
White UK	5.0	12754
White European	5.3	137
White other	5.0	178
Black Caribbean	4.7	544
Black African	4.8	438
Black other	4.7	144
Indian	5.2	834
Pakistani	4.6	683
Bangladeshi	4.8	131
Chinese	5.9	76
Other	5.0	671
Information not obtained	4.8	526

Source: Matched data from National Pupil Database 2001/01, 2002/03

The degree of socio-economic deprivation amongst the cohorts was relatively high. Eighteen per cent of the Year 11 cohort and 23% of the Year 9 cohort were in receipt of free school meals, compared with an average of 11% of all pupils in England.<sup>31</sup> However, the majority of young people reported that they lived with at least one of their birth parents: at least 92% of both the Year 11 and the Year 9 pupils lived in a household with their mother (27% lived with their mother in both year groups), their father (three per cent for both year groups) or both parents (73% of both year groups). Some 11% of the Year 11 cohort (14% of the Year 9 cohort) suggested that at least one of their parents had been educated to degree level, and up to 20% that one of their parents had progressed into further education. Most, however, reported that their parents had left education at 16.<sup>32</sup>

### 3.2 The Cohorts in Aimhigher: Excellence Challenge

The cohorts in the ‘**treatment**’ groups (75% of the Year 11 cohorts and 81% of the Year 9 cohorts) and the ‘**comparison**’ groups differed in relation to a number of background characteristics, both within the cohorts and between the cohorts. While marginally more of the Year 11 pupils in Aimhigher:

<sup>31</sup> The proportion known to be *eligible* for free school meals in England is higher (14%) than the proportion known to be in receipt (10%), but information on eligibility for each individual pupil is not available to the research team. Data on young people in receipt of free school meals was obtained from PLASC (Pupil Level Annual School Census).

<sup>32</sup> Levels of parental education were obtained from pupil questionnaires and not from the parents themselves, so it is likely that there is a margin of error in this data, which should probably be regarded as indicative rather than definitive.

Excellence Challenge schools were in receipt of free school meals (18.1% compared with 16.8%), there were significant differences in terms of:

- ♦ the proportion with special educational needs (13.4% of the treatment group compared with 17.9% of the comparison group);
- ♦ the proportion with English as an additional language (11.3% of the treatment group compared with 17.9% of the comparison group).

This suggests that, while more pupils in the Aimhigher: Excellence Challenge Year 11 cohorts may be disadvantaged (in a socio-economic sense) than those in the comparison cohorts, the proportion of survey respondents from Aimhigher: Excellence Challenge schools who were suffering from other levels of disadvantage was lower.

By contrast, the proportions of disadvantaged young people amongst the Year 9 respondents from the treatment schools were significantly higher than those from the comparison schools.

- ♦ 23.6% of the respondents in the treatment schools were in receipt of free school meals, compared with 18.2% of those in the comparison group;
- ♦ 18.2% of the treatment group had special educational needs, compared with 14.4% of the comparison group;
- ♦ 13.7% of the treatment group spoke English as an additional language, compared with 11.5% of the comparison group.

Levels of attainment amongst young people in the treatment and comparison cohorts also varied. While mean levels of prior attainment amongst the Year 11 cohorts were the same (a mean of level 4.9 at Key Stage 3), levels of attainment at Key Stage 4 were marginally higher on some measures, with mean capped eight GCSE totals of 35 points for those in the treatment group, compared with 34.7 points for those in the comparison group. Similarly young people in Aimhigher: Excellence Challenge schools achieved a mean of 4.9 A\* to C grades compared to a mean of 4.7 for those in the comparison schools. Amongst the Year 9 cohorts, attainment at Key Stage 3 was higher amongst young people in the treatment schools (a mean level of 4.97) than amongst pupils in the comparison schools (a mean level of 4.88). These variations do not take account of any other background characteristics, however.

As part of the Aimhigher: Excellence Challenge policy, two specific cohorts of young people were identified by partnerships. The first of these included young people designated as part of the **widening participation** cohort; that is, those who were in learning (whether pre- or post-16) who had the ability to progress to higher education, but who came from predominantly disadvantaged backgrounds without any history of higher education. Just

below eight per cent of the young people in the Year 11 cohorts in the study (and five per cent of the Year 9 cohorts) were identified as part of the widening participation group in their school.<sup>33</sup> Similar proportions of boys and girls (7.6% of the year group in each case) were included in this group in Year 11. Proportionally more girls than boys were evident in the Year 9 cohort, however, with females composing 56% of the widening participation cohort (6.5% of all girls and 4.5% of all boys in the year group were designated as widening participation pupils).

There were some notable differences in representation from minority ethnic groups. Compared to a mean representation of 7.6% across all ethnic groups in Year 11, a higher proportion of pupils from Black African (16%), Chinese (15.5%) and White European backgrounds (12.6%) were included. By contrast, Indian (5.8%) and Bangladeshi (3.3%) pupils were less well represented. Mean levels of attainment were, on average, higher amongst the Year 11 widening participation cohorts, both at Key Stage 3 and at GCSE, than amongst those not so designated, suggesting that targeting, on the whole had been effective in identifying those with the appropriate levels of ability. The mean number of A\* to C grades achieved by young people in the widening participation cohort, for example, was 6.3, compared to a mean of 4.7 for those outside the cohort.

The story in Year 9 was rather different, with a far higher proportion of pupils from Black Caribbean backgrounds included in the widening participation cohort: compared to a mean representation of 5.4% across all ethnic groups in Year 9, representation of those from Black Caribbean backgrounds was 11.9%. Young people from Indian (1.8%), Pakistani (3.2%), Black African (4.1%) and Bangladeshi (4.6%) backgrounds were less well represented. However, as in Year 11, mean levels of attainment were, on average, higher amongst the Year 9 widening participation cohorts than amongst those not so designated, with young people in this group attaining a mean level of 5.08.

The second cohort included those who would be identified as **gifted and talented**. Under Aimhigher: Excellence Challenge this group was confined (for funding purposes) to those who were in post-16 education. Pre-16, the gifted and talented cohort was funded under the EiC initiative in Phase 1 and 2 areas (10.6% of the Year 11 cohort and 9.9% of the Year 9 cohort in these areas was designated as gifted and talented) and in Phase 3 areas (8.2% of the Year 11 cohort and 5.8% of the Year 9 cohort was designated as gifted and talented). Under EiC, participating schools were required to identify a gifted

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<sup>33</sup> This information, along with policy-related information, such as whether or not young people were part of the gifted and talented cohort, whether or not they had been referred to a learning mentor or Learning Support Unit and their level of attendance, for instance, was collected from schools on a pupil-by-pupil basis. It should be noted that some EiC Phase 3 schools outside Excellence Challenge/Aimhigher had identified young people as members of the widening participation cohort (less than one per cent of all respondents), even though Phase 3 schools were not officially funded under Excellence Challenge/Aimhigher at the time of the research.

and talented cohort of some five to ten per cent of each year group in Key Stages 3 and 4. At least two thirds of this cohort are expected to be those with the highest levels of attainment in academic areas of the curriculum.<sup>34</sup> No specific policy-related funding was available for this group in EAZ areas, although some identified such young people among their pre-16 cohorts. Amongst the young people in the study, 10% of the Year 11 cohort and 9.1% of Year 9 cohort were designated as gifted and talented.

The picture within the gifted and talented cohort also demonstrated some variations. Some difference between the sexes was evident, with 11% of the females compared to 10% of males being so designated in Year 11 and 9.8% of the females compared to 8.1% of males being so designated in Year 9.<sup>35</sup> In the Year 11 cohort, compared to a mean of 10.6% across all ethnic groups, higher proportions of young people were from Chinese (24%), Black other (18%), white other (14%) and Black African (13%) backgrounds, while those from Indian (6.5%) Black Caribbean (7.1%) and Bangladeshi (7.7%) backgrounds were less well represented. Mean levels of attainment amongst young people designated as gifted and talented were higher than for other young people, with an average of 8.4 GCSEs at grades A\* to C (compared to a mean of 4.4 for the rest of the cohort) and a mean GCSE average score of 5.6 (just under a grade B), compared with a mean GCSE average score of 4 (a grade D for those outside the designated cohort).<sup>36</sup>

The picture was rather different in Year 9. While the proportion of young people from a Chinese background was still very much higher (25%) than might be expected, given the mean representation of 9.9% across all ethnic groups, the proportions of young people from white European (13.1%), Indian (11.8%) and Black other (10.4%) backgrounds were also high. Those from Pakistani (6%) and Bangladeshi (4.6%) backgrounds were less well represented. Young people in the Year 9 gifted and talented cohort appeared, on average, to have made more progress from Key Stage 2 to 3 than the rest of the cohort. Amongst those designated as gifted and talented, the mean level at Key Stage 2 was 4.6, that at Key Stage 3 was 6.1 (a difference of one and a half levels). Amongst the remainder of the cohort the mean level at Key Stage 2 was 3.8, that at Key Stage 3 was 4.8 (a difference of one level).

<sup>34</sup> In the first data collection exercise carried out by the evaluation consortium, schools were asked to identify gifted pupils and talented pupils separately, but in practice it was difficult for schools to provide the information in this way, and subsequent data has been gathered for the whole gifted and talented cohort.

<sup>35</sup> Indeed, 53% of the Year 11 gifted and talented cohorts were female, while 45% were male. Two per cent of the young people for whom sex data was not available were also designated as gifted and talented. In the Year 9 cohort 50.6% of the Year 9 gifted and talented cohorts were female, while 44.5% were male. Just under five per cent of the young people for whom sex data was missing in this cohort were designated as gifted and talented.

<sup>36</sup> These figures do not compare gifted and talented pupils with other pupils with the same prior attainment and background characteristics (sex, ethnicity or free school meals, for example) and so should be treated with caution.



It is possible for young people to be identified in both groups (both pre- and post-16). Indeed, 21% of the young people in the Year 11 widening participation cohort were also identified as gifted and talented.<sup>37</sup> This means that some 79% of the widening participation cohort were not designated as gifted and/or talented, but were still seen as having the ability to progress to higher education with the appropriate encouragement and support. In Year 9, 18% of the young people in the widening participation cohort were identified as gifted and talented.

There are some clear differences between the Year 11 and the Year 9 pupils in terms of representation by sex and ethnicity in the widening participation and gifted and talented cohorts. However, it would appear that some groups, to date (and pupils from Indian and Bangladeshi backgrounds in particular) seem less likely than other young people to have been designated as members of either policy-related cohort. The apparent low level of representation of young people from Indian backgrounds is especially surprising when one looks at mean attainment levels at Key Stage 3 and 4. It should be acknowledged that the Year 9 gifted and talented cohort includes a high proportion of Indian pupils, but, overall, their representation in either the gifted and talented or widening participation cohorts is low.<sup>38</sup>

While one can provide a profile of the Aimhigher: Excellence Challenge cohorts and examine the attainment outcomes for those designated as widening participation and gifted and talented, this provides little indication of the relative impact of the policy. Overall attainment amongst the widening participation cohort might appear to be higher than for the non-widening participation cohort, for example, but does this indicate that the policy has led to such differences emerging? Other factors, related to sex, prior attainment, individual background characteristics (such as ethnicity, fluency in English and home circumstances), attendance and school factors (including performance levels, type and location) have emerged from previous research as significant indicators of attainment. In the following chapters, the report seeks to explore the association between Excellence Challenge/Aimhigher-related inputs and young people's attainment, attitudes and aspirations, taking into account their background characteristics, prior attainment and home and school circumstances.

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<sup>37</sup> Of the gifted and talented cohort, 16.5% were identified as part of the widening participation cohort.

<sup>38</sup> The probability of any young person being designated as a member of either cohort, or of being referred to a Learning Mentor, has not yet been investigated. This would seem to be a worthwhile exercise for the future.

## 4. THE IMPACT OF AIMHIGHER: EXCELLENCE CHALLENGE ON ATTAINMENT

The economic analysis that has been conducted for this evaluation (see Emmerson *et al.*)<sup>39</sup> suggests that the implementation of the Aimhigher: Excellence Challenge policy may have had an impact on young people's attainment at Key Stage 3 (achievement of level 4 or above in English, Mathematics and Science) and Key Stage 4 (GCSE attainment) in the 'treatment' schools, with an improvement in such attainment outcomes greater than that noted in the comparison schools. Moreover, while the policy did not appear to be associated with increased aspirations to tertiary or higher education amongst younger pupils (those in Year 9), there is a suggestion that the Aimhigher: Excellence Challenge policy may have contributed to an estimated increase in the proportion of Year 11 pupils stating that they intend to participate in tertiary education. What aspects of the policy, however, have contributed to these apparent impacts? Are there any activities, or combinations of activities, implemented under the aegis of Aimhigher: Excellence Challenge, that appear to have a significant association with different levels of attainment or with enhanced aspirations to higher education?

### 4.1 The Analysis

An exploration of the relative impact of Aimhigher requires a systematic approach to the analysis of the available statistical data. In order to assess the ways in which, for example, young people's attitudes towards higher education are associated with the range of different policy-related and other inputs to which young people are exposed, a complex set of variables need to be examined. Young people in participating schools and colleges come from a variety of home and school backgrounds, have different academic abilities and have been exposed, to varying degrees, to a range of different educational experiences, including, for some, different Aimhigher: Excellence Challenge activities. All of these could be expected to have an impact on their awareness of, and attitudes towards, higher education, as well as on their aspirations to a university education.

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<sup>39</sup> EMMERSON, C., FRAYNE, C., MCNALLY, S. and SILVA, O. (forthcoming). *The early impact of Aimhigher: Excellence Challenge on pre-16 outcomes: an economic evaluation.*

In conducting the statistical analysis for this paper, a progressively focused approach was adopted. To begin with, within each cohort, young people's responses to the surveys were combined (within year cohorts) to derive a series of measures relating to their attitudes and experiences. Since the questions were replicated in each survey, these measures were calculated in the same way for each of the various cohorts of students. However, in the case of young people in Year 10 and Year 11, an additional measure, specifically relating to their attitudes to the future, was also derived. A similar strategy was deployed for both the schools' survey and the teachers' survey, in order to develop a series of composite measures of provision and of teacher attitudes and perceptions of Aimhigher.

Following data matching, a series of different statistical tests, including analyses of variance, multiple regression analyses and t-tests, were then used to identify the measures that were subsequently incorporated into the series of multilevel and logistic regression models developed to explore the impact of Aimhigher and the various activities that have been implemented under the initiative.<sup>40</sup> Cross-sectional and longitudinal models were then constructed to look at a range of different 'hard' (attainment) and 'soft' (attitudes and aspirations) outcome measures. The explanatory power of these models varied, but was generally very high for the attainment models, particularly at Key Stage 4. The inclusion of background variables, prior attainment and pupil attitudes reduced the variance at pupil level by between two thirds and three quarters.

**Table 4.1 Percentage of variance explained by multilevel models**

Multilevel models	Percentage of pupil level variance explained		
	Year 9	Year 11	
		Cross-sectional	Longitudinal
Key Stage 3 average level	73%	-	-
Key Stage 3 average level (English)	60%	-	-
Key Stage 3 average level (mathematics)	65%	-	-
Attitudes to education	-	32%	-
Total GCSE score	-	75%	71%
Capped 8 GCSEs	-	77%	74%
Average GCSE score	-	74%	71%
5 A*-C grades	-	Logistic model	Logistic model
Aspirations to higher education	Logistic model	Logistic model	Logistic model

<sup>40</sup> A description of the technique can be found in Appendix 2, along with the various background and interaction variables that were included in the modelling process.

## 4.2 The Impact of Aimhigher: Excellence Challenge on Attainment (Year 11)

The analysis that was conducted for this study sought to explore the relationship, if any, between specific aspects of the policy (such as the designation of a widening participation cohort) and policy-related activities (such as university visits and summer schools) with higher levels of attainment at the end of Key Stage 4. The initial comparative analyses (outlined in Section 3.2) suggested that, on the basis of the raw data alone, mean levels of attainment were higher amongst the Year 11 widening participation cohorts and the gifted and talented cohorts. The outcomes of the modelling process indicated that these differences remained evident, even when young people's sex, ethnicity, prior attainment, socio-economic, home and school circumstances were taken into account.

In summary, once all background characteristics at school and pupil level had been included in the analysis, associations were identified between the following policy interventions and higher attainment at Key Stage 4:

- ◆ Designation as a member of the **widening participation cohort** was associated with higher levels of attainment in terms of:
  - total score at GCSE (an additional 1.16 GCSE points, or just over one grade at GCSE);
  - capped eight GCSE score (an additional 0.64 GCSE points or just under one grade at GCSE);
  - average GCSE score (an additional 0.06 points per GCSE)
  - an increased likelihood of achieving five of more A\* to C grades at GCSE – young people in the widening participation cohort were one and a half times more likely to have achieved such grades than young people with the same background characteristics who were not so designated.
- ◆ Designation as a member of the **gifted and talented cohort** was associated with higher levels of attainment in terms of:
  - total score at GCSE (an additional 4.42 GCSE points);
  - capped eight GCSE score (an additional 3.13 GCSE points);
  - average GCSE score (an additional 0.4 points per GCSE);
  - an increased likelihood of achieving five of more A\* to C grades at GCSE - young people in the gifted and talented cohort were two and three quarter times more likely to have achieved such grades than young people with the same background characteristics who were not so designated.
- ◆ Young people who had seen a **Learning Mentor** in low performing schools were one and a quarter times more likely than young people with the same background characteristics in low performing schools who had not been mentored to have attained five of more A\* to C grades at GCSE. Their overall level of attainment was also marginally greater than young people who had not been mentored or who had been mentored in other types of school.

These findings suggest that there may be some significant associations between the policy-related interventions and ‘hard’ outcomes in terms of pupil attainment in Year 11. However, before exploring these associations in more detail, it is worth summarising the key background factors that appear to be associated with GCSE performance that is higher than would have been predicted from young people’s prior attainment, in order to ascertain the extent to which schools and partnerships might have the capacity to intervene to raise attainment further.

#### **4.2.1 The impact of individual pupil characteristics<sup>41</sup>**

As suggested by the raw data, and across all GCSE outcome measures at Key Stage 4, **girls’** attainment in both Year 11 cohorts was higher than that of boys, with higher GCSE scores and a greater likelihood of achieving five or more A\* to C grades. Girls were more than one and a half times as likely as boys to have achieved five or more such higher grades, even when prior attainment and other background characteristics were taken into account, a difference that was evident in both the cross-sectional (an odds multiplier of 1.58) and longitudinal (an odds multiplier of 1.45) analyses.

The **minority ethnic group** differences noted in the raw data (with highest attainment amongst the Chinese pupils and lowest attainment amongst the Black Caribbean pupils) were not statistically evident once other background characteristics and prior attainment had been controlled for.<sup>42</sup> A range of other ethnic differences emerged from the cross-sectional analysis, however. These suggested that, taking prior attainment into account, pupils from African and Bangladeshi backgrounds had higher than expected GCSE point scores at Key Stage 4 than young people from other ethnic backgrounds. African pupils were also more than twice as likely to have achieved five or more higher grades at GCSE. Sex differences were noted amongst young people from minority ethnic groups: while Bangladeshi pupils attained a mean of 3.5 GCSE points more than other pupils (other than African pupils) with the same prior attainment, the mean total GCSE score for Bangladeshi girls was marginally lower (by 0.28 points) than for Bangladeshi boys. Black Caribbean girls were 1.7 times more likely than Black Caribbean boys to have achieved five or more A\*to C grades, though it should be noted that the number of such pupils was relatively small. It should be noted, however, that these minority ethnic group differences were not apparent in the longitudinal analysis, suggesting that they may be primarily the result of a cohort effect.

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<sup>41</sup> The text in these section draws on Tables 1 to 4 and 10 to 13 in Appendix 5.

<sup>42</sup> There was an indication that Black Caribbean pupils who were higher attainers at Key Stage 3 appeared to make less progress to Key Stage 4 than other higher attainers. The mean capped eight GCSE score for such pupils was 0.14 GCSE points lower than for young people with the same background characteristics but from different ethnic groups, while the mean total score was lower by 0.21 GCSE points.

On the whole, young people with **English as an additional language** had higher levels of GCSE attainment than would have been expected from their prior attainment at Key Stage 3, equivalent to 3.22 GCSE points across both Year 11 cohorts. Subsequent investigations suggested that young people who were bi-lingual had higher levels of attainment (in terms of total GCSE or capped eight GCSE scores) than native speakers or those who were relatively new to English or becoming familiar with it.

Pupils with higher levels of **socio-economic disadvantage** (those in receipt of free school meals, or with few books in the home, for instance) and young people with **special educational needs** had lower levels of attainment across all measures at Key Stage 4, as did young people who had been excluded from school for at least one fixed term during the previous academic year. Levels of attainment were lower than expected (across all measures) for pupils who had not been in their school since the start of Year 7; such young people were only two thirds as likely as their peers from the same backgrounds and with the same level of prior attainment to obtain five or more higher grade GCSEs, for example.

While young people who lived with both parents at home had higher levels of attainment than other pupils (total and capped GCSE score, average GCSE score and likelihood of achieving five or more GCSEs at grades A\* to C), those with at least one birth parent in their home had higher levels of attainment than young people who were looked after or who lived only with other members of their family. Parental levels of education also appeared significant, with paternal education to degree level associated with higher levels of GCSE attainment across every measure (including the likelihood of achieving five or more GCSEs at grades A\* to C), and maternal education to at least 16 associated with total and capped eight GCSE scores. Higher than average mean GCSE scores were associated with mothers educated to degree level and fathers educated to at least post-16.

These findings suggest that there may still be a degree of educational underperformance that is associated with young people's home circumstances (particularly poverty, mobility and levels of parental education) and with educational support needs. They also suggest that some of the apparent social barriers to high attainment at Key Stage 4 and, subsequently therefore, entry to higher education have not yet been fully addressed through policy interventions.

#### **4.2.2 The impact of pupil attitudes**

Young people with **positive attitudes** towards school and education (including post-16 education) and with good (self-reported) attendance and punctuality were associated with higher than expected levels of attainment across all measures at GCSE (an average 4.74 total GCSE points or an

additional GCSE at grade C),<sup>43</sup> although they were only marginally more likely than other pupils to have achieved five or more GCSEs at A\* to C grades. Those who reported that they found **helpful** the **teaching strategies** that were used in their school, and who noted that they engaged with pupils in other schools in wide variety of activities were also associated with higher levels of attainment, once prior attainment and all other background characteristics were taken into account. The effect size of this latter variable was not as great as that for positive attitudes to education (a mean of 0.63 GCSE total points, for instance). However, it would suggest that the creation of a teaching and learning environment that took account of young people's individual learning needs, and which facilitated the development of a positive attitude to education, was important in promoting higher levels of attainment amongst pupils.

Indeed, the longitudinal analysis of the 2001/02 Year 10 cohort would support this view.<sup>44</sup> Young people whose attitudes towards education appeared to have become more positive between Year 10 and Year 11 were associated with higher levels of attainment at Key Stage 4, both in terms of GCSE points and their likelihood of achieving five or more GCSEs at grade C and above (though the effect size was small). Young people who became involved in a wider range of curriculum and non-curricular activities (such as sports and theatre visits) between Year 10 and Year 11 were also associated with higher GCSE point scores (an additional 0.25 points for capped eight GCSE).

#### **4.2.3 The impact of school characteristics**

At a school level, levels of attainment were lower than expected (across all measures) in schools where attainment at Key Stage 4 had been low when young people had started their Year 10 course. Young people with high levels of prior attainment appeared to have made less progress in such schools (in terms of total GCSE score, capped eight GCSE score and the likelihood of achieving five or more GCSEs at grades A\* to C) than their peers in other schools. This picture was moderated in low performing schools where young people had seen a Learning Mentor. In these cases, young people performed better than young people who had been mentored in other types of schools. This might suggest, of course, that lower performing schools had targeted their Learning Mentor support towards those who might have been thought to benefit most from individual interventions: mentoring in low performing schools was associated with an increased likelihood of achieving five or more GCSEs at grades C and above.

Pupils who were in schools where staff felt that all young people in the school had benefited from more adult or teacher support during the previous year had

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<sup>43</sup> The effect size for this and for all other continuous variables has been calculated as the square root of 2 (1.42) multiplied by the coefficient of the variable. This estimates the mean effect size.

<sup>44</sup> Tables 10 to 13 in Appendix 5.

scored more highly at GCSE than young people in schools where staff had not reported such benefits. Equally, levels of performance were higher than expected (given prior attainment and other background characteristics) amongst pupils in schools where teachers had expressed positive views of pupils, in terms of their aspirations and their behaviour, and where teachers believed there was active parental support and interest. There was also an association with higher mean total GCSE scores and higher mean average GCSE scores amongst young people who attended schools where teachers believed that it was important that a wide range of young people should be encouraged to go into further education. At school level, therefore, it would appear that the creation of a stable school climate in which teachers had a positive view of their pupils and of their capabilities, and in which parental support was fostered, was a key factor in promoting higher levels of attainment amongst pupils.

#### **4.2.4 The impact of policy interventions**

As indicated in section 4.2, being designated as a member of the widening participation or the gifted and talented cohort appeared to be significantly related to higher than expected levels of attainment at Key Stage 4. At this stage, participation in widening participation activities appear to have been associated with better outcomes at GCSE across all measures and for all such pupils, although the effect size of the interventions is relatively small (approximately one additional GCSE point). The impact appeared greater in relation to the achievement of five A\* to C grades, where young people in the gifted and talented cohort were one and a half times as likely to achieve such grades as young people not so designated.

The longitudinal analysis supports the view that being part of the widening participation cohort was associated with higher levels of attainment. Young people who were designated as a member of the widening participation cohort only when they were in Year 11 (2002/03), appeared, on average, to have attained an additional 1.18 GCSE points more than would have been expected given their prior attainment and other characteristics. The impact appears to have been greater, however, for those who had been so designated in both Year 10 and Year 11, with an associated attainment of an additional 1.68 GCSE points. Indeed young people who had been part of the widening participation in both years were nearly twice as likely to have achieved five or more GCSEs at grades A\* to C (an odds multiplier of 1.94); those who were designated only when they were in 2002/03 were also more likely than other young people with the same prior attainment to have achieved such grades, though the effect was not as great (an odds multiplier of 1.45).

The cross-sectional analysis indicated that the apparent impact of being designated as part of the gifted and talented cohort was greater than being a member of the widening participation cohort, equivalent to an additional GCSE at grade D (in terms of total GCSE points) or to increasing three grade



Ds to three grade Cs (in terms of capped eight GCSEs). For some young people, the impact of being in the cohort was more marked than for others, with the improvement in GCSE scores being more evident amongst the young people who were at the lower end of the cohort. It should be noted that there may well be a ceiling effect for young people at the top end of the cohort, but the findings suggest that the gifted and talented strand of EiC in Aimhigher: Excellence Challenge areas has been effective in reducing the differential between the highest and lowest performance of young people in the cohort. African pupils in the cohort achieved higher capped eight GCSE scores than other young people in the cohort (an additional 3.53 GCSE points compared with 3.13 points) and higher mean GCSE scores (the average score per GCSE was 0.35 points higher than other young people in the gifted and talented cohort). However, their likelihood of achieving five or more GCSEs at grade C or above was no higher than for the rest of the young people in the gifted and talented cohort.

The cumulative impact of being part of the gifted and talented over two years (established through the longitudinal analysis) was more clearly evident in relation to the probability of achieving five or more GCSEs at grades A\* to C than to the total number of GCSE points achieved. Young people who had been part of the cohort for two years were more than four times more likely to have achieved these higher grades than their academic and social peers. Being designated as part of the cohort in Year 10 or Year 11 alone was still associated with a probability of achieving five or more higher grade GCSEs, although the effect size was smaller than for those who had been so designated in both years (just over twice as likely as other young people with the same prior attainment and background characteristics). Such a designation in either year was also associated with higher than expected GCSE point scores, particularly for those young people who were targeted during Year 11.

**Figure 4.1** provides one illustration of what the policy interventions might look like in terms of GCSE attainment for young people with the same background characteristics (apart from sex), but with different policy-related designations. It is important to note that the illustration is not based on raw data alone, but on the outcomes that might be expected were the young people without any contra-indications (such as special educational needs or free school meals), had no behavioural difficulties and where they had expressed average attitudes to education and to the teaching strategies used in their school, for example. The base case (boy or girl at Level 5 at Key Stage 3) is drawn from the multilevel models, which indicate a mean performance difference of 8.7 GCSE points per Key Stage 3 level.<sup>45</sup>

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<sup>45</sup> For the purpose of illustration, the grade difference has been simplified. Theoretically, a boy at Level 5 would have attained 43.61 points, a girl would have achieved 45.4 points.

**Figure 4.1 Potential Key Stage 4 outcomes for 2001/02 and 2002/03 Aimhigher: Excellence Challenge survey cohorts based on Key Stage 3 prior attainment**

Hypothetical Pupil	Hypothetical achievement (capped eight GCSEs)
Boy: level 5 at Key Stage 3	3 grade Bs and 5 grade Cs (or 43 points)
Boy: level 5 at Key Stage 3 – widening participation cohort	1 grade A, 2 grade Bs and 5 grade Cs (or 44 points)
Boy: level 5 at Key Stage 3 – gifted and talented cohort	1 grade A, 4 grade Bs and 3 grade Cs (or 46 points)
Girl: level 5 at Key Stage 3	1 grade A, 3 grade Bs and 4 grade Cs (or 45 points)
Girl: level 5 at Key Stage 3 – widening participation cohort	2 grade As, 2 grade B and 4 grade Cs (or 46 points)
Girl level 5 at Key Stage 3 – gifted and talented cohort	1 A*, 1 grade A, 3 grade Bs and 3 grade Cs (or 48 points)

As the Figure suggests, a boy who had achieved Level 5 at the end of Key Stage 3 and had then been designated as part of the gifted and talented cohort would have achieved 46 points (out of a possible 64 points) for capped eight GCSEs. A girl with the same prior attainment and background characteristics would have achieved 48 points.

The apparent impact of Aimhigher: Excellence Challenge was not limited to the outcomes that were associated with being designated a member of the widening participation (or gifted and talented) cohort, however. The longitudinal analysis (Tables 10 to 13 in Appendix 5) indicates that four specific interventions were associated with young people who achieved higher levels of attainment at Key Stage 4 than would have been anticipated from their prior attainment alone. These interventions, two of which were activity based and two of which were more informal and individually-focused, included:

- ♦ Attendance at **summer schools** (or equivalent) both in (or prior to) Year 10 and in (or prior to) Year 11. Young people who indicated that they took part in such schools in both years were associated with higher levels of attainment in terms of:
  - total score at GCSE (an additional 1.12 GCSE points, or just over one grade at GCSE). Young people who took part in a summer school prior to Year 10 alone were associated with an additional 0.77 GCSE points;
  - capped eight GCSE score (an additional 0.64 GCSE points or just under one grade at GCSE);
  - average GCSE score (an additional 0.09 points per GCSE);

- an increased likelihood of achieving five of more A\* to C grades at GCSE (an odds multiplier of 1.32).
- ◆ **Visits to university** during Year 10 and/or Year 11. Young people who said that they took part in such visits in both years were associated with higher levels of attainment in terms of:
  - total score at GCSE (an additional 1.1 GCSE points, or just over one grade at GCSE);
  - capped eight GCSE score (an additional 0.86 GCSE points or just under one grade at GCSE);
  - average GCSE score (an additional 0.11 points per GCSE).
- ◆ **Discussions with family or friends about university.** Over 70% of the young people included in the longitudinal analysis reported such discussions in Year 11, with nearly two thirds of these having spoken to both family and friends. Young people who noted such discussions were associated with higher levels of attainment in terms of:
  - total score at GCSE (an additional 1.6 GCSE points, or just over one grade at GCSE). For girls, such discussion was associated with a lower additional score – an additional 0.78 GCSE points compared with girls with the same background characteristics and prior attainment who had not taken part in such discussions.
  - capped eight GCSE score (an additional 1.03 GCSE points or just over one grade at GCSE). For girls, such discussion was associated with a lower additional score – an additional 0.45 GCSE points compared with girls with the same background characteristics and prior attainment who had not taken part in such discussions.
  - average GCSE score (an additional 0.12 points per GCSE ). For girls, such discussion was associated with a lower additional score – an additional 0.06 GCSE points per GCSE compared with girls with the same background characteristics and prior attainment who had not taken part in such discussions.<sup>46</sup>
  - an increased likelihood of achieving five of more A\* to C grades at GCSE (an odds multiplier of 1.24).
- ◆ **Discussions with university staff or undergraduates about university.** Just over two thirds of the young people in the longitudinal survey (36%) reported such discussions in Year 11, with one third of these reporting talking to both university staff and undergraduates.
  - **Boys and girls** who reported such discussions were associated with higher levels of attainment in terms of:
    - an increased likelihood of achieving five of more A\* to C grades at GCSE (an odds multiplier of 1.19).

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<sup>46</sup> The difference between girls who had and who had not taken part in such discussions with family and friends is interesting, although the reason is not immediately obvious. Does it suggest, for example, that girls who do not feel the need for such discussions are more confident, autonomous learners, or is there some other reason? By contrast, the relative impact of discussions with university staff and students was more positive for girls.

- **Girls** who reported such discussions were associated with higher levels of attainment in terms of:
  - total score at GCSE (an additional 0.64 GCSE points compared with girls with the same background characteristics and prior attainment who had not taken part in such discussions);
  - capped eight GCSE score (an additional 0.51 GCSE points compared with girls with the same background characteristics and prior attainment who had not taken part in such discussions);
  - average GCSE score (an additional 0.06 points per GCSE compared with girls with the same background characteristics and prior attainment who had not taken part in such discussions).

Over half of the young people in the longitudinal study (54%) recorded discussions about higher education with teachers and Personal Advisers, nearly half of these (46%) saying they had talked to both school and Connexions staff. However, no statistically significant associations were noted between such discussions and pupil attainment.

The apparent impact of these interventions on pupil attainment should be viewed with caution at this stage. It may be that the activities prompted higher levels of motivation at Key Stage 4, leading to higher levels of attainment. Equally, the young people who took part in the activities may have already been highly motivated, and this may have been why they took part in the activities. Nonetheless, it is encouraging that the activities that are widely cited by partnership coordinators, teachers and university staff as key factors in motivating young people (see for example, Morris *et al.* forthcoming,<sup>47</sup> Judkins *et al.* forthcoming<sup>48</sup> and West *et al.* forthcoming<sup>49</sup>) also appear to be associated with higher levels of achievement.

The association between attendance at summer schools in both Year 10 and Year 11 and young people's probability of attaining five or more GCSEs at A\* to C, (once all pupil level and school-level background characteristics have been taken into account) is graphically illustrated in **Figure 4.2**. This figure also shows the apparent impact of being a member of the widening participation or gifted and talented cohorts, and of seeing a Learning Mentor. At the lower end of the attainment curve (that is, up to one level at Key Stage 3 below the mean of 5.03 for the cohort) the association with being designated as a member of the gifted and talented cohort increases the probability of achieving five or more A\* to C grades from 11% to 34%, while being a member of the widening participation cohort increases the probability to 19%

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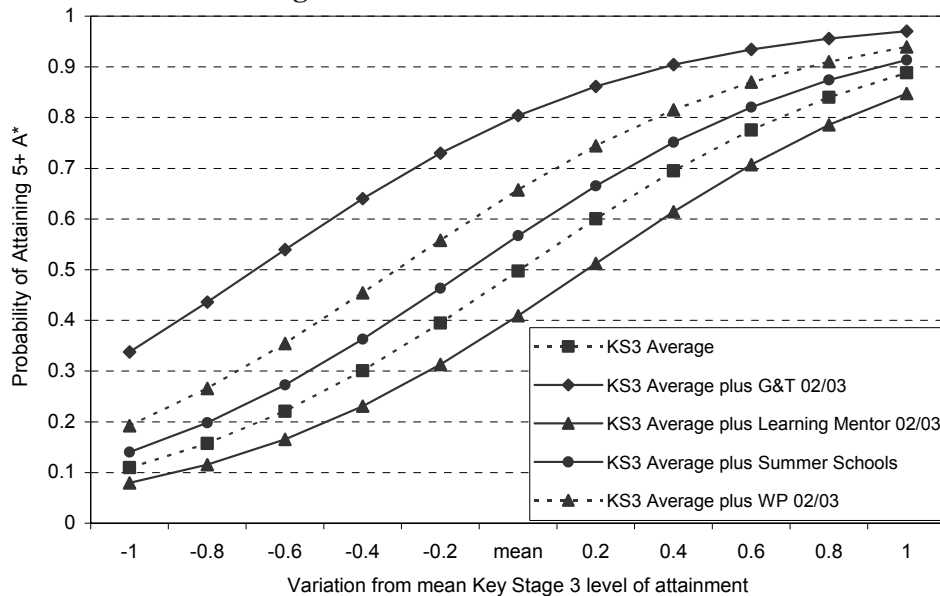
<sup>47</sup> MORRIS, M., GOLDEN, S., IRELAND, E. and JUDKINS, M. (forthcoming). *Evaluation of Aimhigher: Excellence Challenge: the Views of Partnership Coordinators 2004*.

<sup>48</sup> JUDKINS, M., GOLDEN, S., IRELAND, E. and MORRIS, M. (forthcoming). *Implementing Aimhigher: Excellence Challenge – the Experience of Ten Partnerships*.

<sup>49</sup> PENNELL, H., WEST, A. and HIND, A. (forthcoming). *Survey of Higher Education Providers 2004*.

and attendance at summer schools in both Year 10 and Year 11 increases it to 14%. The probability of such achievement for those who had seen a Learning Mentor was lower, at eight per cent. At the mean for the cohort (where the probability of achieving five or more higher grades is 50%), the differences are even greater, with the probability of such high level achievement for the gifted and talented cohort being 80%, that for the widening participation cohort 66% and that for summer school attendance 57%. Even at the upper end of attainment, where young people's prior attainment was one level higher than the mean for the cohort (that is, a Key Stage 3 level of 6.03), the gifted and talented cohort were eight percentage points more likely than other young people with the same prior attainment to have achieved five or more A\* to C grades (97% probability compared with 87% probability). The values for the widening participation cohort (94%) and those who reported attending summer schools in Year 10 and Year 11 (91%) were only marginally lower.

**Figure 4.2 Impact of interventions on the probability of achieving five or more A\* to C grades.**



**4.3 The Impact of Aimhigher: Excellence Challenge on Young People in Year 9<sup>50</sup>**

The story for young people in Year 9 was largely similar to that of Year 11, with significant associations between being a member of either the widening participation cohort and/or the gifted and talented cohorts and higher levels of attainment. Participation in out-of-term events, such as summer schools or related holiday activities, and the opportunity to discuss higher education with staff and students from higher education providers were also associated with higher levels of attainment. In summary, once all background characteristics at school and pupil level had been included in the analysis, positive

<sup>50</sup> The text in this section refers to Tables 15 to 17 in Appendix 5.

associations were identified between the following policy interventions and attainment at Key Stage 3:

- ◆ Designation as a member of the **widening participation cohort** was associated with higher levels of attainment in terms of:
  - higher average levels at Key Stage 3 overall (an additional 0.18 of a level, equivalent to approximately 6.48 months of progress);<sup>51</sup>
  - higher average levels in Key Stage 3 English (an additional 0.17 of a level, equivalent to approximately 6.12 months of progress);
  - higher average levels at Key Stage 3 maths (an additional 0.2 of a level, equivalent to approximately 7.2 months of progress).
- ◆ Designation as a member of the **gifted and talented cohort** was associated with higher levels of attainment in terms of:
  - higher average levels at Key Stage 3 overall (an additional 0.37 of a level, equivalent to approximately 13.32 months of progress – for African pupils the increase was lower at 0.04 of a level);
  - higher average levels in Key Stage 3 English (an additional 0.3 of a level, equivalent to approximately 10.8 months of progress – for young people in low performing schools, the increase was lower at 0.23 of a level);
  - higher average levels at Key Stage 3 maths (an additional 0.43 of a level, equivalent to approximately 15.48 months of progress).
- ◆ Participation in a **summer school** was associated with higher levels of attainment in terms of:
  - higher average levels at Key Stage 3 overall (an additional 0.07 of a level, equivalent to approximately 2.52 months of progress);
  - higher average levels in Key Stage 3 English (an additional 0.06 of a level, equivalent to approximately 2.16 months of progress);
  - higher average levels at Key Stage 3 maths (an additional 0.08 of a level, equivalent to approximately 2.88 months of progress).
- ◆ Discussions with **university staff or undergraduates about university** were associated with higher levels of attainment in terms of:
  - higher average levels at Key Stage 3 overall (an additional 0.03 of a level, equivalent to approximately 1.08 months of progress);
  - higher average levels in Key Stage 3 English (an additional 0.02 of a level, equivalent to approximately 0.72 months of progress);
  - higher average levels at Key Stage 3 maths (an additional 0.04 of a level, equivalent to approximately 1.44 months of progress).

As in Year 11, these findings suggest that there may be some significant associations between the policy-related interventions and attainment outcomes

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<sup>51</sup> The various equivalents for months of progress are based on an expected progression of at least one level from Key Stage 2 to Key Stage 3 over a period of 36 months from Year 6 to Year 9. The DfES state that the target for 14 year olds at Key Stage 3 is Level 5 or Level 6.

for young people in Year 9. Indeed, being designated as a member of either cohort was the most significant factor associated with higher levels of attainment at Key Stage 3. Other significant factors were related to **socio-economic** variables (young people with a high number of books in the home made more progress – 0.14 of a level – than other young people from the same backgrounds and with the same prior attainment), **pupil attitudes** (young people who found that the teaching strategies used in their school were helpful, who engaged in activities with pupils from other schools, who reported parental support with their homework and who had good self-reported attendance and punctuality records made more progress than other pupils – 0.13 of a level) and **ethnicity** (Bangladeshi pupils and girls from Chinese, Indian and Black Caribbean backgrounds made more progress than young people from other backgrounds). By contrast, young people with **special educational needs** (-0.29 of a level), those who had been **excluded** for at least one fixed term during the previous academic year (-0.16 of a level), those who had not been in the school from Year 7 (-0.10 of a level) and those in **low- or mid-performing** schools (-0.32 and -0.21 of a level, respectively) made less progress than other young people with the same prior attainment and background characteristics.

#### 4.4 In Summary

As suggested in the economic analyses conducted by Emmerson *et al.* (2005), it would appear that there are some statistically significant associations between Aimhigher: Excellence Challenge interventions and attainment for both the Year 9 and the Year 11 cohorts. These associations are most evident in relation to the gifted and talented and widening participation cohorts and, for Year 11, summer schools, university visits and discussions about higher education with family, friends, and representatives from higher education, including undergraduates.

## 5. POLICY IMPACT: ATTITUDES AND ASPIRATIONS

The findings summarised in Chapter 4 support the view that appears to be most widely shared by those who have been engaged in delivering Aimhigher: Excellence Challenge activities, that coordinated, on-going programmes and repeated activities may have a more significant impact on young people than one-off activities. Is there any indication that such programmes also have an impact on young people's attitudes to education or their aspirations towards higher education?

### 5.1 Attitudes and Aspirations: Year 11<sup>52</sup>

There was little statistical evidence from the cross-sectional analysis to suggest that Aimhigher: Excellence Challenge activities had yet played a major part in influencing young people's attitudes to pre- or post-16 education or to their (self-reported) behaviour in school. Such positive attitudes were more likely to be associated with members of the **gifted and talented cohort** than with other young people (an odds multiplier of 1.31) but there was no such association with being designated as a member of the widening participation cohort.

However, there was evidence to suggest that the **ethos** created by teachers in a school could have a significant impact on young people's attitudes. In particular, there were significant associations between young people's attitudes and behaviour and their belief that teachers treated pupils with respect; young people who reported such a view were more than one and a half times as likely (an odds multiplier of 1.62) as other young people to have a good attitude to education, to attend regularly and punctually and to complete their homework and course work assignments. Teachers' perceived willingness to listen to young people's views (an odds multiplier of 1.24), to encourage young people who were good at a subject (an odds multiplier of 1.29) and to help those who were finding things difficult (an odds multiplier of 1.28) were all associated with an increased likelihood that young people would have a positive attitude to their education and work.

**Appropriate curriculum provision**, in which the school was seen to provide a wide range of subjects (an odds multiplier of 1.51) and to equip young people with useful skills and knowledge (an odds multiplier of 1.41) were

<sup>52</sup> Tables 5 to 9 in Appendix 5.



similarly associated, as was the provision of facilities for young people to complete their homework (an odds multiplier of 1.26). The importance of **parental support**, in terms of ensuring the completion of homework (an odds multiplier of 1.46), praise (an odds multiplier of 1.51), valuing school (an odds multiplier of 1.22) and attending parents' evenings (an odds multiplier of 1.75) was also highlighted.

### 5.1.1 The impact of Aimhigher: Excellence Challenge: attitudes to higher education

The significance of these findings is highlighted when young people's aspirations to higher education are explored. The cross-sectional analysis indicated that, amongst respondents in Year 11, young people with a positive attitude to education were more likely than other young people (an odds multiplier of 1.38) to consider going to university, once all other background factors (including attainment at GCSE) had been taken into account. However, there were also clear indications that some of the strategies that have been implemented or enhanced under Aimhigher: Excellence Challenge were significantly associated with an intention to go to university. These included:

- ♦ Young people's schools making them think of the value of going to university (an odds multiplier of 1.84);
- ♦ Opportunities to discuss life at university with family (an odds multiplier of 1.63) or friends (an odds multiplier of 1.45);
- ♦ Opportunities to discuss life at university with undergraduates (an odds multiplier of 1.53).

For pupils in Year 9,<sup>53</sup> family background (such as level of parental education – an odds multiplier of 1.39 for fathers with a degree for example) and family attitudes to education (with young people more than twice as likely to have considered higher education if they believed their parents wanted them to stay in education for as long as possible) appeared paramount. However, there was evidence to suggest that some of the strategies adopted under the Aimhigher: Excellence Challenge initiative were significantly associated with the intentions of young people in Year 9 to aim for higher education in the future. These were less to do with particular events or activities or to designation to a particular cohort (although young people in the gifted and talented cohort were more than one a half times as likely as other young people to state an intention to go to university) than to the creation of an ethos in which young people were encouraged to think about going to higher education (an odds multiplier of 1.22) and the opportunity for **discussions with family and friends** and with **university staff and undergraduates** about higher education.

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<sup>53</sup> See Table 18 Appendix 5.

The question that arises, however, is whether young people in Years 9 and 11 took advantage of these opportunities because they had already decided to go to university, or whether the opportunities had led young people to reconsider their options. To what extent is it possible to determine whether such strategies simply reinforce pre-determined attitudes or whether they indeed have an impact on young people's subsequent decisions?

## 5.2 The Impact of Aimhigher: Excellence Challenge: Intentions to Progress to Higher Education

As outlined above, the cross-sectional models identified statistical associations between Aimhigher: Excellence Challenge related activities and young people's expressed intention to go to university. The longitudinal models explored the relationship that existed between such activities and young people's changes in aspirations between Year 10 and Year 11. Some 1055 young people who had not expressed an intention to go on to university when they were in Year 10 had changed their mind by the time they were in Year 11 and indicated that this was now their aspiration. A further 807 who had considered such an option had, by 2002/03, decided that this was not their preferred destination. The profile of these groups revealed that there were some differences between those who had changed their mind and decided to follow the higher education route and those who had not. Relatively, a higher proportion of those who decided to follow the higher education route:

- ◆ were female (58% of those choosing to go to university were female compared with 49% of the group who chose to abandon such plans)<sup>54</sup>
- ◆ were living with both parents (68% against 61%)
- ◆ were in high performing schools (8% against 3%)
- ◆ were members of the gifted and talented cohort in 2001/02 (12% compared with 8%) or 2002/03 (16% compared with 11%)
- ◆ had talked about life with university with their family (76% against 68%) or friends (63% against 54%) or undergraduates 39% against 33%.

There were no differences, however, in terms of membership of the widening participation cohort or whether or not young people had taken part in summer schools or visits to universities. Similar proportions of young people in the two groups were designated as part of the widening participation cohort (around seven per cent when they were in Year 10 and 10% when they were in Year 11), had taken part in summer schools (around 30% in either Year 10 and/or Year 11), had visited a university (around 25% in Year 10 and 36% in Year 11), or had talked to teachers, Personal Advisers, or university lecturers about higher education.

<sup>54</sup> All of the differences were significant at least  $p < 0.01$ .

The modelling process revealed that, for these 1,862 young people and once prior attainment had been taken into account, the key factors associated with a changed and positive decision to enter higher education were:<sup>55</sup>

- ♦ home background (young people living with both parents were more likely than other young people to have become more motivated towards undertaking a university course since Year 10)
- ♦ sex (girls were more likely than they had been in Year 10 to be considering a degree or equivalent course)
- ♦ speaking to family members about life at university.

Visits to a higher education institution during the academic year were highly related to positive decisions, but were not statistically significant at the 95% level. Young people in both high performing and low performing schools were associated with a greater chance of making a positive decision about higher education than those in mid-performing schools.

At this stage, therefore, it does not appear that the interventions that have been implemented under Aimhigher: Excellence Challenge for this group of young people have significantly influenced the decision-making process between Year 10 and Year 11 for this cohort. Future analysis for this evaluation will explore the decision-making process more fully, particularly in terms of longitudinal change from Year 9 to Year 11. It will also examine the role that may have been played by Aimhigher: Excellence Challenge activities in helping young people to maintain their motivation and aspirations towards higher education. However, while no clear links between policy-related interventions and changed decisions for this group of young people, the analysis has re-emphasised the importance of parental involvement in decision-making and has indicated that there is potential for leverage even amongst young people in low performing schools.

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<sup>55</sup> See Table 14 in Appendix 5.

## 6. CONCLUSION

Within one year of the implementation of Aimhigher: Excellence Challenge, it would appear that there are some significant statistical associations between policy-related interventions and young people's attainment and aspirations. These associations are by no means straightforward; while links can be seen between an aspiration towards higher education and Aimhigher: Excellence Challenge activities, the role played by such activities in actively changing young people's ambitions is less clear. However, it is encouraging to note the overlap between the activities that are perceived as effective by partnership coordinators, teachers and higher education staff – visits to universities (including summer schools) and the opportunity to talk to undergraduates – and the activities that have been identified as statistically significant in terms of attainment and aspirations.

Designation as part of the gifted and talented or widening participation cohort also appear to have been a significant factor in raising attainment and in promoting aspirations towards higher education. Given that, it will be important for the longer-term impact of the unified Aimhigher programme that there is equity in allocating young people to such groups and to related activities. To date, basic descriptive data suggests that there may be under-representation amongst some groups of young people. While there is no onus on partnerships to ensure that the gifted and talented or widening participation cohorts are fully representative of all young people in the area (the emphasis is more on identifying young people who would benefit from the interventions), there still be further work to be done at a local level to ensure that appropriate activities are available to all eligible young people.

The findings to date suggest that the most effective strategies in promoting higher attainment and increasing motivation are those that are part of an ongoing programme of events, expose young people to the realities of all aspects of university life, whether through visits or through discussions with current students. They also highlight the value of a supportive and encouraging ethos within schools in which an aspiration to higher education is seen as a possibility for a wide range of young people with ability and with a willingness to work. These findings support the early indications from the analyses of the data collected from older cohorts – those who would have been in Year 12 at the launch of the Aimhigher: Excellence Challenge initiative. For those students, visits to higher education institutions and a supportive and informative ethos within their school, pre-16, had been key to their attitudes and aspirations towards higher education, post-16.

The greatest challenge for the unified Aimhigher programme in the future, however, may be to reach out to parents and to involve them in activities that help them to understand, consider and promote higher education for their children. Parental support has been shown to be significant in relation to levels of attainment, while discussions with parents have been shown to be key in encouraging young people to consider a university education and was associated with young people changing their mind about whether or not to pursue such a path. For policy-makers and practitioners, the importance of finding ways in which family members can be engaged more actively in such educational decision-making has been emphasised by the findings from this research. To date, Aimhigher: Excellence Challenge partnerships have reported only limited success in reaching out to this target group, although there are signs that some, at least, have identified successful strategies that may support such work in the future.

## **Appendix 1**

### **Evaluation Strategy**



### Evaluation strategy

The evaluation involves a range of integrated quantitative and qualitative studies. The central aim of the evaluation is to explore the effectiveness of the Aimhigher: Excellence Challenge programme. To what extent has it raised aspirations and achievement amongst targeted 13-19 year olds? How, and in what ways, has it contributed to increasing and widening participation in higher education? The methods that have been deployed to address these questions include:

- ♦ **Large-scale surveys** of students and tutors in schools and further education sector institutions. These have been implemented in order to provide information about such factors as the activities that have been undertaken as part of the Aimhigher: Excellence Challenge programme and students' attitudes towards education. The information obtained from these surveys (combined with administrative data sources and the National Pupil Database – NPD) will also be used to examine the impact of Aimhigher: Excellence Challenge on attainment and progression. **Tables A1** and **A2** below provide the numbers of responses from young people in Year 9 and Year 11, in 2000/01 and 2002/03, for the treatment and comparison schools.

**Table A1: Responses, by year: from treatment and comparison schools Year 11**

	<b>2002</b>	<b>2003</b>	<b>Total</b>
In treatment schools (EiC Phase 1,2 EAZ)	5682	9265	14947
In comparison schools (Phase 3 EiC, non-EiC, non-EAZ schools)	794	4257	5051
	<b>6476</b>	<b>13522</b>	<b>19,998</b>

**Table A2: Responses, by year: from treatment and comparison schools Year 9**

	<b>2002</b>	<b>2003</b>	<b>Total</b>
In treatment schools (EiC Phase 1,2 EAZ)	7397	6383	13780
In comparison schools (Phase 3 EiC, non-EiC, non-EAZ schools)	1542	1794	3336
	<b>8939</b>	<b>8177</b>	<b>17116</b>

- ♦ **Surveys of higher education providers**, to collate information about activities aimed at widening participation and policies and practices in relation to access to higher education. The information from these surveys will also be used to assess the perceived effectiveness of such policies and practices.



- ♦ **Surveys of young people eligible for Opportunity Bursaries**, to ascertain their characteristics, financial circumstances and experiences.
- ♦ **Annual interviews with Aimhigher: Excellence Challenge coordinators** in partnerships. These interviews have sought to monitor the development of the initiative in the partnership areas and to gather perceptions about the effectiveness of the range and type of widening participation activities that have been implemented.
- ♦ **Area-based studies** of specific partnerships and higher education institutions to explore policy and practice at a local level and to contribute to an assessment of the perceived effectiveness of the first four strands of the programme.

## **Appendix 2**

### **Sample Representative Tables Year 9 and 11**



**Table 1. Characteristics of Schools Attended by Year 9 Pupils (2001/02), weighted by pupil numbers**

	<b>EC schools in sample</b> %	<b>ALL EC schools</b> %	<b>Comparison Schools</b> %	<b>All Schools</b> %
<b>Met-Non Met Area</b>				
Met	73	74	65	36
Non-Met	27	26	35	64
<b>Location</b>				
North	52	52	54	30
Midlands	19	19	39	33
South	29	29	8	37
<b>Percentage of pupils with English as an additional language</b>				
None	30	29	13	34
1 - 5%	36	28	41	41
6 - 49%	22	28	24	20
50% +	11	13	22	5
Not Applicable	1	2	0	1
<b>Percentage of pupils eligible for free school meals</b>				
Lowest 20%	0	1	0	6
2nd lowest 20%	6	6	11	25
Middle 20%	11	15	21	28
2nd highest 20%	37	31	23	24
Highest 20%	47	47	45	17
<b>KS3 Achievement Band</b>				
Lowest band	40	40	42	19
2nd lowest band	19	21	26	19
Middle band	25	19	19	19
2nd highest band	7	10	13	19
Highest band	9	9	0	18
Not Applicable	0	2	0	6
<b>GCSE Achievement Band</b>				
Lowest band	30	38	43	18
2nd lowest band	30	25	8	20
Middle band	18	17	31	20
2nd highest band	14	11	19	20
Highest band	7	7	0	15
Not Applicable	0	3	0	6
<b>Beacon School</b>				
No	87	88	92	91
Yes	13	12	8	9
<b>Specialist School</b>				
No	70	70	75	77
Yes	30	30	25	23
<b>Total number of schools</b>	<b>60</b>	<b>13</b>	<b>848</b>	<b>3598</b>

**Table 2. Characteristics of Schools Attended by Year 11 Pupils (2001/02), weighted by pupil numbers**

	<b>EC schools in sample</b> %	<b>ALL EC schools</b> %	<b>Comparison Schools</b> %	<b>All Schools</b> %
<b>Met-Non Met Area</b>				
Met	78	74	77	35
Non-Met	22	26	23	65
<b>Location</b>				
North	70	53	11	30
Midlands	18	19	89	33
South	13	28	0	37
<b>Percentage of pupils with English as an additional language</b>				
None	55	29	0	34
1 - 5%	22	28	0	41
6 - 49%	18	28	68	20
50% +	5	13	32	5
Not Applicable	0	2	0	1
<b>Percentage of pupils eligible for free school meals</b>				
Lowest 20%	0	1	11	6
2nd lowest 20%	8	6	0	26
Middle 20%	19	16	23	28
2nd highest 20%	42	31	34	24
Highest 20%	31	47	32	16
<b>KS3 Achievement Band</b>				
Lowest band	28	39	32	18
2nd lowest band	27	20	34	19
Middle band	19	19	23	19
2nd highest band	17	10	0	19
Highest band	9	10	11	18
Not Applicable	0	2	0	7
<b>GCSE Achievement Band</b>				
Lowest band	32	37	11	18
2nd lowest band	23	24	36	20
Middle band	22	17	41	20
2nd highest band	14	11	0	20
Highest band	9	7	11	15
Not Applicable	0	3	0	7
<b>Beacon School</b>				
No	89	88	79	91
Yes	11	12	21	9
<b>Specialist School</b>				
No	60	70	66	77
Yes	40	30	34	23
<b>Total number of schools</b>	<b>63</b>	<b>6</b>	<b>848</b>	<b>3598</b>

**Table 3. Characteristics of Schools Attended by Year 9 Pupils (2002/03), weighted by pupil numbers**

		Pupils					
		Responding pupils		Sample pupils		All pupils	
		Number	%	Number	%	Number	%
<b>Metropolitan</b>	Non-Metropolitan	3938	32	4638	19	366521	63
	Metropolitan	8262	68	19418	81	211631	37
<b>Region</b>	North	6431	53	12982	54	173504	30
	Midlands	2884	24	4328	18	187756	32
	South	2885	24	6746	28	216893	38
<b>% of EAL pupils (NOT-Quintiles)</b>	None	3601	30	5758	24	191994	33
	1 - 5%	4259	35	7195	30	237817	41
	6 - 49%	3064	25	8064	34	114948	20
	50% +	973	8	2268	9	27923	5
	Not available	303	2	771	3	5471	1
<b>% eligible FSM 2001 (5 pt scale)</b>	Lowest 20%	0	0	196	1	33202	6
	2nd lowest 20%	456	4	1464	6	148165	26
	Middle 20%	2239	18	3589	15	156252	27
	2nd highest 20%	3708	30	6015	25	140041	24
	Highest 20%	5797	48	12792	53	100014	17
Not available	0	0	0	0	479	0	
<b>Achievement Band (KS3 Overall performance)</b>	Lowest band	4478	37	9473	39	112070	19
	2nd lowest band	4056	33	5717	24	117013	20
	Middle band	1174	10	3368	14	116687	20
	2nd highest band	1364	11	2333	10	115043	20
	Highest band	1128	9	3165	13	109490	19
Not available	0	0	0	0	7849	1	
<b>Achievement Band (GCSE total point score)</b>	Lowest band	4811	39	9152	38	109468	19
	2nd lowest band	3880	32	6910	29	124059	21
	Middle band	1940	16	4090	17	122172	21
	2nd highest band	658	5	1454	6	121608	21
	Highest band	911	7	2298	10	90221	16
Not available	0	0	152	1	10625	2	
<b>Beacon School</b>	No	10263	84	19776	82	516760	89
	Yes	1937	16	4280	18	61392	11
<b>Specialist School</b>	No	7317	60	15891	66	376143	65
	Yes	4883	40	8165	34	202009	35
<b>Total pupils</b>		<b>12200</b>	<b>100</b>	<b>24056</b>	<b>100</b>	<b>578152</b>	<b>100</b>

**Table 4. Characteristics of Schools Attended by Year 11 Pupils (2002/03), weighted by pupil numbers**

		Pupils					
		Responding pupils		Sample pupils		All pupils	
		Number	%	Number	%	Number	%
<b>Metropolitan</b>	Non-Metropolitan	4398	34	4388	16	342153	63
	Metropolitan	8412	66	23466	84	200163	37
<b>Region</b>	North	6740	53	16456	59	165844	31
	Midlands	3361	26	5239	19	172986	32
	South	2709	21	6159	22	203486	38
<b>% of EAL pupils (NOT-Quintiles)</b>	None	4508	35	7566	27	179860	33
	1 - 5%	2757	22	7082	25	222864	41
	6 - 49%	3739	29	8723	31	107120	20
	50% +	1806	14	4011	14	26500	5
	Not available	0	0	472	2	5973	1
<b>% eligible FSM 2001 (5 pt scale)</b>	Lowest 20%	0	0	343	1	32498	6
	2nd lowest 20%	426	3	1362	5	138210	25
	Middle 20%	2382	19	4232	15	145865	27
	2nd highest 20%	4662	36	7854	28	131342	24
	Highest 20%	5340	42	14063	50	93923	17
	Not available	0	0	0	0	479	0
<b>Achievement Band (KS3 Overall performance)</b>	Lowest band	4417	34	10772	39	106158	20
	2nd lowest band	2989	23	5697	20	109024	20
	Middle band	2462	19	5302	19	108928	20
	2nd highest band	1735	14	3811	14	106631	20
	Highest band	1207	9	2272	8	102654	19
	Not available	0	0	0	0	8922	2
<b>Achievement Band (GCSE total point score)</b>	Lowest band	4335	34	10875	39	103491	19
	2nd lowest band	3969	31	7596	27	116213	21
	Middle band	2103	16	3751	13	117034	22
	2nd highest band	1665	13	4201	15	116563	21
	Highest band	738	6	1431	5	86301	16
	Not available	0	0	0	0	2714	1
<b>Beacon School</b>	No	11416	89	24371	87	484137	89
	Yes	1394	11	3483	13	58179	11
<b>Specialist School</b>	No	7075	55	17182	62	350231	65
	Yes	5735	45	10672	38	192086	35
<b>Total pupils</b>		<b>12810</b>	<b>100</b>	<b>27854</b>	<b>100</b>	<b>542316</b>	<b>100</b>

## **Appendix 3**

### **The multilevel modelling process**





### The multilevel modelling process

An exploration of the relative impact of Aimhigher: Excellence Challenge requires a systematic approach to the analysis of the available statistical data. In order to assess the ways in which, for example, young people's attitudes towards higher education are associated with the range of different policy-related and other inputs to which young people are exposed, a complex set of variables need to be examined. Young people in participating schools and colleges come from a variety of home and school backgrounds, have different academic abilities and have been exposed, to varying degrees, to a range of different educational experiences. All of these could be expected to have an impact on their awareness of and attitudes towards higher education, as well as on their aspirations to a university education.

Since the data to which the research team has access is hierarchical (variables can be identified at distinct levels – that of the partnership, the school and the student) the NFER team has adopted the use of a multilevel modelling approach to data analysis. In multilevel modelling, the process is begun by identifying an outcome variable (for example pupil attainment, attitudes or actions), then, for each level of the data, the background variables that might be thought to influence that outcome are defined. Regardless of the outcome variables that are selected, it is expected that there will be differences of outcome at each level:

- ◆ **individuals** will be different from each other;
- ◆ individuals within one **school** will be **collectively different** from those in other schools; and
- ◆ individuals within schools implementing a specific policy, initiative or activity will be **collectively different** from those in schools not implementing the policy initiative or activity.

These differences can be measured in terms of the extent to which each outcome variable is 'conditioned' by the background variables at each level. For example, the effect that being included in the widening participation cohort is having on any pupil can be assessed through comparing the mean observed difference in the attainment, attitudes or behaviour of that young person with the expected mean for all young people in the survey, taking into account the relevant background variables at school and pupil level (including prior attainment).

By analysing the data in this way, it is possible to see the overall effects of each of the variables and identify the variables which have a significant impact. However, it should be remembered that:

- ◆ no multi-level model is likely to include every possible variable. The background variables included in the models developed for the evaluation of Aimhigher: Excellence Challenge are:
  - those which are known from past and current research to be relevant to pupil outcomes;
  - those attitudinal variables that appear, from the EiC and Aimhigher: Excellence Challenge research, to be associated with different aspects of pupil behaviour and performance;
  - those which are specifically related to the policy area.
- ◆ the models do not identify causality in a definitive way, but simply indicate significant factors which appear to bear some relationship to the outcomes. For instance, in the evaluation of Aimhigher: Excellence Challenge, the self-reported behaviour and attitudes towards education of Year 11 pupils designated as gifted and talented were more positive than those expressed by other pupils with the same prior attainment score at key stage 3. However, it is not possible to ascertain whether these attitudes entirely pre-dated Aimhigher: Excellence Challenge (and may even have contributed to the designation of the young person as gifted and talented under EiC) or whether they had become more evident as a result of the activities in which they had taken part as a result of EiC and Aimhigher: Excellence Challenge.
- ◆ a multilevel model is only as good as our understanding of the educational processes at work in influencing young people's attitudes, aspiration and motivation.

In order to prepare the data for inclusion in the models, the items in the questionnaires needed to be reduced to a more manageable data set. Ideally, data needs to be either *dichotomous* (for example male or not male) or *continuous* (in which the variable can take any value over a given range). The data in the surveys had, therefore, to be manipulated in order to provide information that could be used in the models. This data manipulation has largely been accomplished through the use of factor analysis, although other scoring or pattern identification techniques have been used where more appropriate. Appendix 4 summarises the different composite scores and scales that have been developed for use in the models.

## **Glossary of terms**

### **Factor analysis**

The aim of factor analysis is to reduce a large set of interdependent variables to a smaller set (usually just one or two, but can be more) of derived variables or 'factors', whose relationships to the original variables are such as to reproduce the largest part of their inter-correlations in terms of the new factors. This technique enables 'factor 'scores' to be derived for each

individual in a survey, which can be studied in lieu of the original more complex set of variables.

### **Multilevel modelling**

Multilevel modelling is a development of **multiple regression techniques**. The latter studies the relationships between variables in terms of the dependency of a single variable (the dependent or **outcome variable**, which may be a factor score) on a set of other explanatory or **background variables**. In multilevel modelling, the assumption is made that the data is collected from a hierarchical system, with, for example, some data relating to individual students and some relating to schools. Random variations can occur at any of these levels (see notes on **standard error** and **residuals** below), and can be fitted in the model. The model can therefore study the relationships between outcome variables and background variables, taking into account any random variations that might occur at student or school level.

### **Variance**

A measure of the spread of values between different objects in the same data set. It is based on the squares of the differences between individual values and the overall mean, and is always greater than or equal to 0. A variance of 0 implies that all values are identical.

Multi-level models allow us to estimate variances at different levels. For example, the student level variance is a measure of the variability in outcomes between different students, and the school level variance measures the variability between the average outcomes for different schools. These variances are generally reduced by the addition of background variables for the model, which tend to ‘explain’ some of the variability.

### **Outcome variable**

A numerical measure of some desired educational outcome, computed for each individual being modelled. It is assumed to be single-valued and continuous. Thus student outcomes, such as attitudes to higher education, must be converted to a single-valued score for use in the model.

### **Background variable**

This is a numerical measure of some educational or social factor that is supposed to be influencing the outcome variable, either positively or negatively. A number of background variables may be included in the model, and may relate to students, schools or other levels. Background variables may either be continuous or dichotomous. An example of the latter is an ‘indicator’ variable which has the variable 1 if the individual or unit belongs to a particular group (Aimhigher: Excellence Challenge school) and 0 otherwise (non-Aimhigher: Excellence Challenge school).

### **Coefficient**

One of the results of the modelling process is a coefficient estimated to each background variable which measures the strength of its influence on the outcome variable. It should be regarded as the rate at which the outcome variable increases per unit increase in the background variable. Indicator variables have coefficients which measure the average difference between being in the given group versus belonging to the reference (control) group. Therefore a coefficient of 2.643 for sex indicates the average difference between boys and girls for the selected outcome variable.

### **Standard error**

Each coefficient or variance computed by the modelling process is an estimate of its corresponding 'true' value based on the data available, and is therefore liable to be in error. The model also computes a standard error for each estimated parameter which measures the amount by which it might be in error. As a rule of thumb, coefficients less than twice their standard error in absolute value are not regarded as significantly different from zero.

### **Residual**

The residual or error term in the model for an object at any level (for example, student or school) is the amount of the outcome variable which is not predicted by the overall mean or the background variables. In other words, it is what is 'left over' after the model has been fitted. Residuals sum to zero for objects at a given level, and tend to become smaller as more background variables are fitted.

## **Appendix 4**

### **Derivation of Composite Variables**



### Derivation of Composite Variables for Pupils

The following approach was used to derive composite scales from selected questions and items on the pupil questionnaire. Groups of items from the pupil questionnaires were used to create composite scales and factors for young people in Year 9 and Year 11:

- ◆ Young people's views of their teachers
- ◆ Young people's views of their school
- ◆ Young people's views of the facilities in their schools
- ◆ Young people's views of the help and support they received in school
- ◆ Young people's views of the school-run activities available to them in and out of school hours
- ◆ Young people's views of extent to which they had contact with students in other schools
- ◆ Young people's views of the degree of support they received from home
- ◆ Young people's comments on their parents' view of education
- ◆ Young people's views on higher education
- ◆ Self-reported attendance, punctuality and behaviour
- ◆ Self-reported study and key skills etc.
- ◆ Young people's views on preparation for the future (for Year 11 only).

It should be noted that certain questionnaire items did not lend themselves to factor analysis and were used to develop dichotomous variables that represent a pattern of activity (such as pupil has talked to educational professionals about higher education/pupil has not talked to educational professionals about higher education) rather than a factor score. These items were used in the models, but their detailed construction is not discussed here.

In each case, an appropriate strategy was adopted to deal with small quantities of missing data (generally, this meant recoding to the mean). Exploratory factor analysis was then used, where appropriate, to ascertain whether items related to one another. Questions or individual items with large quantities of missing data were omitted from the factor analysis.

Following rotation, items that appeared to relate closely (i.e., with a loading greater than at least 0.4) were grouped together as a scale. Scores for each scale were then calculated as a sum of the item responses. In general, items were scored so that positive or stronger responses were given higher values. The main exception to this rule was with the scale relating to the helpfulness of teaching strategies. Here a score of 2 was given if a pupil reported that they found teaching method helpful *and* was being taught in that way in at least a few subjects. A score of 1 was given if the young person found the method



helpful but was not being taught in that way in any subject. A score of zero was given if the pupil found the given method helpful, whether or not they were being taught in that way. In this way, more weight was given to the opinions of pupils who were expressing views about teaching methods they experienced.

These scales were then submitted to a test of reliability (Cronbach's alpha) to examine the extent to which the items which made up the scale were mutually correlated and hence measuring essentially the same construct. Values close to 1.0 are perfect, and values around 0 would imply no mutual relationship (note that the reliability index tends to increase with number of items in the scale). Second order factor analysis was then used to identify any groups of factors that related together. Scales based on these second order factors were used in the development of the multilevel models.

The first and second order factors that were derived for each year group are summarised in the following tables.

### **Factors and Derived Scales: Year 9**

Table A shows the attitude scales that were developed for Year 9 pupils, based on the first order factors. The table summarises the items on which they were based, the reliability indices of the scales and the scale ranges. Scales with a low level of reliability are italicised. Note that some of the negative items in the questionnaire have weighted negatively in the factor analysis and so appear as a positive scale (or vice versa). For example, the item for Question 11g, '*I find it very hard to talk to the class*', has weighted negatively and so, in the Scale HAPPY has emerged as '*I do not find it very hard to talk to the class*'.

**Table A: First order factors for Year 9**

Scale Name	Scale Items (based on questions in pupil questionnaire)	Description	Reliability of Scale	Scale range
CURRACT	Q3[a-c,e,g,m]	Curriculum-based activities	0.70	0 – 18
NONCURR	Q3[i,j]	Outdoor/Residential activity	0.58	0 - 6
LEARN1	Q3[d,f,h,k,l]	Visits, Homework clubs, Summer school	0.56	0 - 12
<i>LEARN2</i>	<i>Q1[b,c,d,e,f]</i>	<i>Teachers use range of teaching strategies</i>	<i>0.36</i>	<i>0 - 10</i>
TEACH	Q14 [g,k,l]	Pupils' positive view of teachers	0.59	0 - 6
ENJSCH	Q14 [a,b], Q15[b,c,d]	Schoolwork enjoyable and worthwhile	0.71	-12 - 4
GOODSCH1	Q14[c,i,j,m] Q15[e]	School has sensible rules, pupils respect teachers, teachers listen to pupils, provide interesting work and encourage HE aspirations	0.63	-2 - 6
GOODSCH2	Q14[d,e,f,h]	Everyone thinks it is a good school	0.61	1 – 19
GOODPUP	Q5[a,c],Q15[a]	Motivated pupil	0.68	0 - 8
FACIL	Q4[a-i]	School has good facilities	0.75	0 - 36
HELP	Q1[a2-f2]	Range of teaching strategies found helpful	0.72	0 - 12
WELL	Q2a,Q2b	Performance reviews and target setting in place	0.40	0 - 4
OUTSIDE1	Q3[a2-c2,i2-k2,m2]	Curriculum and outdoor activities with pupils from other schools	0.74	0 – 14
OUTSIDE2	Q3[d2-h2,l2]	Academic support and visits with pupils from other schools	0.65	0 - 19
SUPPORT	Q6[b1-b5]	Family helps with homework	0.59	0 - 5
ATTEND	Q9a,Q10a	Frequency of truancy or lateness	0.44	0 - 7
ANALY1	Q8[a-c,g-l]	Analytical, individual problem solver	0.60	0 - 12
ANALY2	Q8[d-f]	Prefers practical work, likes computers and wants more help with homework	0.44	0 - 6
PARINT	Q12[a-d]	Parental support for schoolwork	0.68	0 - 8

Scale Name	Scale Items (based on questions in pupil questionnaire)	Description	Reliability of Scale	Scale range
SAD	Q11[a,c,d,,f]	Lonely person, unhappy at home	0.23	-2 - 6
HAPPY	Q11[b,e,g,h]	Confident popular person	0.50	-2 - 6
NOUNI	Q16[c, f-h]	Not going to university for variety reason	0.46	0 - 8
STAYON	Q16[a,b,d,e]	Wants to stay on in education	0.43	-2 - 6

**Table B** summarises the second order factors. It should be noted that all of the first order factors derived for Year 9, including those with a lower level of individual reliability, appeared to relate with other first order factors. These have all been incorporated into the final composite scales.

**Table B: Second order factors for Year 9**

Name of scale	First order scales included in scale	Description of Scale	Scale range
<b>FF1</b>	LEARN2 TEACH GOODSCH1 GOODSCH2 FACIL WELL	Positive view of the nature of the school and the support it provides	0 - 74
<b>FF2</b>	ENJOYSCH GOODPUP PARINT (-) NOUNI STAYON	Positive pupil and parental view of education and aspires to university	-15 -26
<b>FF3</b>	CURRACT NONCURR LEARN1	High level of participation 1: Involved in range of extra-curricular curriculum-based and other activities and in range of visits, homework clubs and summer school	0 - 39
<b>FF4</b>	HELP OUTSIDE1 OUTSIDE2 SUPPORT ATTEND	High level of participation 2: Finds teaching strategies used helpful, engaged in activities with pupils from other schools, has parental support with homework and never truants or is late	0 - 46
<b>FF5</b>	ANALY1 ANALY2	Confident in range of learning modes	0 - 18
<b>FF6</b>	HAPPY (-) SAD	Popular, confident, happy at home	-8 - 8

### Factors and Derived Scales: Year 11

**Table C** and **Table D** relate to the first and second order factors derived for Year 11. There is a clear level of overlap with many of the first order factors that emerged for the younger cohorts, although some new factors, in addition to those that would have been expected (FUTURE, UNI), have emerged. These include new factors related to the teaching strategies deployed by teachers, pupils' views of their schools' facilities, the range of activities undertaken with pupils from other schools, preferred learning styles and confidence in using different skills and pupils' attitudes towards studying and work. One factor evident in the Year 9 analysis, indicating the extent of family assistance with homework (SUPPORT1), did not emerge as a distinct factor amongst the older cohort. The level of reliability of the various indices was by and large the same, although some (SAD, GOODSCH1, WELL) were notably higher.

**Table C: First order factors for Year 11**

Scale Name	Scale Items	Description	Reliability of Scale	Scale range
CURRACT	Q3[a-c,g,k]	Curriculum-based activities	0.62	0 - 18
NONCURR	Q3[d,f,h,i,j]	Extension/ visit-based activity	0.62	0 - 6
<i>LEARN1</i>	<i>Q1[b,d,] Q3b1</i>	<i>Teaching strategies include small groups, drama arts</i>	<i>0.26</i>	<i>0 - 7</i>
<i>LEARN2</i>	<i>Q1[c,e]</i>	<i>Teaching strategies include ICT and visitors from industry</i>	<i>0.22</i>	<i>0 - 4</i>
<i>LEARN3</i>	<i>Q1[a,f]</i>	<i>Teaching strategies include whole class teaching and questioning approaches</i>	<i>0.23</i>	<i>0 - 4</i>
TEACH	Q14[g,k,l]	Pupils' positive view of teachers	0.57	0 - 6
ENJSCH	Q14[a,b] Q15[b,c,d]	Schoolwork enjoyable and worthwhile	0.73	-12 - 4
GOODSCH1	Q14[d,e,h]	Every one thinks it is a good school	0.80	0 - 6
GOODSCH2	Q14[c,i,j],Q15[e ]	School has sensible rules, pupils respect teachers, teachers listen to pupils, provide interesting work	0.60	0 - 10
GOODPUP	Q5[a,c],Q15[a]	Motivated pupil	0.65	0 - 8
FACIL1	Q4[b,c,f-i]	School has good facilities - not arts	0.68	0 - 24
FACIL2	Q[d,e]	Good facilities for arts	0.61	0 - 8

Scale Name	Scale Items	Description	Reliability of Scale	Scale range
FUTURE	Q18[a-d],Q20	School gives good preparation for future	0.71	0 - 10
HELP	Q1[a2,b2,c2,d2,e2,f2]	Range of teaching strategies found helpful	0.66	0 - 12
UNI	Q18, Q14m	Encouraged to think about university	0.66	0 - 4
WELL	Q2[a,b]	Performance reviews and target setting in place	0.51	0 - 4
OUTSIDE1	Q3[d2,e2,g2,j2]	Curriculum activities with students from other schools	0.60	0 - 12 0 - 4
OUTSIDE2	Q3[f2,h2,i2]	Activities with students from other schools-visits and summer schools	0.59	0 - 9 0 - 3
OUTSIDE3	Q3[a2,c2,k2]	Activities with students from other schools-sports and IT	0.52	0 - 7 0 - 3
ATTEND	Q9a, Q10a	Frequency of truancy or lateness	0.47	0 - 7
PLANNER	Q8[d,h,i]	Good at organising and setting targets	0.54	0 - 6
ANALYSIS	Q8[a,b,f,j]	Analytical, individual problem solver	0.48	0 - 8
<i>TEAMPLAY</i>	<i>Q8[c,e,g]</i>	<i>Enjoys team work and practical work and wants more help with homework</i>	<i>0.27</i>	<i>0 - 6</i>
PARINT	Q12[a-d]	Parental interest in school	0.70	0 - 8
HAPPY	Q11[b,e,g,h,]	Confident popular person	0.54	-2 - 6
SAD	Q11[a,c,f,d]	Lonely person unhappy at home	0.59	-2 - 6
STAYON	Q16[a,b,i,c]	Wants to stay on education	0.60	-2 - 6
NOUNI	Q16[d,f,j,k,l]	Not going to university for variety of reasons	0.51	0 - 10
<i>FUTOTH</i>	<i>Q16[e,g,h]</i>	<i>Wants to be treated as adult, sees no point in studying, sees need for computer for work</i>	<i>0.13</i>	<i>0 - 8</i>

**Table D** outlines the second order factors that were derived for Year 11. It should be noted that three first order factors (ENJSCH, WELL, PARINT) did

not load with any of the other factors. Since each of these first order factors appears to be internally reliable (and each loaded with other related factors in Year 9) it is likely that they will be included as separate factors in future modelling.

**Table D: Second Order Factors for Year and 11**

Name of scale	First order scales included in scale	Description of Scale	Scale range
FAC1	<i>LEARN3</i> TEACH GOODSCH1 GOODSCH2 FACIL FACIL2 FUTURE UNI CHANCES	Positive view of supportive nature of school and the range of activities it provides including those related to performance review and preparation for the future (including HE)	1 - 76
FAC2	LIKESCH GOODPUP ATTEND STAYON	Positive attitudes to school and education (including post-16) and well-behaved pupil	-13 – 24
FAC3	PLANNER ANALYSIS HAPPY (-) SAD (-) NOUNI	Independent, confident learner	-11 – 20
FAC4	HELP OUTSIDE1 OUTSIDE2 OUTSIDE3	Finds teaching strategies helpful and engaged with pupils in other schools in wide variety of activities.	0 – 28
FAC5	CURRACT NONCURR <i>LEARN1</i> <i>LEARN2</i>  <i>TEAMPLAY</i>	Involved in wide range of learning activities and enjoys team work.	0 – 43

### **Derivation of Composite Variables for Teachers**

The methodology used to derive the composite scales for teachers reflected that outlined for the pupils. The following groups of items were drawn on to create composite scales and factors:

- ◆ Views on the school community
- ◆ Views on parental involvement and interest in pupils' education
- ◆ Views on local/regional partnerships/networks (including perceived impact of Aimhigher: Excellence Challenge and EiC etc.)
- ◆ Attitudes towards the effectiveness etc. of the school
- ◆ Views on aspects of Aimhigher: Excellence Challenge (including perceived impact)
- ◆ Teaching experience and strategies used, including changes introduced as a result of Aimhigher: Excellence Challenge/other related policies.

The creation of the factor scales followed the same strategy as that adopted for the pupil survey. However, it should be noted that the variables related specifically to Aimhigher: Excellence Challenge could not be included in the development of the first and second-order factor scales, since these would not be common to the comparison schools. Instead, a range of initiative-related separate scales were derived specifically for the Aimhigher: Excellence Challenge schools. These were used in any analysis that pertained solely to the treatment schools (Phase 1 and 2 EiC and EAZ schools).

Table E shows the teacher attitude scales that were developed based on the derived factors. It summarises the items on which they were based, their scale range and their reliability indices.

**Table E: Attitude Scales for Tutor Survey**

Scale Name	Scale items	Description	Scale range	Reliability of Scale
TUTORGR1	Q1[a,b,c,d,e,h]	Views on pupil aspirations and self-esteem	0 - 12	0.85
TUTORGR2	Q1[f,g]	Views on pupil behaviour	0 - 4	0.67
PARENT1	Q2[b,d,e,f,h]	Views on active parental support	0 - 10	0.73
<i>PARENT2</i>	<i>Q2[a,c,g]</i>	<i>Views on parental interest</i>	<i>0 - 6</i>	<i>0.37</i>
<i>TEACH1</i>	<i>Q3[b]-Q3[a]</i>	<i>Teach the class in groups rather than all together</i>	<i>-3 - 3</i>	<i>0.39</i>
TEACH2	Q3[e,f]	Uses visitors from industry/business/HEIs	0 - 6	0.66
TEACH3	Q6[a_1,a_2,a_3 a_4]	Engagement in out-of-hours learning activities	0 - 4	0.46
TEACH4	Q7 [d,e,f]	Out-of hours activity detrimental effect on workload and other work	0 - 6	0.53
TEACH5	Q7[a,b,c]	Out-of hours activity had positive impact on teaching	0 - 6	0.45
FACIL1	Q8[a,b,c,d,e,g,h]	Good facilities (scale does not include library and technology)	5 - 28	0.68
FACIL2	Q8[f,i]	Good facilities (library and technology)	0 - 8	0.41
PROFDEV1	Q9[a,b,c]	Helpful CPD in ICT	0 - 6	0.55
PRODEV2	Q9[d,e,f,g]	Helpful CPD in strategies for working with different groups of pupils	0 - 8	0.61
PRODEV3	Q9[h,i,j,k,l]	Helpful CPD in personal/professional development	0 - 10	0.57
PUBLIC1	Q11[a,b,d,h]	Perceived strengths related to performance, behaviour, quality of teaching and support for able pupils	0 - 8	0.72
PUBLIC2	Q11[i,j,k,l]	Perceived strengths related to sports, arts facilities	0 - 8	0.64
PUBLIC3	Q11[m,n,o]	Perceived strengths related to ICT and technology facilities	0 - 6	0.65



Scale Name	Scale items	Description	Scale range	Reliability of Scale
PUBLIC4	Q3[c,e,f,g]	Perceived strengths related to leadership, support for less able, ethos and welcome for different ethnic groups	0 - 8	0.48
IMPSCH1	Q15[g,h,i,j,k]	Students have benefited from external visits and contacts (HE, business etc.)	0 - 15	0.78
IMPSCH2	Q15[c,d,e,f]	Students have benefited from more adult/teacher support	0 - 12	0.72
IMPSCH3	Q15[a,b]	Students have benefited from access to Beacon/Specialist schools	0 - 6	0.53
BENEFIT1	Q16[a1,a2,a6,a11,a12,a13,a14,a15]	Students who have benefited most = high and average performers, C/D borderline, Years 7 to 11	0 - 32	0.89
BENEFIT2	Q16[a3,a4,a5]	Students who have benefited most = low attainers	0 - 12	0.87
BENEFIT3	Q16[a7,a8]	Students who have benefited most = disaffected, disruptive	0 - 8	0.88
BENEFIT4	Q16[a9,a10]	Students who have benefited most = from minority ethnic groups and socially/economically disadvantaged	0 - 8	0.65
LELINK1	Q18[a,b,e,f,g,h]	Good relationships with local maintained schools, LEA, FE and HE	0 - 24	0.85
LELINK2	Q19[a,b,d,e]	Relations improved with local maintained schools and LEA	0 - 8	0.58
LELINK3	Q19[f,g,h,i]	Relations improved with parents/carers, business/industry, FE, HE	0 - 8	0.60

As in the pupil survey, a series of second-order factors were then derived from these first-order scales and these are summarised in Table F

**Table F: Second order composites for the teachers survey**

Scale Name	Scale items	Description	Scale range	Reliability of Scale
FAC1TUT	IMPSCH2, BENEFIT1, BENEFIT2, BENEFIT3, BENEFIT4	Complete range of students have benefited from more adult/teacher support	0 - 72	0.68
FAC2TUT	TUTORGR1, TUTORGR2, PARENT1, PARENT2, PUBLIC1	Positive views re pupil aspirations, behaviour, active parental support and interest and on public perceptions of schools academic strength etc.	2 - 40	0.72
FAC3TUT	FACIL1, FACIL2, PUBLIC2, PUBLIC3	Positive views on school facilities and public perceptions of strengths in curriculum and extra-curricular areas	9 - 50	0.66
FAC4TUT	PRODEV1, PROFDEV2, PROFDEV3, IMPSCH1, LELINK2, LELINK3	Helpful CPD in range of areas, pupils have benefited from visits and relationships have improved with maintained sector, LEA, parents/carers, business community, FE and HE	8 - 53	0.59
<i>FAC5TUT</i>	<i>TEACH2, TEACH3, TEACH4, LELINK1</i>	<i>Wide range of visitors and activities, good relationships, but workload increasing and other areas of work suffering</i>	<i>1 - 36</i>	<i>0.22</i>

TEACH1, TEACH5, PUBLIC4 and IMPSCH3 did not load with any other factors. Of the second order scales, FAC5TUT had a very low level of reliability and the individual scales were used in the models instead of the second-order scale.

Additional composite and single variables were obtained from the teacher survey for inclusion in the models. These included:

- ◆ Background variables about the teachers (sex, ethnicity, level of seniority/responsibility and years in teaching etc.).
- ◆ Items derived from those questions related specifically to the policy.

### Derivation of Composite Variables for Schools

Given the nature of the school questionnaire, the use of factor analysis was not appropriate for the construction of composite scales. It was used in only one instance to help identify particular associations of activity, rather than to derive a factor scale *per se* (see Table G below). The derivation of the grouped data from the questionnaire focused more on the calculation of *values* (such as mean number of activities provided) or *patterns* (distribution of activities by year group).

**Table G: Strategies used to promote higher education**

Name	Description	Range	Frequency distribution
HE1 (sum of)	Tailored teaching programme for Year 9 Family learning events Activities run by Connexions Externally produced promotional materials	0 – 4	0 = 8% 1 = 29% 2 = 37% 3 = 20% 4 = 7%
HE2 (sum of)	Summer schools (may also be used as a single variable in some models – 243 schools – 79% - offered these) Out-of-hours study support	0 – 2	0 = 11% 1 = 33% 2 = 56%
HE3 (sum of)	Use of undergraduate mentors Other strategies	0 – 2	0 = 48% 1 = 41% 2 = 11%
HE4 (sum of)	AEA masterclasses Invited speakers	0 – 2	0 = 18% 1 = 75% 2 = 7%

The multilevel models of pupil outcomes included school data obtained from a number of sources:

- ♦ **Background data** from the **Register of Schools (ROS)**. This included data on location, size, age range, management type (Foundation, maintained, voluntary aided etc.), school type (grammar, comprehensive, modern etc.), aggregated profiles of SEN, Free School Meal eligibility, attainment profile etc.
- ♦ **Policy specific data** (e.g. Phase of EiC, EAZ schools, designation as Beacon or Specialist etc.)
- ♦ Information from the school **questionnaire**. This included items on:
  - The strategies deployed to promote higher education to young people and their families and the propositions of young people progressing to FE and HE;
  - The range of out-of hours learning activities provided (and, for Challenge schools, the extent to which these were perceived as being introduced or extended by Aimhigher: Excellence Challenge);
  - The range of work-related activities provided (by year group);

- The sources of additional (non-DfES) funding obtained by schools (mean, range and total number of sources);
- Staffing and pupil management structures within schools (dominant pupil grouping, staff training, etc.);
- Specific Aimhigher: Excellence Challenge related variables to do with funding and staffing.

It should be noted that the school level data compiled for the comparative multilevel modelling analysis for Aimhigher: Excellence Challenge could only include that which was common to all Aimhigher: Excellence Challenge and comparison schools.

The following tables provide a key to the full list of variables included in the analyses. Note that the list for the Year 9 variables provides only those variables that differ from those included in the Year 11 analysis.



## **Appendix 5**

### **Cross-sectional and longitudinal tables – Year 9 and 11**



## List of variables – Year 11

Variable Name	Variable Label
PUPILID	Unique pupil ID
LEA	LEA
SCHOOL	School
	<b>Second order composites created using first order composites (Pupil questionnaire)</b>
FAC1Y11	learn3+teach1+goodsch+goodsch2+facil1+facil2+future+uni+chances
FAC2Y11	likesch1+goodpup+truant+stayon
FAC3Y11	planner+analysis+happy-sad-nouni
FAC4Y11	help+outside1+outside2+outside3
FAC5Y11	curract+noncurr+learn1+learn2+teamman
LIVEMF	Live with mum and dad
MOTONLY	Live with mother only
FATONLY	Live with father only
PHASE1	EIC Phase 1
PHASE2	EIC Phase 2
COMP	Comparison Group
PHASE12	EIC Phase 1 & 2
BOOKS	Number of books in home
MSECOND	Mother's highest education was secondary
MPOST16	Mother's highest education was FE
MDEGREE	Mother's highest education was HE
MMISSING	Missing mother's education
FSECOND	Father's highest education was secondary
FPOST16	Father's highest education was FE
FDEGREE	Father's highest education was HE
FMISSING	Missing father's education
EAZ	EAZ School
	<b>Second order composites created using first order composites (Tutor questionnaire)</b>
FAC1TU_1	impsch2+benefit1+benefit2+benefit3+benefit4.
FAC2TU_1	tutorgr1+tutorgr2+parent1+parent2+public1.
FAC3TU_1	facil1+facil2+public2+public3
FAC4TU_1	profdev1+profdev2+profdev3+impsch1+lalink2+lalink3.
FAC5TU_1	teach2+teach3+teach4+lalink1.
Q12A_1	How important is it that all students have access to opportunities beyond school
Q12B_1	How important is it that every school has a distinct teaching and learning programme
Q12C_1	How important is it that all local schools work together
Q12D_1	How important is it that a wide range of students are encouraged to go into HE
Q13B1_1	Aimhigher will encourage a wider range of children to go into HE
Q13B2_1	Opportunity bursaries will help young people from this school
Q13B3_1	Aimhigher advertising will influence more families
GAWARE	Awareness of Aimhigher in general
SAWARE	Awareness of Aimhigher in your school
BOYSCH	Boys School
GIRLSCH	Girls School
MIXSCH	Mixed School
LCOM	Local Community School
LFOU	Local Foundation School
LVA	Local VA School



Variable Name	Variable Label
LVC	Local VC School
BEACON	Beacon School
LITERACY	School offered Literacy activities
NUMERACY	School offered Numeracy activities
Q2	Percentage of Y11 students going on to FE
Q15YES	Involved with a Beacon school
Q7TOT	Number of activities involving the local community
Q12TOT	Total income from non LEA and DfES sources
Q14BTOT	Number of activities offered as a result of Aimhigher
NUMBQ14	Number of activities offered
Q4FAC1	Number of strategies to promote HE (items 1, 7, 9 and 10)
Q4FAC2	Number of strategies to promote HE (items 2 and 6)
Q4FAC3	Number of strategies to promote HE (items 5 and 13)
Q4FAC4	Number of strategies to promote HE (items 4 and 8)
SUMMER	School offered summer schools
MODEK3SE	Grouping arrangements KS3
MODEK4SE	Grouping arrangements KS4
FSMYES	Free School Meal
TOTSCORE	Total GCSE Score
TOTSC8	Capped GCSE Score
GCSEAVSC	Average GCSE Score
GCSEENG	English GCSE Score
GCSEMATH	Maths GCSE Score
TOTATOC	Total A to C Grades
TOTATOG	Total A to G Grades
TOTASTAR	Total Grades A Star
KS3ENG	KS3 English Level
KS3MATH	Ks3 Maths Level
KS3SC	KS3 Science Level
KS3AV	KS3 Average Level
KS2ENG	KS2 English Level
KS2MATH	KS2 Maths Level
KS2SC	KS2 Science Level
KS2AV	KS2 Average Level
GNT	Gifted & Talented
GNTMIS	Missing G&T
EXCLFYES	Excluded fixed or permanent
EXCLFMIS	Missing exclusions data
MOB1	Mobile pupil
MOB2	Missing mobility data
EALYES	English as an additional language
EALMIS	Missing EAL data
SENYES	Special Educational Needs (stage 1,2,3,4&5)
SENMIS	Missing SEN
PCFSM00	School level FSM eligibility
LOW	Low performing school
MID	Mid performing school
HIGH	High performing school
NTHEAST	Nort East
NTHWEST	Nort West
YORKSH	Yorkshire
EASTMID	East Midlands

<b>Variable Name</b>	<b>Variable Label</b>
WESTMID	West Midlands
EAST	East
LONDON	London
SEAST	South East
SWEST	South West
WIDEPYES	Widening participation cohort
WIDEMISS	Missing WP data
MENTYES	Seen a learning mentor
MENTMISS	Missing mentor data
WHITEUK	White UK
WHITEEU	White European
WHITEOTH	White Other
CARIB	Black Caribbean
AFRICAN	Black African
BLACKOTH	Black Other
INDIAN	Indian
PAKISTAN	Pakistani
BANGLA	Bangladeshi
CHINESE	Chinese
OTHER	Other ethnicity
CONS	Constant
FSMMIS	Missing FSM data
YEARGP	Year of collection
FIVEPLUS	Five Plus A to C Grades
ENGFL12	English fluency Level 1 and 2
ENGFLUC	English fluency level 3
ENGFLUFU	English fluency level 4
ENGFLUFL	Native English speaker
FLUMISS	Missing fluency
SEXYES	Boy or Girl
SEXMISS	Missing sex
<b>The following are interaction terms</b>	
KS3AVLOW	Average KS3 level * Low performing school
KS3AVMID	Average KS3 level * Mid performing school
KS3AVHIG	Average KS3 level * High performing school
KS3CARIB	Average KS3 level * Black Caribbean
KS3INDI	Average KS3 level * Indian
KS3BANG	Average KS3 level * Bangladeshi
KS3PAK	Average KS3 level * Pakistani
KS3CHINE	Average KS3 level * Chinese
KS3AFRIC	Average KS3 level * African
MENTHIGH	Seen a learning mentor * High performing school
MENTLOW	Seen a learning mentor * Low performing school
MENTMID	Seen a learning mentor * Mid performing school
GNTLOW	Gifted & Talented * Low performing school
GNTMID	Gifted & Talented * Mid performing school
GNTHIGH	Gifted & Talented * High performing school
WIDELOW	Widening Participation * Low performing school
WIDEMID	Widening Participation * Mid performing school
WIDEHIGH	Widening Participation * High performing school
KS3GNT	Average KS3 Level * Gifted & Talented
KS3SEX	Average KS3 Level * Sex

<b>Variable Name</b>	<b>Variable Label</b>
KS3WIDE	Average KS3 Level * Widening Participation
KS3FLU12	Average KS3 Level * Fluency level 1&2
KS3FLU3	Average KS3 Level * Fluency level 3
KS3FLUF4	Average KS3 Level * Fluency level 4
KS3FLUF5	Average KS3 Level * Native English speaker
WIDEMENT	Widening Participation * Seen a learning mentor
KS3AVC	Average KS3 Level (centred)
GNTMENT	Gifted & Talented * Seen a learning mentor
CARIBSEX	Black Caribbean * Sex
AFRSEX	Black African * Sex
INDSEX	Indian * Sex
BANGSEX	Bangladeshi * Sex
CHINSEX	Chinese * Sex
CFDEG	Black Caribbean * Father's highest education was HE
CMDEG	Black Caribbean * Mother's highest education was HE
CFSECOND	Black Caribbean * Father's highest education was secondary
CMSECOND	Black Caribbean * Mother's highest education was secondary
CFPOST16	Black Caribbean * Father's highest education was FE
CMPOST16	Black Caribbean * Mother's highest education was FE
AFDEG	Black African * Father's highest education was HE
AMDEG	Black African * Mother's highest education was HE
AFSECOND	Black African * Father's highest education was secondary
AMSECOND	Black African * Mother's highest education was secondary
AFPOST16	Black African * Father's highest education was FE
AMPOST16	Black African * Mother's highest education was FE
BFDEG	Bangladeshi * Father's highest education was HE
BMDEG	Bangladeshi * Mother's highest education was HE
BFSECOND	Bangladeshi * Father's highest education was secondary
BMSECOND	Bangladeshi * Mother's highest education was secondary
BFPOST16	Bangladeshi * Father's highest education was FE
BMPOST16	Bangladeshi * Mother's highest education was FE
PFDEG	Pakistani * Father's highest education was HE
PMDEG	Pakistani * Mother's highest education was HE
PFSECOND	Pakistani * Father's highest education was secondary
PMSECOND	Pakistani * Mother's highest education was secondary
PFPOST16	Pakistani * Father's highest education was FE
PMPOST16	Pakistani * Mother's highest education was FE
CHFDEG	Chinese * Father's highest education was HE
CHMDEG	Chinese * Mother's highest education was HE
CHFSECON	Chinese * Father's highest education was secondary
CHMSECON	Chinese * Mother's highest education was secondary
CHFPOST	Chinese * Father's highest education was FE
CHMPOST	Chinese * Mother's highest education was FE
IFDEG	Indian * Father's highest education was HE
IMDEG	Indian * Mother's highest education was HE
IFSECON	Indian * Father's highest education was secondary
IMSECON	Indian * Mother's highest education was secondary
IFPOST	Indian * Father's highest education was FE
IMPOST	Indian * Mother's highest education was FE
CARIBGNT	Black Caribbean * Gifted & Talented
AFRGNT	Black African * Gifted & Talented
INDGNT	Indian * Gifted & Talented

<b>Variable Name</b>	<b>Variable Label</b>
BANGGNT	Bangladeshi * Gifted & Talented
CHINGNT	Chinese * Gifted & Talented
CARMENT	Black Caribbean * Seen a learning mentor
AFRMENT	Black African * Seen a learning mentor
INDMENT	Indian * Seen a learning mentor
BANGMENT	Bangladeshi * Seen a learning mentor
CHINMENT	Chinese * Seen a learning mentor
CARWIDE	Black Caribbean * Widening participation
AFRWIDE	Black African * Widening participation
INDWIDE	Indian * Widening participation
BANGWIDE	Bangladeshi * Widening participation
CHINWIDE	Chinese * Widening participation
LOWSEX	Low performing school * Sex
MIDSEX	Mid performing school * Sex
HIGHSEX	High performing school * Sex
GNTSEX	Gifted & talented * Sex
WIDEXSEX	Widening participation * Sex
YEARFF1	Year * FF1
YEARFF2	Year * FF2
YEARFF3	Year * FF3
YEARFF4	Year * FF4
YEARFF5	Year * FF5
YEARPH1	Year * Phase 1
YEARPH2	Year * Phase 2
YEARCOMP	Year * Comparison group
YEARPH12	Year * Phase 1&2
YEAREAZ	Year * EAZ School
SEXFF1	Sex * FF1
SEXFF2	Sex * FF2
SEXFF3	Sex * FF3
SEXFF4	Sex * FF4
SEXFF5	Sex * FF5
YEARMENT	Year * Seen a learning mentor
YEARGNT	Year * Gifted & Talented
YEARLOW	Year * Low performing school
YEARMID	Year * Mid performing school
YEARHIGH	Year * High performing school
KS3YEAR	Average KS3 level * Year
WIDEXYEAR	Widening participation * Year
CHALLENG	Phase 1, Phase 2 & EAZ

### List of variables – Year 9

Variable Name	Variable Label
	<b>Second order composites created using first order composites (Pupil questionnaire)</b>
FAC1Y9	learn2+teach1+goodsch1+goodsch2+facil1+well1
FAC2Y9	enjsch1+goodpup-nouni+stayon
FAC3Y9	curract+noncurr+learn1
FAC4Y9	help1+act1+act2+support1+attend1
FAC5Y9	analy1+analy2
FAC6Y9	happy-lonely
Q3SUMMER	Have been on a summer school
Q3VISUNI	Have been on an HE visit
Q18FAM	Talked about university with friends and family
Q18TUT	Talked about university with teachers and careers advisor
Q18UNI	Talked about university with university students/lecturers
KS2AVLOW	Average KS2 level * Low performing school
KS2AVMID	Average KS2 level * Mid performing school
KS2AVHIG	Average KS2 level * High performing school
KS2CARIB	Average KS2 level * Black Caribbean
KS2INDI	Average KS2 level * Indian
KS2BANG	Average KS2 level * Bangladeshi
KS2PAK	Average KS2 level * Pakistani
KS2CHINE	Average KS2 level * Chinese
KS2AFRIC	Average KS2 level * African
KS2GNT	Average KS2 Level * Gifted & Talented
KS2SEX	Average KS2 Level * Sex
KS2WIDE	Average KS2 Level * Widening Participation
KS2FLU12	Average KS2 Level * Fluency level 1&2
KS2FLU3	Average KS2 Level * Fluency level 3
KS2FLUF4	Average KS2 Level * Fluency level 4
KS2FLUF5	Average KS2 Level * Native English speaker
KS2YEAR	Average KS2 level * Year

**Table 1. Cross-sectional – Total GCSE score (Year 11)**

Total score		Multilevel results						
Parameter	Estimate	Standard error	Sig.	95% Confidence interval				
				Min.	Max.	Lower	Mean	Upper
<b>Base case</b>								
LEA variance	3.099	8.501		-13.563	19.761			
School variance	59.114	10.981	*	37.591	80.637			
Pupil variance	278.321	2.934	*	272.570	284.072			
<b>Final model</b>								
School variance	72.781	10.490	*	52.221	93.341			
School KS3 covar.	-15.375	2.267	*	-19.818	-10.932			
School KS3 variance	3.728	0.520	*	2.709	4.747			
Pupil variance	69.411	0.743	*	67.955	70.867			
<b>Fixed coefficients</b>								
CONS	-36.911	2.410	*	-41.635	-32.187			
KS3AV	11.674	0.230	*	11.223	12.125		18.52	19.24
FAC2Y11	0.616	0.016	*	0.585	0.647	4.50	4.74	4.98
FAC4Y11	0.164	0.026	*	0.113	0.215	0.44	0.63	0.83
LIVEMF	1.518	0.224	*	1.079	1.957	1.08	1.52	1.96
MOTHONLY	0.528	0.237	*	0.063	0.993	0.06	0.53	0.99
BOOKS	0.410	0.049	*	0.314	0.506	#VALUE!	0.26	0.32
MSECOND	0.452	0.166	*	0.127	0.777	0.13	0.45	0.78
MPOST16	0.448	0.207	*	0.042	0.854	0.04	0.45	0.85
MDEGREE	1.056	0.261	*	0.544	1.568	0.54	1.06	1.57
FDEGREE	0.917	0.217	*	0.492	1.342	0.49	0.92	1.34
FPOST16	0.578	0.189	*	0.208	0.948	0.21	0.58	0.95
FAC1TU_1	0.135	0.044	*	0.049	0.221	0.44	1.21	1.98
FAC2TU_1	0.119	0.047	*	0.027	0.211	0.22	0.99	1.76
Q12D_1	1.311	0.528	*	0.276	2.346	0.20	0.96	1.71
Q13B1_1	-1.859	0.711	*	-3.253	-0.465	-1.83	-1.04	-0.26
FSMYES	-1.947	0.178	*	-2.296	-1.598	-2.30	-1.95	-1.60
GNT	4.418	0.317	*	3.797	5.039	3.80	4.42	5.04
SEXYES	2.593	0.140	*	2.319	2.867	2.32	2.59	2.87
EXCLFYES	-3.712	0.366	*	-4.429	-2.995	-4.43	-3.71	-2.99
MOB1	-1.294	0.258	*	-1.800	-0.788	-1.80	-1.29	-0.79
EALYES	3.215	0.295	*	2.637	3.793	2.64	3.22	3.79
SENYES	-2.383	0.207	*	-2.789	-1.977	-2.79	-2.38	-1.98
WIDEPYES	1.164	0.299	*	0.578	1.750	0.58	1.16	1.75
MENTYES	-0.808	0.219	*	-1.237	-0.379	-1.24	-0.81	-0.38
AFRICAN	3.989	0.728	*	2.562	5.416	2.56	3.99	5.42
BANGLA	3.495	1.224	*	1.096	5.894	1.10	3.50	5.89
ENGFLUFU	1.245	0.425	*	0.412	2.078	0.41	1.25	2.08
KS3AVLOW	-0.812	0.266	*	-1.333	-0.291	-1.17	-0.72	-0.26
KS3CARIB	-1.008	0.396	*	-1.784	-0.232	-0.37	-0.21	-0.05
MENTLOW	0.824	0.370	*	0.099	1.549	0.10	0.82	1.55
KS3GNT	-0.844	0.222	*	-1.279	-0.409	-0.75	-0.49	-0.24
AMDEG	-3.421	1.175	*	-5.724	-1.118	-0.54	-0.32	-0.11
AFRGNT	-5.502	1.580	*	-8.599	-2.405	-8.60	-5.50	-2.41
YEARFF2	-0.107	0.027	*	-0.160	-0.054	-0.65	-0.44	-0.22
YEARFF3	0.149	0.025	*	0.100	0.198	0.38	0.57	0.75
KS3YEAR	-0.637	0.269	*	-1.164	-0.110	-1.06	-0.58	-0.10
SEXFF1	-0.042	0.012	*	-0.066	-0.018	-0.52	-0.33	-0.15
SEXFF5	0.040	0.015	*	0.011	0.069	0.07	0.25	0.43
BANGSEX	-2.865	1.425	*	-5.658	-0.072	-5.66	-2.87	-0.07

Percentage reduction = 75% of pupil variance

**Table 2. Cross-sectional – Capped 8 GCSE score (Year 11)**

totsc8 Score		Multilevel results						
Parameter	Estimate	Standard error	Sig.	95% Confidence interval				
				Min.	Max.			
<b>Base case</b>								
LEA variance	0.000	0.000	#DIV/0!	0.000	0.000			
School variance	33.140	4.102	*	25.100	41.180			
Pupil variance	153.848	1.622	*	150.669	157.027			
<b>Final model</b>								
LEA variance	0.000	0.000	#DIV/0!	0.000	0.000			
School variance	31.560	4.649	*	22.448	40.672			
School KS3 covar.	-5.322	0.826	*	-6.941	-3.703			
School KS3 variance	0.977	0.152	*	0.679	1.275			
Pupil variance	35.104	0.376	*	34.367	35.841	<b>Effect Size</b>		
<b>Fixed coefficients</b>			#DIV/0!	0.000	0.000			
CONS	-19.935	1.284	*	-22.452	-17.418	<b>Lower</b>	<b>Mean</b>	<b>Upper</b>
KS3AV	8.722	0.123	*	8.481	8.963	13.46	13.84	14.22
FAC2Y11	0.452	0.011	*	0.430	0.474	3.31	3.48	3.64
FAC4Y11	0.138	0.018	*	0.103	0.173	0.40	0.53	0.67
LIVEMF	1.407	0.190	*	1.035	1.779	1.03	1.41	1.78
MOTHONLY	0.773	0.198	*	0.385	1.161	0.38	0.77	1.16
BOOKS	0.309	0.035	*	0.240	0.378	0.52	0.67	0.82
MSECOND	0.365	0.119	*	0.132	0.598	0.13	0.37	0.60
MPOST16	0.382	0.147	*	0.094	0.670	0.09	0.38	0.67
MDEGREE	0.753	0.185	*	0.390	1.116	0.39	0.75	1.12
FDEGREE	0.624	0.154	*	0.322	0.926	0.32	0.62	0.93
FPOST16	0.388	0.134	*	0.125	0.651	0.13	0.39	0.65
FAC1TU_1	0.051	0.024	*	0.004	0.098	0.04	0.46	0.88
FAC2TU_1	0.095	0.025	*	0.046	0.144	0.38	0.79	1.20
q13b1_1	-0.786	0.381	*	-1.533	-0.039	-0.86	-0.44	-0.02
FSMYES	-1.509	0.126	*	-1.756	-1.262	-1.76	-1.51	-1.26
GNT	3.128	0.222	*	2.693	3.563	2.69	3.13	3.56
SEXYES	1.807	0.098	*	1.615	1.999	1.61	1.81	2.00
EXCLFYES	-3.104	0.260	*	-3.614	-2.594	-3.61	-3.10	-2.59
MOB1	-0.849	0.181	*	-1.204	-0.494	-1.20	-0.85	-0.49
EALYES	2.160	0.208	*	1.752	2.568	1.75	2.16	2.57
SENYES	-2.194	0.147	*	-2.482	-1.906	-2.48	-2.19	-1.91
WIDEPYES	0.637	0.206	*	0.233	1.041	0.23	0.64	1.04
MENTYES	-0.503	0.154	*	-0.805	-0.201	-0.80	-0.50	-0.20
AFRICAN	3.646	0.517	*	2.633	4.659	2.63	3.65	4.66
BANGLA	1.236	0.481	*	0.293	2.179	0.29	1.24	2.18
ENGFLUFU	1.041	0.297	*	0.459	1.623	0.46	1.04	1.62
KS3AVLOW	-0.461	0.164	*	-0.782	-0.140	-0.69	-0.41	-0.12
KS3CARIB	-0.687	0.281	*	-1.238	-0.136	-0.26	-0.14	-0.03
MENTLOW	0.708	0.258	*	0.202	1.214	0.20	0.71	1.21
KS3GNT	-1.240	0.156	*	-1.546	-0.934	-0.90	-0.72	-0.55
AMDEG	-2.006	0.834	*	-3.641	-0.371	-3.64	-2.01	-0.37
AFRGNT	-3.254	1.122	*	-5.453	-1.055	-5.45	-3.25	-1.05
YEARFF2	-0.076	0.019	*	-0.113	-0.039	-0.46	-0.31	-0.16
YEARFF3	0.104	0.018	*	0.069	0.139	0.26	0.40	0.53
WESTMID	1.055	0.403	*	0.265	1.845	0.27	1.06	1.84
FATONLY	0.758	0.296	*	0.178	1.338	0.18	0.76	1.34
SEXFF1	-0.035	0.009	*	-0.053	-0.017	-0.42	-0.28	-0.14

Percentage reduction = 77% of pupil variance

**Table 3. Cross-sectional – Average GCSE score (Year 11)**

Average Total score		Multilevel results						
Parameter	Estimate	Standard error	Sig.	95% Confidence interval		Effect Size		
				Min.	Max.	Lower	Mean	Upper
<b>Base case</b>								
LEA variance	0.000	0.000						
School variance	0.480	0.059	*	0.364	0.596			
Pupil variance	1.994	0.021	*	1.953	2.035			
<b>Final model</b>								
School variance	0.411	0.062	*	0.289	0.533			
School KS3 covar.	-0.070	0.011	*	-0.092	-0.048			
School KS3 variance	0.013	0.002	*	0.009	0.017			
Pupil variance	0.512	0.005	*	0.502	0.522			
<b>Fixed coefficients</b>								
CONS	-2.088	0.148	*	-2.378	-1.798	Lower	Mean	Upper
KS3AV	0.942	0.015	*	0.913	0.971	1.45	1.49	1.54
FAC2y11	0.054	0.001	*	0.052	0.056	0.40	0.42	0.43
FAC4 y11	0.016	0.002	*	0.012	0.020	0.05	0.06	0.08
LIVEMF	0.137	0.019	*	0.100	0.174	0.10	0.14	0.17
MOTHONLY	0.055	0.020	*	0.016	0.094	0.02	0.06	0.09
BOOKS	0.034	0.004	*	0.026	0.042	0.06	0.07	0.09
MDEGREE	0.071	0.019	*	0.034	0.108	0.03	0.07	0.11
FDEGREE	0.085	0.018	*	0.050	0.120	0.05	0.09	0.12
FPOST16	0.062	0.015	*	0.033	0.091	0.03	0.06	0.09
FAC2TU_1	0.013	0.003	*	0.007	0.019	0.06	0.11	0.16
Q12D_1	0.079	0.037	*	0.006	0.152	0.00	0.06	0.11
FSMYES	-0.166	0.015	*	-0.195	-0.137	-0.20	-0.17	-0.14
GNT	0.399	0.027	*	0.346	0.452	0.35	0.40	0.45
SEXYES	0.237	0.012	*	0.213	0.261	0.21	0.24	0.26
EXCLFYES	-0.282	0.031	*	-0.343	-0.221	-0.34	-0.28	-0.22
MOB1	-0.077	0.022	*	-0.120	-0.034	-0.12	-0.08	-0.03
EALYES	0.268	0.022	*	0.225	0.311	0.22	0.27	0.31
SENYES	-0.093	0.018	*	-0.128	-0.058	-0.13	-0.09	-0.06
WIDEPYES	0.057	0.025	*	0.008	0.106	0.01	0.06	0.11
MENTYES	-0.032	0.015	*	-0.061	-0.003	-0.06	-0.03	0.00
AFRICAN	0.370	0.062	*	0.248	0.492	0.25	0.37	0.49
BANGLA	0.115	0.058	*	0.001	0.229	0.00	0.12	0.23
WESTMID	0.121	0.059	*	0.005	0.237	0.01	0.12	0.24
KS3CARIB	-0.097	0.034	*	-0.164	-0.030	-0.03	-0.02	-0.01
KS3GNT	-0.082	0.019	*	-0.119	-0.045	-0.07	-0.05	-0.03
AMDEG	-0.251	0.101	*	-0.449	-0.053	-0.45	-0.25	-0.05
AFRGNT	-0.346	0.135	*	-0.611	-0.081	-0.04	-0.02	-0.01
YEARFF2	-0.006	0.002	*	-0.010	-0.002	-0.04	-0.02	-0.01
YEARFF3	0.012	0.002	*	0.008	0.016	0.03	0.05	0.06
KS3YEAR	-0.057	0.021	*	-0.098	-0.016	-0.09	-0.05	-0.01
YEARGP	0.157	0.046	*	0.067	0.247	0.07	0.16	0.25
KS3SEX	0.064	0.010	*	0.044	0.084	0.05	0.07	0.09
SEXFF1	-0.003	0.001	*	-0.005	-0.001	-0.04	-0.02	-0.01

*Percentage reduction = 74% of pupil variance*



**Table 4. Cross-sectional – Probability of achieving 5 or more A\* to C grades at GCSE (Year 11)**

5+ A* to C Grades		Multilevel results						
Parameter	Estimate	Standard error	Sig.	95% Confidence interval				
				Min.	Max.			
<b>Base case</b>								
School variance	-0.32	0.05	*	-0.41	-0.22			
<b>Final model</b>								
School variance	0.30	0.05	*	0.20	0.40			
School KS3 covar.	-0.09	0.04	*	-0.16	-0.02			
School KS3 variance	0.15	0.04	*	0.06	0.24			
<b>Fixed coefficients</b>						<b>Odds multiplier</b>		
CONS	0.15	0.12		-0.079	0.383	Lower	Mean	Upper
KS3AVC	2.289	0.08	*	2.134	2.444	8.45	9.87	11.52
AFRICAN	0.792	0.22	*	0.363	1.221	1.44	2.21	3.39
KS3AVLOW	-0.375	0.10	*	-0.561	-0.189	0.57	0.69	0.83
LIVEMF	0.206	0.05	*	0.108	0.304	1.11	1.23	1.36
EAZ	0.376	0.15	*	0.088	0.664	1.09	1.46	1.94
BOOKSC	0.1	0.02	*	0.067	0.133	1.07	1.11	1.14
NUMERACY	-0.267	0.08	*	-0.418	-0.116	0.66	0.77	0.89
SUMMER	-0.553	0.11	*	-0.759	-0.347	0.47	0.58	0.71
FAC2C	0.12	0.01	*	0.110	0.130	1.12	1.13	1.14
FAC4C	0.051	0.01	*	0.033	0.069	1.03	1.05	1.07
FDEGREE	0.193	0.08	*	0.044	0.342	1.05	1.21	1.41
EXCLFYES	-0.522	0.16	*	-0.826	-0.218	0.44	0.59	0.80
EALYES	0.74	0.09	*	0.566	0.914	1.76	2.10	2.50
WIDEPYES	0.399	0.10	*	0.211	0.587	1.23	1.49	1.80
MENTLOW	0.217	0.10	*	0.029	0.405	1.03	1.24	1.50
SENYES	-0.662	0.08	*	-0.827	-0.497	0.44	0.52	0.61
FSMYES	-0.352	0.07	*	-0.479	-0.225	0.62	0.70	0.80
GNT	1.009	0.11	*	0.799	1.219	2.22	2.74	3.38
KS3YEAR	0.248	0.12	*	0.011	0.485	1.01	1.28	1.62
GIRLSCH	-0.638	0.13	*	-0.899	-0.377	0.41	0.53	0.69
MOB1	-0.369	0.09	*	-0.540	-0.198	0.58	0.69	0.82
Q4FAC4C	0.191	0.06	*	0.073	0.309	1.08	1.21	1.36
YEARFF3	0.034	0.01	*	0.016	0.052	1.02	1.03	1.05
SEXYES	0.459	0.05	*	0.361	0.557	1.43	1.58	1.75
CARIBSEX	0.53	0.23	*	0.083	0.977	1.09	1.70	2.66

**Table 5. Cross-sectional – Attitudes to education (not including prior attainment) (Year 11)**

Y11fac2 Score		Multilevel results						
Parameter	Estimate	Standard error	Sig.	95% Confidence interval				
				Min.	Max.			
<b>Base case</b>								
LEA variance	0.000	0.000	#DIV/0!	0.000	0.000			
School variance	1.835	0.239	*	1.367	2.303			
Pupil variance	27.853	0.280	*	27.304	28.402			
<b>Final model</b>								
LEA variance	0.105	0.090	#DIV/0!	-0.071	0.281			
School variance	0.411	0.100	*	0.215	0.607			
Pupil variance	19.279	0.194	*	18.899	19.659			
						<b>Effect Size</b>		
<b>Fixed coefficients</b>								
CONS	-7.789	0.324	*	-8.424	-7.154	<b>Lower</b>	<b>Mean</b>	<b>Upper</b>
FAC1Y11	0.269	0.006	*	0.257	0.281	2.92	3.05	3.19
FAC3Y1	0.168	0.008	*	0.152	0.184	1.07	1.18	1.29
FAC4Y11	0.227	0.019	*	0.190	0.264	0.73	0.88	1.02
FAC5Y11	0.131	0.008	*	0.115	0.147	1.04	1.18	1.32
LIVEMF	0.447	0.067	*	0.316	0.578	0.32	0.45	0.58
BOOKS	0.437	0.022	*	0.394	0.480	0.86	0.95	1.05
FPOST16	0.440	0.089	*	0.266	0.614	0.27	0.44	0.61
FDEGREE	0.429	0.099	*	0.235	0.623	0.23	0.43	0.62
EAZ	0.656	0.189	*	0.286	1.026	0.29	0.66	1.03
GNT	0.988	0.111	*	0.770	1.206	0.77	0.99	1.21
SEXYES	0.861	0.067	*	0.730	0.992	0.73	0.86	0.99
EXCLFYES	-1.986	0.184	*	-2.347	-1.625	-2.35	-1.99	-1.63
EALYES	1.376	0.161	*	1.060	1.692	1.06	1.38	1.69
SENYES	-0.835	0.095	*	-1.021	-0.649	-1.02	-0.84	-0.65
MENTYES	-0.582	0.085	*	-0.749	-0.415	-0.75	-0.58	-0.42
INDIAN	0.581	0.215	*	0.160	1.002	0.16	0.58	1.00
PAKISTAN	1.259	0.216	*	0.836	1.682	0.84	1.26	1.68
YEARFF1	-0.052	0.009	*	-0.070	-0.034	-0.57	-0.43	-0.28
YEARFF3	-0.058	0.010	*	-0.078	-0.038	-0.30	-0.22	-0.15
YEARFF4	-0.168	0.025	*	-0.217	-0.119	-0.62	-0.48	-0.34
YEARFF5	-0.118	0.012	*	-0.142	-0.094	-0.70	-0.58	-0.47
SEXFF5	0.021	0.010	*	0.001	0.041	0.01	0.13	0.25
AFRICAN	0.882	0.289	*	0.316	1.448	0.32	0.88	1.45

*Percentage reduction = 31% of pupil variance*

**Table 6. Cross-sectional – Attitudes to education (including prior attainment) (Year 11)**

Y11fac2 Score		Multilevel results						
Parameter	Estimate	Standard error	Sig.	95% Confidence interval				
				Min.	Max.			
<b>Base case</b>								
LEA variance	0.000	0.000	#####	0.000	0.000			
School variance	1.836	0.240	*	1.366	2.306			
Pupil variance	27.853	0.280	*	27.304	28.402			
<b>Final model</b>								
LEA variance	1.540	0.085		1.373	1.707			
LEA	0.000	0.000		0.000	0.000			
ks3covariance								
LEA KS3variance	0.000	0.000		0.000	0.000			
School variance	2.250	0.696	*	0.886	3.614			
School ks3 covariance	-0.442	0.137	*	-0.711	-0.173			
School ks3 variance	0.097	0.028		0.042	0.152			
Pupil variance	18.830	0.201	*	18.436	19.224	<b>Effect Size</b>		
<b>Fixed coefficients</b>								
CONS	-11.018	0.438	*	-11.876	-10.160	<b>Lower</b>	<b>Mean</b>	<b>Upper</b>
ks3av	0.685	0.062	*	0.563	0.807	0.89	1.09	1.28
FAC1Y11	0.269	0.006	*	0.257	0.281	2.92	3.05	3.19
FAC3Y11	0.168	0.008	*	0.152	0.184	1.07	1.18	1.29
FAC4Y11	0.189	0.024	*	0.142	0.236	0.55	0.73	0.91
FAC5Y11	0.130	0.008	*	0.114	0.146	1.03	1.17	1.31
LIVEMF	0.386	0.071	*	0.247	0.525	0.25	0.39	0.53
BOOKS	0.353	0.024	*	0.306	0.400	0.67	0.77	0.87
FPOST16	0.389	0.093	*	0.207	0.571	0.21	0.39	0.57
FDEGREE	0.313	0.104	*	0.109	0.517	0.11	0.31	0.52
EAZ	-0.538	0.182	*	-0.895	-0.181	-0.89	-0.54	-0.18
GNT	0.401	0.122	*	0.162	0.640	0.16	0.40	0.64
SEXYES	1.005	0.071	*	0.866	1.144	0.87	1.01	1.14
EXCLFYES	-1.977	0.187	*	-2.344	-1.610	-2.34	-1.98	-1.61
EALYES	1.785	0.139	*	1.513	2.057	1.51	1.79	2.06
MENTYES	-0.570	0.089	*	-0.744	-0.396	-0.74	-0.57	-0.40
PAKISTAN	1.064	0.200	*	0.672	1.456	0.67	1.06	1.46
ENGFL12	2.151	0.628	*	0.920	3.382	0.92	2.15	3.38
ENGFLUC	0.827	0.301	*	0.237	1.417	0.24	0.83	1.42
KS3SEX	0.201	0.059	*	0.085	0.317	0.09	0.22	0.35
YEARFF1	-0.052	0.009	*	-0.070	-0.034	-0.57	-0.43	-0.28
YEARFF3	-0.063	0.015	*	-0.092	-0.034	-0.35	-0.24	-0.13
YEARFF4	-0.115	0.027	*	-0.168	-0.062	-0.48	-0.33	-0.18
YEARFF5	-0.116	0.012	*	-0.140	-0.092	-0.69	-0.57	-0.46
SEXFF4	-0.050	0.025	*	-0.099	-0.001	-0.28	-0.14	0.00
SEXFF5	0.027	0.011	*	0.005	0.049	0.03	0.17	0.30
KS3YEAR	-0.322	0.084	*	-0.487	-0.157	-0.44	-0.29	-0.14
African	0.686	0.307	*	0.084	1.288	0.08	0.69	1.29

Percentage reduction = 32% of pupil variance

**Table 7. Cross-sectional – Probability of good attitude and good behaviour (no background variables) (Year 11)**

Good Attitude/Good Behaviour		Multilevel results							
Parameter	Estimate	Standard error	Sig.	95% Confidence interval					
				Min.	Max.				
<b>Base case</b>									
School variance	0.01	0.03		-0.05	0.07				
<b>Final model</b>									
School variance	0.05	0.01	*	0.02	0.07				
<b>Fixed coefficients</b>						<b>Odds multiplier</b>			
CONS	-2.50	0.12	*	-2.741	-2.263	Lower	Mean	Upper	
Q3A1	-0.15	0.04	*	-0.216	-0.078	0.81	0.86	0.92	
Q3C1	0.14	0.04	*	0.063	0.209	1.07	1.15	1.23	
Q3D1	0.24	0.04	*	0.165	0.311	1.18	1.27	1.36	
Q12A	0.39	0.07	*	0.261	0.523	1.30	1.48	1.69	
Q12B	-0.20	0.07	*	-0.330	-0.060	0.72	0.82	0.94	
Q12C	0.46	0.07	*	0.337	0.591	1.40	1.59	1.81	
Q12D	0.21	0.10	*	0.010	0.402	1.01	1.23	1.49	
Q13	0.64	0.04	*	0.563	0.709	1.76	1.89	2.03	
Q14G	0.50	0.04	*	0.424	0.566	1.53	1.64	1.76	
Q14J	0.19	0.04	*	0.110	0.278	1.12	1.21	1.32	
Q14K	0.25	0.04	*	0.172	0.324	1.19	1.28	1.38	
Q14L	0.25	0.04	*	0.177	0.325	1.19	1.29	1.38	
Q16A	0.15	0.04	*	0.067	0.227	1.07	1.16	1.26	
Q16C	-0.58	0.04	*	-0.652	-0.500	0.52	0.56	0.61	
Q16I	0.38	0.04	*	0.305	0.453	1.36	1.46	1.57	
Q16G	-0.41	0.03	*	-0.479	-0.345	0.62	0.66	0.71	
Q16K	-0.45	0.07	*	-0.584	-0.322	0.56	0.64	0.72	
Q16L	-0.42	0.04	*	-0.502	-0.338	0.61	0.66	0.71	
Q17	0.13	0.02	*	0.098	0.156	1.10	1.14	1.17	
Q18A	0.43	0.04	*	0.358	0.506	1.43	1.54	1.66	
Q18B	0.33	0.04	*	0.255	0.403	1.29	1.39	1.50	
Q18D	0.10	0.04	*	0.021	0.169	1.02	1.10	1.18	
Q19D	-0.09	0.04	*	-0.159	-0.017	0.85	0.92	0.98	
Q19G	-0.09	0.04	*	-0.162	-0.014	0.85	0.92	0.99	
Q20	0.16	0.04	*	0.090	0.236	1.09	1.18	1.27	

**Table 8. Cross-sectional – Probability of good attitude and good behaviour (with background variables) (Year 11)**

Good Attitude/Good Behaviour		Multilevel results							
Parameter	Estimate	Standard error	Sig.	95% Confidence interval					
				Min.	Max.				
<b>Base case</b>									
School variance	0.010	0.03		-0.05	0.07				
<b>Final model</b>									
School variance	0.046	0.01	*	0.02	0.07				
<b>Fixed coefficients</b>						<b>Odds multiplier</b>			
CONS	-2.245	0.105	*	-2.451	-2.039	Lower	Mean	Upper	
Q3D1	0.231	0.037	*	0.158	0.304	1.17	1.26	1.35	
Q12A	0.377	0.066	*	0.248	0.506	1.28	1.46	1.66	
Q12B	-0.146	0.068	*	-0.279	-0.013	0.76	0.86	0.99	
Q12C	0.414	0.063	*	0.291	0.537	1.34	1.51	1.71	
Q12D	0.202	0.094	*	0.018	0.386	1.02	1.22	1.47	
Q13	0.561	0.037	*	0.488	0.634	1.63	1.75	1.88	
Q14G	0.484	0.036	*	0.413	0.555	1.51	1.62	1.74	
Q14J	0.212	0.042	*	0.130	0.294	1.14	1.24	1.34	
Q14K	0.252	0.038	*	0.178	0.326	1.19	1.29	1.39	
Q14L	0.250	0.038	*	0.176	0.324	1.19	1.28	1.38	
Q16A	0.189	0.040	*	0.111	0.267	1.12	1.21	1.31	
Q16C	-0.559	0.038	*	-0.633	-0.485	0.53	0.57	0.62	
Q16I	0.359	0.038	*	0.285	0.433	1.33	1.43	1.54	
Q16G	-0.410	0.034	*	-0.477	-0.343	0.62	0.66	0.71	
Q16K	-0.374	0.066	*	-0.503	-0.245	0.60	0.69	0.78	
Q16L	-0.400	0.042	*	-0.482	-0.318	0.62	0.67	0.73	
Q18A	0.415	0.037	*	0.342	0.488	1.41	1.51	1.63	
Q18B	0.347	0.038	*	0.273	0.421	1.31	1.41	1.52	
Q18D	0.118	0.037	*	0.045	0.191	1.05	1.13	1.21	
Q19G	-0.094	0.037	*	-0.167	-0.021	0.85	0.91	0.98	
CBOOKS	0.079	0.012	*	0.055	0.103	1.06	1.08	1.11	
PARED	-0.161	0.045	*	-0.249	-0.073	0.78	0.85	0.93	
MENTYES	-0.250	0.044	*	-0.336	-0.164	0.71	0.78	0.85	
GNT	0.272	0.059	*	0.156	0.388	1.17	1.31	1.47	
YEARGP	0.130	0.062	*	0.008	0.252	1.01	1.14	1.29	
EXCLFYES	-1.058	0.115	*	-1.283	-0.833	0.28	0.35	0.43	
LIVEMF	0.272	0.035	*	0.203	0.341	1.23	1.31	1.41	
EAZ	-0.170	0.072	*	0.203	0.341	1.23	1.31	1.41	
EALYES	0.233	0.058	*	-0.311	-0.029	0.73	0.84	0.97	
SENYES	-0.270	0.050	*	0.119	0.347	1.13	1.26	1.41	
Q3A1	-0.094	0.035	*	-0.368	-0.172	0.69	0.76	0.84	
Q3C1	0.145	0.036	*	-0.163	-0.025	0.85	0.91	0.97	
SEXYES	0.268	0.035	*	0.074	0.216	1.08	1.16	1.24	

**Table 9. Cross-sectional – Probability of stating an intention of going to university (Year 11)**

Going to University		Multilevel results						
Parameter	Estimate	Standard error	Sig.	95% Confidence interval				
				Min.	Max.			
<b>Base case</b>								
School variance	0.28	0.04	*	0.19	0.36			
<b>Final model</b>								
School variance	0.06	0.01	*	0.03	0.08			
<b>Fixed coefficients</b>						<b>Odds multiplier</b>		
CONS	-2.872	0.11	*	-3.090	-2.654	Lower	Mean	Upper
PARED	0.431	0.05	*	0.331	0.531	1.39	1.54	1.70
CBOOKS	0.177	0.02	*	0.148	0.206	1.16	1.19	1.23
FIVEPLUS	1.187	0.05	*	1.097	1.277	2.99	3.28	3.59
GNT	0.559	0.07	*	0.432	0.686	1.54	1.75	1.99
Q13	0.310	0.05	*	0.212	0.408	1.24	1.36	1.50
Q14J	-0.156	0.05	*	-0.252	-0.060	0.78	0.86	0.94
Q16A	1.238	0.06	*	1.126	1.350	3.08	3.45	3.86
Q16C	-0.798	0.05	*	-0.900	-0.696	0.41	0.45	0.50
Q16L	-1.005	0.06	*	-1.125	-0.885	0.32	0.37	0.41
Q18A	0.162	0.05	*	0.074	0.250	1.08	1.18	1.28
Q18C	-0.163	0.05	*	-0.251	-0.075	0.78	0.85	0.93
Q18E	0.612	0.05	*	0.522	0.702	1.69	1.84	2.02
Q19A	0.489	0.05	*	0.393	0.585	1.48	1.63	1.80
Q19B	0.369	0.04	*	0.283	0.455	1.33	1.45	1.58
Q19E	0.425	0.05	*	0.337	0.513	1.40	1.53	1.67
Q12A	-0.333	0.07	*	-0.474	-0.192	0.62	0.72	0.83
SEXYES	0.289	0.04	*	0.205	0.373	1.23	1.34	1.45
MENTYES	-0.126	0.05	*	-0.230	-0.022	0.79	0.88	0.98
GBGA	0.320	0.04	*	0.234	0.406	1.26	1.38	1.50
Q3A1	-0.096	0.04	*	-0.178	-0.014	0.84	0.91	0.99
Q3D1	0.100	0.04	*	0.014	0.186	1.01	1.11	1.20
whiteuk	-0.426	0.05	*	-0.530	-0.322	0.59	0.65	0.72

**Table 10. Longitudinal – Total GCSE score (Year 11)**

Total GCSE Score		Multilevel results							
Parameter	Estimate	Standard error	Sig.	95% Confidence interval					
				Min.	Max.	Lower	Mean	Upper	
<b>Base case</b>									
School variance	53.147	9.066	*	35.378	70.916				
Pupil variance	288.188	4.261	*	279.836	296.540				
<b>Final model</b>									
School variance	84.061	17.050	*	50.643	117.479				
School KS3 covar.	-16.043	3.420	*	-22.746	-9.340				
School variance	KS3 3.748	0.745	*	2.288	5.208				
Pupil variance	83.769	1.264	*	81.292	86.246				
<b>Fixed coefficients</b>									
CONS	-34.286	2.301	*	-38.796	-29.776	20.89	22.28	23.67	
KS3AV	14.461	0.460	*	13.559	15.363	-0.71	-0.42	-0.14	
FF1CHG	-0.029	0.010	*	-0.049	-0.009	0.60	0.89	1.17	
FF2CHG	0.140	0.023	*	0.095	0.185	0.09	0.37	0.66	
FF5CHG	0.039	0.015	*	0.010	0.068	0.21	0.84	1.48	
BOTHPAR	1.983	0.261	*	1.471	2.495	-2.68	-2.00	-1.32	
LIVEMUM	0.842	0.324	*	0.207	1.477	-2.64	-2.10	-1.55	
SENYES	-1.999	0.348	*	-2.681	-1.317	0.37	0.94	1.51	
FSMYES	-2.095	0.280	*	-2.644	-1.546	2.61	3.58	4.54	
FDEGREE	0.940	0.291	*	0.370	1.510	-2.98	-2.06	-1.15	
GNTBOTH	3.576	0.494	*	2.608	4.544	1.42	2.76	4.11	
MENTBOTH	-2.064	0.468	*	-2.981	-1.147	3.37	4.38	5.39	
GNT02	2.763	0.686	*	1.418	4.108	-3.93	-2.95	-1.97	
GNT03	4.379	0.514	*	3.372	5.386	0.16	1.18	2.20	
MENT02	-2.947	0.500	*	-3.927	-1.967	0.07	1.68	3.28	
EXCLYES	-5.188	0.599	*	-6.362	-4.014	-3.05	-2.26	-1.48	
WIDEP03	1.180	0.521	*	0.159	2.201	-3.63	-2.66	-1.68	
WIDEBOTH	1.676	0.817	*	0.075	3.277	-2.33	-1.39	-0.46	
KS3AVLOW	-2.855	0.506	*	-3.847	-1.863	2.15	2.57	3.00	
KS3AVMID	-2.185	0.409	*	-2.987	-1.383	0.44	1.12	1.79	
KS3AVHIGH	-2.862	0.981	*	-4.785	-0.939	0.36	1.10	1.83	
SEX	2.574	0.217	*	2.149	2.999	1.20	1.60	2.01	
SUMBOTH	1.118	0.345	*	0.442	1.794	0.12	0.77	1.42	
UNIBOTH	1.096	0.373	*	0.365	1.827	0.07	0.31	0.56	
Q19FAM	1.354	0.174	*	1.013	1.695	-0.85	-0.50	-0.14	
SUMSCH02	0.772	0.331	*	0.123	1.421	-1.21	-0.82	-0.43	
KS3Q19FAM	0.300	0.118	*	0.069	0.531	0.34	0.64	0.94	
KS3Q19UNI	-0.392	0.143	*	-0.672	-0.112	3.86	4.55	5.25	
SEXQ19FAM	-0.982	0.240	*	-1.452	-0.512	1.02	1.35	1.67	
SEXQ19UNI	0.899	0.215	*	0.478	1.320				
EALYES	4.553	0.355	*	3.857	5.249				
BOOKSC	0.603	0.074	*	0.458	0.748				

Percentage reduction = 71% of pupil variance

**Table 11. Longitudinal – Capped 8 GCSE score (Year 11)**

Best 8 Score		Multilevel results			95% Confidence interval				
Parameter	Estimate	Standard error	Sig.	Min.	Max.				
<b>Base case</b>									
School variance	26.601	4.525	*	17.732	35.470				
Pupil variance	146.659	2.168	*	142.410	150.908				
<b>Final model</b>									
School variance	38.621	7.768	*	23.396	53.846				
School KS3 covar.	-6.042	1.291	*	-8.572	-3.512				
School KS3 variance	1.011	0.222	*	0.576	1.446				
Pupil variance	38.357	0.574	*	37.232	39.482				
<b>Fixed coefficients</b>									
CONS	-19.211	1.561	*	-22.271	-16.151	Lower	Mean	Upper	
KS3AV	10.475	0.297	*	9.893	11.057	15.24	16.14	17.03	
FF1CHG	-0.027	0.007	*	-0.041	-0.013	-0.59	-0.39	-0.19	
FF2CHG	0.117	0.015	*	0.088	0.146	0.56	0.74	0.93	
FF4CHG	-0.045	0.020	*	-0.084	-0.006	-0.40	-0.22	-0.03	
FF5CHG	0.026	0.010	*	0.006	0.046	0.06	0.25	0.44	
BOTHPAR	1.359	0.177	*	1.012	1.706	1.01	1.36	1.71	
LIVEMUM	0.694	0.219	*	0.265	1.123	0.26	0.69	1.12	
SENYES	-1.799	0.235	*	-2.260	-1.338	-2.26	-1.80	-1.34	
FSMYES	-1.540	0.189	*	-1.910	-1.170	-1.91	-1.54	-1.17	
FDEGREE	0.814	0.196	*	0.430	1.198	0.43	0.81	1.20	
GNTBOTH	1.793	0.325	*	1.156	2.430	1.16	1.79	2.43	
MENTBOTH	-1.292	0.316	*	-1.911	-0.673	-1.91	-1.29	-0.67	
GNT02	2.015	0.455	*	1.123	2.907	1.12	2.02	2.91	
GNT03	2.719	0.339	*	2.055	3.383	2.05	2.72	3.38	
MENT02	-2.231	0.338	*	-2.893	-1.569	-2.89	-2.23	-1.57	
EXCLYES	-1.092	0.405	*	-1.886	-0.298	-1.89	-1.09	-0.30	
WIDEP03	0.716	0.341	*	0.048	1.384	0.05	0.72	1.38	
KS3AVLOW	-1.930	0.318	*	-2.553	-1.307	-2.02	-1.53	-1.03	
KS3AVMID	-1.577	0.269	*	-2.104	-1.050	-2.56	-1.92	-1.28	
KS3AVHIGH	-2.665	0.597	*	-3.835	-1.495	-1.87	-1.30	-0.73	
SEX	1.935	0.146	*	1.649	2.221	1.65	1.94	2.22	
UNIBOTH	0.864	0.246	*	0.382	1.346	0.38	0.86	1.35	
Q19FAM	0.871	0.117	*	0.642	1.100	0.76	1.03	1.30	
KS3Q19UNI	-0.363	0.093	*	-0.545	-0.181	-0.57	-0.38	-0.19	
SEXQ19FAM	-0.697	0.162	*	-1.015	-0.379	-0.85	-0.58	-0.32	
SEXQ19UNI	0.723	0.145	*	0.439	1.007	0.31	0.51	0.71	
SUMBOTH	0.639	0.227	*	0.194	1.084	0.19	0.64	1.08	
EALYES	3.055	0.237	*	2.590	3.520	2.59	3.06	3.52	
KS3AVEAL	-0.486	0.190	*	-0.858	-0.114	-0.59	-0.33	-0.08	
HIGH	2.942	1.085	*	0.815	5.069	0.82	2.94	5.07	
BOOKSC	0.463	0.050	*	0.365	0.561	0.82	1.03	1.25	

*Percentage reduction = 74% of pupil variance*



**Table 12. Longitudinal – Average GCSE score (Year 11)**

Average Score		Multilevel results							
Parameter	Estimate	Standard error	Sig.	95% Confidence interval					
				Min.	Max.	Lower	Mean	Upper	
<b>Base case</b>									
School variance	0.426	0.072	*	0.285	0.567				
Pupil variance	2.004	0.030	*	1.945	2.063				
<b>Final model</b>									
School variance	0.464	0.098	*	0.272	0.656				
School KS3 covar.	-0.075	0.017	*	-0.108	-0.042				
School KS3 variance	0.014	0.003	*	0.008	0.020				
Pupil variance	0.569	0.009	*	0.551	0.587				
<b>Fixed coefficients</b>									
CONS	-2.384	0.183	*	-2.743	-2.025	1.80	1.91	2.02	
KS3AV	1.238	0.036	*	1.167	1.309	-0.07	-0.04	-0.02	
FF1CHG	-0.003	0.001	*	-0.005	-0.001	0.06	0.09	0.11	
FF2CHG	0.014	0.002	*	0.010	0.018	-0.04	-0.02	-0.01	
FF4CHG	-0.005	0.002	*	-0.009	-0.001	0.01	0.03	0.05	
FF5CHG	0.003	0.001	*	0.001	0.005	0.12	0.16	0.20	
BOTHPAR	0.160	0.022	*	0.117	0.203	0.02	0.08	0.13	
LIVEMUM	0.077	0.027	*	0.024	0.130	-0.22	-0.18	-0.13	
FSMYES	-0.175	0.023	*	-0.220	-0.130	0.06	0.10	0.15	
FDEGREE	0.104	0.024	*	0.057	0.151	0.20	0.28	0.36	
GNTBOTH	0.283	0.040	*	0.205	0.361	-0.23	-0.15	-0.08	
MENTBOTH	-0.152	0.038	*	-0.226	-0.078	0.09	0.20	0.31	
GNT02	0.197	0.056	*	0.087	0.307	0.30	0.38	0.46	
GNT03	0.378	0.042	*	0.296	0.460	-0.37	-0.29	-0.21	
MENT02	-0.288	0.041	*	-0.368	-0.208	-0.50	-0.41	-0.31	
EXCLYES	-0.406	0.049	*	-0.502	-0.310	-0.26	-0.20	-0.13	
KS3AVLOW	-0.247	0.040	*	-0.325	-0.169	-0.31	-0.23	-0.15	
KS3AVMID	-0.190	0.033	*	-0.255	-0.125	-0.20	-0.13	-0.07	
KS3AVHIGH	-0.277	0.072	*	-0.418	-0.136	0.24	0.28	0.31	
SEX	0.275	0.018	*	0.240	0.310	0.05	0.11	0.17	
UNIBOTH	0.110	0.030	*	0.051	0.169	0.08	0.12	0.15	
Q19FAM	0.099	0.014	*	0.072	0.126	-0.05	-0.03	0.00	
KS3Q19UNI	-0.026	0.011	*	-0.048	-0.004	-0.09	-0.06	-0.03	
SEXQ19FAM	-0.071	0.020	*	-0.110	-0.032	0.04	0.06	0.09	
SEXQ19UNI	0.090	0.018	*	0.055	0.125	0.03	0.09	0.14	
SUMBOTH	0.089	0.028	*	0.034	0.144	0.00	0.06	0.11	
SUMSCH02	0.057	0.027	*	0.004	0.110	0.29	0.34	0.40	
EALYES	0.343	0.029	*	0.286	0.400	-0.07	-0.04	-0.01	
KS3AVEAL	-0.060	0.023	*	-0.105	-0.015	0.23	0.51	0.80	
HIGH	0.512	0.145	*	0.228	0.796	0.09	0.12	0.14	
BOOKSC	0.052	0.006	*	0.040	0.064				

*Percentage reduction = 72% of pupil variance*

**Table 13. Longitudinal – Probability of achieving 5 or more A\* to C grades at GCSE (Year 11)**

5+ A* to C Grades		Multilevel results				95% Confidence interval		
Parameter	Estimate	Standard error	Sig.	Min.	Max.			
<b>Base case</b>								
School variance	0.33	0.06	*	0.21	0.45			
<b>Final model</b>								
School variance	0.35	0.07	*	0.21	0.49			
<b>Fixed coefficients</b>						<b>Odds multiplier</b>		
CONS	0.01	0.10		-0.182	0.206	Lower	Mean	Upper
KS3AVC	2.085	0.08	*	1.920	2.250	6.82	8.04	9.48
BOTHPAR	0.238	0.07	*	0.109	0.367	1.11	1.27	1.44
FDEGREE	0.336	0.10	*	0.140	0.532	1.15	1.40	1.70
FSMYES	-0.377	0.09	*	-0.544	-0.210	0.58	0.69	0.81
GNTBOTH	1.421	0.26	*	0.904	1.938	2.47	4.14	6.95
MENTBOTH	-0.358	0.14	*	-0.638	-0.078	0.53	0.70	0.93
EXCLFYES	-0.941	0.20	*	-1.331	-0.551	0.26	0.39	0.58
Q19TUTC	-0.142	0.04	*	-0.224	-0.060	0.80	0.87	0.94
Q19FAMC	0.218	0.04	*	0.138	0.298	1.15	1.24	1.35
Q19UNIC	0.174	0.05	*	0.076	0.272	1.08	1.19	1.31
FF2CHGC	0.029	0.01	*	0.015	0.043	1.02	1.03	1.04
EALYES	0.946	0.12	*	0.719	1.173	2.05	2.58	3.23
SENYES	-0.556	0.12	*	-0.791	-0.321	0.45	0.57	0.73
SUMBOTH	0.281	0.11	*	0.067	0.495	1.07	1.32	1.64
SEX	0.37	0.07	*	0.241	0.499	1.27	1.45	1.65
WIDEP03	0.375	0.16	*	0.065	0.685	1.07	1.45	1.98
WIDEBOTH	0.661	0.25	*	0.169	1.153	1.18	1.94	3.17
HIGH	1.13	0.42	*	0.315	1.945	1.37	3.10	7.00
GNT03	0.813	0.20	*	0.423	1.203	1.53	2.25	3.33
GNT02	0.853	0.25	*	0.355	1.351	1.43	2.35	3.86
BOOKSC	0.152	0.02	*	0.109	0.195	1.12	1.16	1.22

**Table 14. Longitudinal – Impact of Aimhigher: Excellence Challenge activities on decision to go to university (Year 11)**

Go to university		Multilevel results						
Parameter	Estimate	Standard error	Sig.	95% Confidence interval		Odds multiplier		
				Min.	Max.	Lower	Mean	Upper
<b>Fixed coefficients</b>								
Constant	-0.54	0.13	*	-0.783	-0.289	Lower	Mean	Upper
SEYES	0.41	0.10	*	0.221	0.598	1.25	1.51	1.82
KS3AVC	0.23	0.05	*	0.126	0.338	1.13	1.26	1.40
Q19A	0.39	0.11	*	0.181	0.598	1.20	1.48	1.82
LOW	0.26	0.11	*	0.038	0.486	1.04	1.30	1.63
HIGH	0.77	0.24	*	0.299	1.237	1.35	2.16	3.44
BOTHPAR	0.23	0.10	*	0.037	0.430	1.04	1.26	1.54

**Table 15. Cross-sectional – Average Key Stage 3 score (Year 9)**

Average KS3		Multilevel results						
Parameter	Estimate	Standard error	Sig.	95% Confidence interval				
				Min.	Max.	Lower	Mean	Upper
<b>Base case</b>								
Lea variance	0.009	0.044		-0.077	0.095			
School variance	0.257	0.036	*	0.186	0.328			
Pupil variance	1.145	0.013	*	1.120	1.170			
<b>Final model</b>								
			#DIV/0!					
LEA variance	0.110	0.053	*					
LEA ks2cov	-0.022	0.012						
LEA ks2 variance	0.004	0.003						
school variance	0.152	0.047	*	0.060	0.244			
school ks2cov	-0.040	0.012	*	-0.064	-0.016			
School ks2 variance	0.012	0.003	*	0.006	0.018			
Pupil variance	0.305	0.003	*	0.299	0.311			
<b>Fixed coefficients</b>								
CONS	0.250	0.158		-0.060	0.560	Lower	Mean	Upper
KS2AV	1.048	0.023	*	1.003	1.093	1.14	1.19	1.25
q3summer	0.069	0.014	*	0.042	0.096	0.04	0.07	0.10
q18tut	-0.022	0.007	*	-0.036	-0.008	-0.03	-0.02	-0.01
q18uni	0.037	0.008	*	0.021	0.053	0.02	0.03	0.04
fac1y9	-0.002	0.001	*	-0.004	0.000	-0.05	-0.02	0.00
fac2y9	0.009	0.002	*	0.005	0.013	0.04	0.07	0.11
fac3y9	-0.005	0.001	*	-0.007	-0.003	-0.07	-0.05	-0.03
fac4y9	0.028	0.002	*	0.024	0.032	0.12	0.13	0.15
ealyes	0.061	0.018	*	0.026	0.096	0.03	0.06	0.10
gntyas	0.372	0.018	*	0.337	0.407	0.34	0.37	0.41
senyes	-0.287	0.014	*	-0.314	-0.260	-0.31	-0.29	-0.26
fsmyes	-0.106	0.012	*	-0.130	-0.082	-0.13	-0.11	-0.08
widpyes	0.178	0.028	*	0.123	0.233	0.12	0.18	0.23
exclfyas	-0.159	0.031	*	-0.220	-0.098	-0.22	-0.16	-0.10
mob1	-0.096	0.028	*	-0.151	-0.041	-0.15	-0.10	-0.04
carib	-0.137	0.039	*	-0.213	-0.061	-0.21	-0.14	-0.06
bangla	0.135	0.052	*	0.033	0.237	0.03	0.14	0.24
bothpar	0.032	0.010	*	0.012	0.052	0.01	0.03	0.05
books	0.062	0.003	*	0.056	0.068	0.12	0.14	0.15
mdegree	0.036	0.016	*	0.005	0.067	0.00	0.04	0.07
fdegree	0.062	0.015	*	0.033	0.091	0.03	0.06	0.09
fac2tu_1	0.014	0.004	*	0.006	0.022	0.05	0.11	0.17
yearph1	-0.139	0.051	*	-0.239	-0.039	-0.24	-0.14	-0.04
low	-0.316	0.066	*	-0.445	-0.187	-0.45	-0.32	-0.19
mid	-0.210	0.056	*	-0.320	-0.100	-0.32	-0.21	-0.10
mentyes	-0.055	0.014	*	-0.082	-0.028	-0.08	-0.06	-0.03
ye2002	0.197	0.047	*	0.105	0.289	0.07	0.14	0.20
ks2avlow	-0.162	0.026	*	-0.213	-0.111	-0.13	-0.10	-0.07
ks2avmid	-0.117	0.021	*	-0.158	-0.076	-0.13	-0.10	-0.06
ks2carib	-0.137	0.033	*	-0.202	-0.072	-0.04	-0.03	-0.01
carrisex	0.105	0.051	*	0.005	0.205	0.01	0.11	0.20
indsex	0.100	0.034	*	0.033	0.167	0.03	0.10	0.17
chinsex	0.299	0.094	*	0.115	0.483	0.11	0.30	0.48
cfdeg	-0.170	0.071	*	-0.309	-0.031	-0.31	-0.17	-0.03
amdeg	0.164	0.056	*	0.054	0.274	0.05	0.16	0.27
imdeg	-0.109	0.052	*	-0.211	-0.007	-0.21	-0.11	-0.01
afrgnt	-0.328	0.096	*	-0.516	-0.140	-0.52	-0.33	-0.14
yearff2	0.016	0.002	*	0.012	0.020	0.08	0.10	0.13
yearff3	-0.004	0.001	*	-0.006	-0.002	-0.04	-0.03	-0.01
yearff4	-0.011	0.003	*	-0.017	-0.005	-0.06	-0.04	-0.02

*Percentage reduction = 73% of pupil variance*

**Table 16. Cross-sectional – English Key Stage 3 score (Year 9)**

KS3 English		Multilevel results			95% Confidence interval				
Parameter	Estimate	Standard error	Sig.	Min.	Max.				
<b>Base case</b>									
Lea variance	0.009	0.044		-0.077	0.095				
School variance	0.300	0.060	*	0.182	0.418				
Pupil variance	1.378	0.016	*	1.347	1.409				
<b>Final model</b>									
			#DIV/0!						
LEA variance	0.213	0.113							
LEA ks3cov	-0.056	0.026	*						
LEA ks3 variance	0.014	0.006	*						
school variance	0.382	0.109	*	0.168	0.596				
school ks3cov	-0.070	0.023	*	-0.115	-0.025				
School variance	0.016	0.005	*	0.006	0.026				
Pupil variance	0.556	0.006	*	0.544	0.568				
<b>Fixed coefficients</b>									
CONS	0.324	0.210		-0.088	0.736	<b>Lower</b>	<b>Mean</b>	<b>Upper</b>	
KS2AV	0.914	0.033	*	0.849	0.979	0.97	1.04	1.12	
q3summer	0.060	0.019	*	0.023	0.097	0.02	0.06	0.10	
q18uni	0.028	0.011	*	0.006	0.050	0.01	0.02	0.04	
fac1y9	-0.002	0.001	*	-0.004	0.000	-0.05	-0.02	0.00	
fac2y9	0.013	0.002	*	0.009	0.017	0.08	0.11	0.14	
fac3y9	-0.004	0.001	*	-0.006	-0.002	-0.06	-0.04	-0.02	
fac4y9	0.030	0.004	*	0.022	0.038	0.11	0.14	0.18	
sexyes	0.345	0.013	*	0.320	0.370	0.32	0.35	0.37	
ealyes	0.070	0.024	*	0.023	0.117	0.02	0.07	0.12	
gntyas	0.302	0.028	*	0.247	0.357	0.25	0.30	0.36	
senyes	-0.437	0.020	*	-0.476	-0.398	-0.48	-0.44	-0.40	
fsmyes	-0.130	0.016	*	-0.161	-0.099	-0.16	-0.13	-0.10	
widpyes	0.170	0.038	*	0.096	0.244	0.10	0.17	0.24	
exclfyas	-0.161	0.043	*	-0.245	-0.077	-0.25	-0.16	-0.08	
whiteeu	0.190	0.069	*	0.055	0.325	0.05	0.19	0.33	
bothpar	0.052	0.014	*	0.025	0.079	0.02	0.05	0.08	
books	0.057	0.005	*	0.047	0.067	0.10	0.13	0.15	
mdegree	0.090	0.023	*	0.045	0.135	0.04	0.09	0.14	
msecond	0.046	0.015	*	0.017	0.075	0.01	0.03	0.05	
mpost16	0.067	0.018	*	0.032	0.102	0.03	0.07	0.10	
fdgree	0.042	0.021	*	0.001	0.083	0.00	0.04	0.08	
fac2tu_1	0.019	0.005	*	0.009	0.029	0.07	0.15	0.22	
low	-0.200	0.063	*	-0.323	-0.077	-0.32	-0.20	-0.08	
westmid	-0.212	0.057	*	-0.324	-0.100	-0.32	-0.21	-0.10	
mentyes	-0.083	0.019	*	-0.120	-0.046	-0.12	-0.08	-0.05	
ks2avlow	-0.115	0.035	*	-0.184	-0.046	-0.11	-0.07	-0.03	
ks2avmid	-0.068	0.028	*	-0.123	-0.013	-0.10	-0.06	-0.01	
ks2carib	-0.127	0.044	*	-0.213	-0.041	-0.04	-0.02	-0.01	
ks2bang	-0.218	0.066	*	-0.347	-0.089	-0.04	-0.03	-0.01	
ks2afric	-0.129	0.048	*	-0.223	-0.035	-0.04	-0.02	-0.01	
gntlow	0.128	0.053	*	0.024	0.232	0.02	0.13	0.23	
pfdeg	0.182	0.091	*	0.004	0.360	0.00	0.18	0.36	
imdeg	-0.162	0.070	*	-0.299	-0.025	-0.30	-0.16	-0.02	
afrment	0.198	0.095	*	0.012	0.384	0.01	0.20	0.38	
yearff2	0.016	0.003	*	0.010	0.022	0.06	0.10	0.14	
yearff3	-0.004	0.002	*	-0.008	0.000	-0.06	-0.03	0.00	
yearff4	-0.011	0.004	*	-0.019	-0.003	-0.07	-0.04	-0.01	
yearff5	0.012	0.003	*	0.006	0.018	0.02	0.04	0.07	
sexff4	-0.012	0.004	*	-0.020	-0.004	-0.07	-0.04	-0.01	

Percentage reduction = 60% of pupil variance

**Table 17. Cross-sectional – Mathematics Key Stage 3 score (Year 9)**

KS3 Maths		Multilevel results						
Parameter	Estimate	Standard error	Sig.	95% Confidence interval				
				Min.	Max.	Lower	Mean	Upper
<b>Base case</b>								
Lea variance	0.000	0.000	#DIV/0!	0.000	0.000			
School variance	0.266	0.038	*	0.192	0.340			
Pupil variance	1.569	0.018	*	1.534	1.604			
<b>Final model</b>								
Lea variance	0.186	0.093	*	0.004	0.368			
Lea ks2 cov	-0.047	0.024		-0.094	0.000			
Lea ks2 variance	0.012	0.007		-0.002	0.026			
school variance	0.255	0.085	*	0.088	0.422			
School ks2 cov	-0.068	0.022	*	-0.111	-0.025			
school variance	0.020	0.006	*	0.008	0.032			
Pupil variance	0.550	0.007	*	0.536	0.564			
<b>Fixed coefficients</b>								
CONS	-0.242	0.197		-0.628	0.144	Lower	Mean	Upper
KS2AV	1.272	0.033	*	1.207	1.337	1.38	1.45	1.52
q3summer	0.082	0.020	*	0.043	0.121	0.04	0.08	0.12
q18tut	-0.034	0.010	*	-0.054	-0.014	-0.05	-0.03	-0.01
q18uni	0.042	0.012	*	0.018	0.066	0.02	0.04	0.06
fac1y9	-0.002	0.001	*	-0.004	0.000	-0.05	-0.02	0.00
fac3y9	-0.008	0.001	*	-0.010	-0.006	-0.10	-0.08	-0.06
fac4y9	0.035	0.003	*	0.029	0.041	0.14	0.17	0.20
sexyes	-0.178	0.014	*	-0.205	-0.151	-0.21	-0.18	-0.15
ealyes	0.093	0.027	*	0.040	0.146	0.04	0.09	0.15
gntyas	0.432	0.026	*	0.381	0.483	0.38	0.43	0.48
senyas	-0.210	0.019	*	-0.247	-0.173	-0.25	-0.21	-0.17
fsmyes	-0.068	0.016	*	-0.099	-0.037	-0.10	-0.07	-0.04
widpyes	0.204	0.039	*	0.128	0.280	0.13	0.20	0.28
exclfyas	-0.092	0.042	*	-0.174	-0.010	-0.17	-0.09	-0.01
carib	-0.183	0.056	*	-0.293	-0.073	-0.29	-0.18	-0.07
indian	0.107	0.045	*	0.019	0.195	0.02	0.11	0.20
bangla	0.375	0.106	*	0.167	0.583	0.17	0.38	0.58
bothpar	0.030	0.014	*	0.003	0.057	0.00	0.03	0.06
books	0.055	0.005	*	0.045	0.065	0.10	0.12	0.14
fdegree	0.077	0.020	*	0.038	0.116	0.04	0.08	0.12
fac2tu_1	0.011	0.003	*	0.005	0.017	0.04	0.08	0.13
q12c_1	-0.116	0.036	*	-0.187	-0.045	-0.14	-0.08	-0.03
q4fac1	-0.044	0.016	*	-0.075	-0.013	-0.11	-0.07	-0.02
comp	0.194	0.067	*	0.063	0.325	0.06	0.19	0.33
mentyas	-0.057	0.019	*	-0.094	-0.020	-0.09	-0.06	-0.02
ks2avlow	-0.198	0.035	*	-0.267	-0.129	-0.16	-0.12	-0.08
ks2avmid	-0.188	0.029	*	-0.245	-0.131	-0.21	-0.16	-0.11
ks2carib	-0.151	0.048	*	-0.245	-0.057	-0.05	-0.03	-0.01
ks2afric	-0.150	0.048	*	-0.244	-0.056	-0.05	-0.03	-0.01
caribsex	0.148	0.073	*	0.005	0.291	0.00	0.15	0.29
indsex	0.129	0.059	*	0.013	0.245	0.01	0.13	0.24
bangsex	-0.371	0.143	*	-0.651	-0.091	-0.65	-0.37	-0.09
chinsex	0.409	0.136	*	0.142	0.676	0.14	0.41	0.68
cfdeg	-0.395	0.100	*	-0.591	-0.199	-0.59	-0.40	-0.20
yearff2	0.018	0.002	*	0.014	0.022	0.09	0.11	0.14
yearff4	-0.011	0.004	*	-0.019	-0.003	-0.07	-0.04	-0.01
yearhigh	0.544	0.111	*	0.326	0.762	0.33	0.54	0.76

*Percentage reduction = 65% of pupil variance*

**Table 18. Cross-sectional – Probability of stating an intention of going to university (Year 9)**

Going to University		Multilevel results								
Parameter	Estimate	Standard error	Sig.	95% Confidence interval						
				Min.	Max.					
<b>Base case</b>										
School variance	0.16	0.03	*	0.10	0.22					
<b>Final model</b>										
School variance	0.04	0.01	*	0.02	0.06					
<b>Fixed coefficients</b>						<b>Odds multiplier</b>				
CONS	-2.840	0.10	*	-3.038	-2.642	Lower	Mean	Upper		
Q3G1	-0.147	0.04	*	-0.229	-0.065	0.80	0.86	0.94		
Q13	0.194	0.05	*	0.098	0.290	1.10	1.21	1.34		
Q14J	-0.277	0.05	*	-0.365	-0.189	0.69	0.76	0.83		
Q14M	0.196	0.04	*	0.112	0.280	1.12	1.22	1.32		
Q16A	0.731	0.06	*	0.615	0.847	1.85	2.08	2.33		
Q16B	-0.527	0.04	*	-0.611	-0.443	0.54	0.59	0.64		
Q16E	2.092	0.05	*	1.988	2.196	7.30	8.10	8.99		
Q16H	-0.837	0.07	*	-0.968	-0.706	0.38	0.43	0.49		
Q3VISUNI	-0.112	0.04	*	-0.196	-0.028	0.82	0.89	0.97		
Q18FAM	0.169	0.03	*	0.112	0.226	1.12	1.18	1.25		
Q18UNI	0.205	0.03	*	0.138	0.272	1.15	1.23	1.31		
EALYES	0.274	0.08	*	0.123	0.425	1.13	1.32	1.53		
GNTYES	0.492	0.07	*	0.357	0.627	1.43	1.64	1.87		
SENYES	-0.677	0.07	*	-0.806	-0.548	0.45	0.51	0.58		
FSMYES	-0.121	0.05	*	-0.225	-0.017	0.80	0.89	0.98		
WHITEUK	-0.144	0.07	*	-0.273	-0.015	0.76	0.87	0.99		
CBOOKS	0.195	0.02	*	0.166	0.224	1.18	1.22	1.25		
MDEGREE	0.177	0.06	*	0.055	0.299	1.06	1.19	1.35		
FDEGREE	0.328	0.06	*	0.208	0.448	1.23	1.39	1.56		

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