Playing for Success: the Longer Term Impact A Multilevel Analysis

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Executive Summary

The *Playing for Success* (PfS) initiative is targeted on underachieving young people. It aims to contribute to raising educational standards, especially in numeracy and literacy, bringing the attainment levels of lower achieving pupils closer to the average expected for their age. Previous national evaluation studies have measured pupils' performance at the start and end of their attendance at PfS Centres. The results have shown clear evidence of significant improvements, especially in numeracy and information and communications technology (ICT). This exploratory study sets out to consider whether an analysis of information in the National Pupil Database (NPD) could provide a useful indication of longer-term changes in pupils' performance in National Curriculum Assessments, thereby contributing to the national evaluation of PfS.

Key findings

The analysis indicated that at key stage (KS) 2:

pupils who attended PfS and took their National Curriculum Assessments in 2002 made around one month's less progress than KS2 pupils who did not attend, in terms of their average score; but

lower attaining pupils who attended PfS made up to two months' greater progress in their KS2 assessments; whereas

higher attaining pupils who attended PfS made less progress in their KS2 assessments, by up to two months.

The analysis indicated that at key stage (KS) 3:

pupils who attended PfS made around two months' greater progress than pupils who did not attend, in relation to their average KS3 score; and

secondary schools which sent some of their pupils to PfS made greater progress than schools which did not participate, in terms of their KS3 mathematics and science results. The additional progress was equivalent to about three months.

Aims of the study

The study set out to explore the potential usefulness of a statistical approach to investigate the impact of attending *Playing for Success* on subsequent pupil performance in National Curriculum Assessments. In particular it sought to establish:

Whether pupils who attended *Playing for Success* made a similar amount of progress to pupils who did not participate, taking account of the influence of key background characteristics that are known to influence academic progress

Whether there was evidence of differential outcomes related to a pupil's key stage or to the amount of time that had elapsed between a pupil's attendance at the initiative and their National Curriculum Assessments.

Background

Playing for Success is a national initiative, established in 1997 by the Department for Education and Skills in partnership with the FA Premier League and their clubs, and local education authorities. Since then it has expanded to include a wide range of professional sports, including cricket and rugby. It aims to contribute to raising educational standards, especially in urban areas, by setting up Study Support Centres in professional football clubs and other sports venues. The initiative has expanded from six Centres in 1997 to over 100 signed up in 2004.

Playing for Success focuses on underachieving young people, mainly in Years 6 to 9, and places a strong emphasis on improving pupils' attitudes and motivation to learn. Centres are managed by experienced teachers. They use the medium and environment of sport to support pupils' work in literacy, numeracy and ICT. Pupils attend the Centres after school for around 20 hours during a period of about ten weeks.

Methodology

This exploratory study compared the academic performance at KS2 and KS3 of pupils who had attended PfS Centres with the performance of pupils who did not attend. The analysis focused on progress in performance (between KS1 and KS2 or KS2 and KS3) and took account of pupil characteristics known to influence academic performance.

The NFER contacted 24 PfS Centres which took pupils in the academic years 1999–2000, 2000–2001 and 2001–2, requesting data on pupils who went on to take their National Curriculum Assessments in 2002. Seven Centres were able to provide pupil-level data. (The participating Centres had a different profile from the remaining 17 Centres in certain respects: in particular, the schools sending pupils to these seven Centres had a significantly higher proportion of pupils who were eligible for free school meals.)

The lists of pupils were compared with information from the NPD, resulting in a sample of 828 pupils in KS2 and 284 pupils in KS3 (the PfS group). The remaining 17 Centres were asked to list the schools that had sent pupils to their Centre during the relevant period. As it was not known which pupils from these schools had attended PfS, the results of the entire group of Year 6 or Year 9 pupils were excluded from the analysis. The comparison (non-PfS) group comprised the remaining national cohort of pupils who took their National Curriculum Assessments in 2002.

In order to make fair comparisons, the study used multilevel modelling to take account of pupil, school and LEA factors known to influence pupil progress (including such variables as prior attainment, sex, ethnicity, eligibility for free school meals, SEN status and school size). Separate multilevel models were constructed for KS2 and KS3. There were four attainment measures in each case: pupils' average point scores and point scores for each of the three core subjects (English, mathematics and science). The models included three variables relating to specifically to PfS: pupil involvement; school involvement; and a variable designed to establish whether the impact of PfS might vary according to pupils' prior attainment. Results were statistically significant at the five per cent level ($p < 0.05$).

Other findings

The study investigated whether the time that had elapsed between a pupil's attendance at PfS and their assessments made any difference to their progress. There was no indication of a statistically significant relationship between this variable and the progress of PfS pupils in either KS2 or KS3.

Investigation of an impact at school level revealed no evidence of an impact of PfS participation on the progress achieved by the school at KS2.

For secondary pupils, the analysis indicated that higher attaining KS3 pupils who attended PfS did better than expected in English, whereas lower attaining pupils who attended PfS did less well. Nevertheless, an analysis of the progress achieved by 162 lower attaining pupils (those attaining less than Level 4 at KS2) indicated that their performance in English was not significantly different from that of lower attaining pupils who had not attended.

Conclusions and implications

This study has provided an interesting opportunity to consider the longer-term progress of pupils who attended *Playing for Success*. However, it should be emphasised that this was an exploratory study and, because of the relatively small numbers involved (especially at KS3) the results should be treated with caution.

This study has found evidence of a small effect (of around one or two months of progress) of PfS on pupil attainment after they had left the Centres. It has suggested that the effect may differ for primary and secondary-age pupils, for different subjects and for pupils with different levels of attainment. There is also some evidence of a small positive effect on whole school performance for secondary schools participating in PfS. The time that has elapsed between a pupil's attendance and the Key Stage Assessments does not appear to influence his or her progress, although there may be insufficient variation in the 'elapsed time' (because most KS2 pupils attended in Year 6) to enable any conclusions to be drawn about the "best time" for pupils to attend.

These findings are tentative, but they do point to the potential usefulness of this approach as part of an evaluation strategy for *Playing for Success*. The main reason for the small sample size was that the study was attempting to gather information retrospectively. We therefore recommend that the DfES, in partnership with the PfS Centres, consider developing a system to capture data as pupils attend the Centres so that their subsequent attainment in National Curriculum Assessments can be investigated.

1. Introduction

Playing for Success (PfS) was established in 1997. The broad aim of the initiative was to contribute to raising educational standards, especially in numeracy and literacy. It was targeted on underachieving young people in Key Stages 2 and 3 and was particularly concerned with bringing the attainment of lower achieving pupils closer to the average expected for their age. Pupils attended Study Support Centres after school for around 20 hours during a period of about ten weeks (see Sharp *et al.*, 2002). The initiative began by establishing Centres in English professional football clubs. The number of Centres has grown from six established in 1997 to over a hundred signed up in 2004. The initiative has also expanded to encompass sports other than football. Further information on PfS can be found on the website: www.dfes.gov.uk/playingforsuccess

The NFER has been responsible for the national evaluation of PfS for four consecutive years (Sharp *et al.*, 1999, 2001, 2002, 2003). The evaluation studies measured pupils' performance and attitudes at the start and end of their attendance at PfS Centres. The results have shown clear evidence of significant improvements on several measures, especially numeracy and ICT, during the pupils' time at the Centres. However, the evaluation was not able to address the question of whether or not the initiative has led to longer-term changes in pupils' performance. This report represents an initial attempt to find an appropriate method for answering this question.

2. Aims and objectives

The study set out to explore the potential usefulness of a statistical approach to investigate the impact of attending PfS on subsequent pupil performance in National Curriculum Assessments. In particular it sought to establish:

The main research questions were:

What is the progress of pupils who have attended PfS in National Curriculum Assessments?

Did pupils who attended PfS make a similar amount of progress to pupils who did not participate, taking account of the influence of key background characteristics?

Is there any evidence of differential outcomes related to a pupil's Key Stage?

Is there any evidence of differential outcomes related to the amount of time that has elapsed between a pupil's attendance at PfS and their National Curriculum Assessments?

3. Methodology

3.1 Study design

In common with other NFER studies on the impact of national initiatives (see for example, Schagen and Schagen 2001, 2002a and b; Schagen *et al*., 2002; Speilhofer *et al*., 2002), this study made use of the National Pupil Database (NPD), held by the Department of Education and Skills (DfES). The NPD is a 'data warehouse' which brings together value-added national performance data with pupil-level information from the Pupil Level Annual Schools Census (PLASC). It links pupil performance in Key Stage (KS) 1, 2 and 3 assessments to GCSE/GNVQ results. In this study we focused on pupils' progress from KS1 to KS2 and from KS2 to KS3, using the 2002 dataset – the most recent available at the time.

3.1.1 Target population

The study focused on the population of pupils who took their KS2 or KS3 National Curriculum Assessments in 2002. The population was divided into two main groups for the purposes of this study: those who were known to have attended PfS Centres (the PfS group) and a much larger population of pupils who did not attend PfS (the non-PfS group).

The PfS group comprised cohorts of pupils in Years 6 and 9 who took their National Curriculum Assessments in 2002 and who attended PfS Centres in the academic year 2001–2. In addition, the study collected data on pupils who took their National Curriculum Assessments in 2002 but who attended PfS in previous years. This concerned pupils in Year 7 in 1999–2000 and those in Years 5 and 8 in 2000–2001. The sample design is illustrated in Figure 1.

Figure 1: *Playing for Success* cohorts included in the study
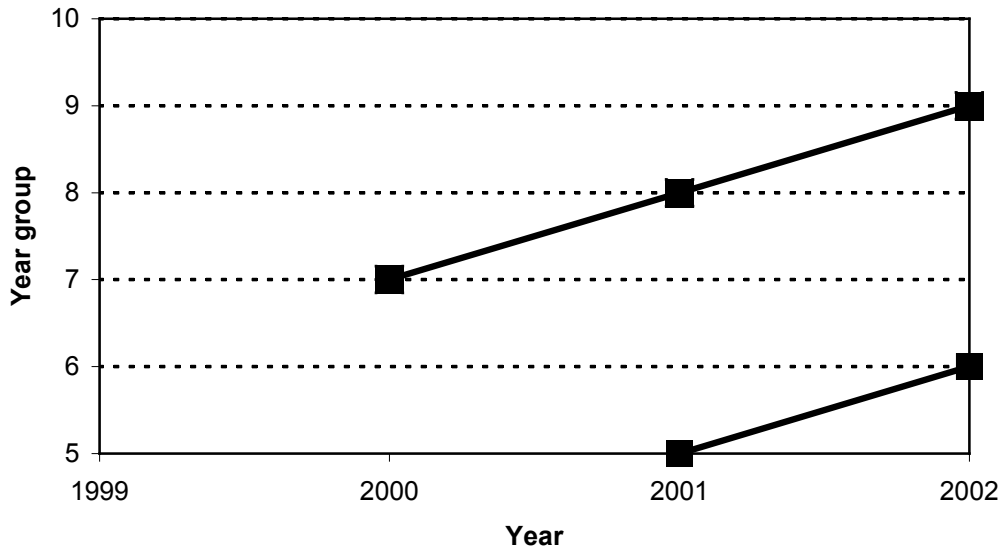
3.1.2 Method of analysis

The study used multilevel modelling to consider the evidence for the effects of PfS on young people's subsequent attainment, while controlling for other factors known to influence attainment. Multilevel modelling is a recent development of regression analysis which takes account of data which is grouped into similar clusters at different levels. For example, individual pupils are grouped into year groups or cohorts, and those cohorts are grouped within schools. There may be more in common between pupils within the same cohort than with other cohorts, and there may be elements of similarity between different cohorts in the same school.

Multilevel modelling allows statisticians to take account of this hierarchical structure of the data and produce more accurate predictions, as well as estimates of the differences between pupils, between cohorts, and between schools. It seemed a particularly suitable method of analysis to adopt for this study, because of the need to make 'fair' comparisons between a small population of young people who participated in PfS and the much larger population of young people who took their National Curriculum Assessments in 2002.

The models set up for the current study included all pupils in the NPD with valid data on KS2 or KS3 outcomes in 2002 and on their prior attainment (at KS1 or KS2 respectively). The sample included identified PfS pupils but excluded schools known

to be involved in PfS but for which individual pupils were not identified. The models were run with three levels: LEA, school and pupil.

The variables included in the model are detailed in the Appendix. A range of background factors has been shown to impact on pupil performance in National Curriculum Assessments in England (see Benton *et al*., 2003; Schagen and Benton, 2003). These were controlled for in the models at pupil or school level. The pupil-level factors included prior attainment, sex, ethnicity, having English as an additional language, eligibility for free school meals and special educational needs (SEN) status. School-level variables included the percentage of pupils eligible for school meals and school size.

Three variables relating to PfS itself were included in the model:
    Whether the individual pupil was involved in PfS
    Whether the school had pupils involved in PfS
    An interaction term to investigate whether the relationship with prior attainment was different for PfS pupils.

These variables were included in order to detect any possible impact of PfS on individuals attending it, as well as a potential impact on the school as a whole. Furthermore, the research team considered that it was possible that the impact of PfS might vary according to the level of prior attainment (for example, lower attaining pupils may benefit from a programme aimed at underachieving young people to a greater extent than those achieving at around the average for their age). The interaction term was included to explore this possibility.

The outcome measures available in the NPD were the National Curriculum Assessment results for the three core subjects: mathematics, English and science. In addition, each pupil's average KS2 score was calculated for the three core subjects. In line with DfES 'value added' measures, we used point scores (1 Level = 6 points) for each pupil in each subject.

When attempting multilevel modelling, it is important to keep the number of variables included in the model to a minimum, while ensuring that all key variables are

included. One of the aims of the study was to establish whether the length of time that had elapsed between a pupil's attendance at PfS and their end of key stage assessments was likely to have a relationship with their progress in the key stage assessments. We investigated this using Ordinary Least Squares (a form of basic regression analysis) before proceeding to enter the variable into the model. The initial analysis found no significant relationship between this variable and pupil progress, so it was not included in the multilevel model for either KS2 or KS3.

3.2 Procedure

In outline, the procedure for this exploratory study comprised the following steps:

1. Identify *Playing for Success* Centres operating in previous years. Approach Centre Managers to find out whether they are willing to participate and are able to provide the necessary data.

2. Obtain NPD for appropriate cohorts, including national pupil-level information on variables such as sex, ethnicity, pupils with English as an additional language, special needs and entitlement to free school meals. For schools and year groups involved in PfS, obtain the names and dates of birth of all pupils.

3. Obtain a list of names, dates of birth and schools for pupils in the specified cohorts who took part in PfS during 2002 and the previous two years. In cases where full records were not available, obtain a list of schools linked with the non-responding Centres. Exclude the results of these schools from the 'non-PfS' group in the analysis. Match the two sets of information, and obtain a national dataset with pupils involved in PfS flagged for each year.

4. Carry out preliminary analysis. Set up and run a multilevel analysis of progress from KS1 to KS2 and from KS2 to KS3, controlling for all relevant school and pupil background factors, and including PfS attendance as a variable.

5. Report any apparent significant effects of PfS attendance on progress in the outcome measures, relative to that expected from national data, as well as apparent interactions between PfS attendance and other background factors.

3.2.1 Initial scoping work

The NFER, in collaboration with Rex Hall (*Playing for Success* Critical Friend), identified Centres that were open and taking pupils in the 2000–1 academic year. We

then approached the relevant Centre Managers. The purpose of this was to establish whether Centre Managers would be willing and able to provide the necessary pupil-level data.

An email request was sent to 24 Centre Managers. All of these Centres were associated with football clubs. Centre Managers were requested to say whether they could provide the following for each pupil in the selected cohorts:

    School DfES number (or school name, address and LEA)

    First and last name

    Date of birth

    Sex

    School term of attendance at PfS (if possible).

Centres not able to provide pupil-level data were requested to say whether they could provide a list of schools that sent pupils to the Centre in the given year. The response was encouraging, so the DfES made the decision to proceed with the study.

3.2.2 Sampling

Data collection took place in January 2004. We obtained pupil-level data from seven Centres. Unfortunately, 17 of the Centre Managers who initially expressed a willingness to participate found that they were, in fact, unable to provide pupil-level data. This happened for various reasons (most commonly because pupil records had been destroyed when Centres had upgraded their IT systems, or because records had been lost during a change of venue or a change of key members of Centre staff).

The seven Centres provided data on 1496 pupils in the specified year groups. The remaining 17 Centres provided lists of schools which sent pupils to the Centre during the period in question. This enabled the research team to exclude these schools' assessment results from the analysis.

We undertook an analysis to compare the seven Centres participating in the study with the other 17 PfS Centres. We did this by considering the characteristics of schools sending pupils to the Centres (type/sector of school, English region, LEA type, school achievement band and percentage of pupils eligible for free school meals).

The following differences were statistically significant at the five per cent level (p<0.05). The seven participating Centres served schools with significantly higher proportions of pupils eligible for free school meals. Primary schools in the participating Centres were more likely to have low achievement in National Curriculum Assessments. Secondary schools in participating Centres were less likely to be based in the English midlands or in county LEAs. In other respects, the schools sending pupils to the two groups of Centres were similar to one another.

3.3 Analysis

Results for KS2 and KS3 were analysed separately, although a similar procedure was followed in each case.

3.3.1 Matching of KS2 data

Seven Centres identified 1069 KS1 pupils who had attended PfS and taken the KS2 tests in 2002. The lists were compared with the NPD for Year 6 pupils in 2002, resulting in 946 successful matches (88%). Of these, a total of 828 pupils had valid outcomes for both KS1 and KS2. They attended a total of 77 schools. These 828 pupils were assigned to the 'PfS' group.

Other pupils in the same schools were included in the 'non-PfS' group alongside the national cohort of Year 6 pupils. In the case of schools which had sent pupils to the Centres but where we were unable to identify which individuals had attended, the results of the entire cohort of Year 6 pupils were excluded from the analysis. Altogether a total of 543,688 Year 6 pupils were included in the modelling exercise.

3.3.2 Matching of KS3 data

The seven Centres identified 427 KS3 pupils who had attended PfS and taken the KS3 tests in 2002. These were compared with NPD data for 2002 Year 9 pupils, resulting in 314 successful matches (74%). Of these, a total of 284 PfS pupils had valid outcomes for both KS2 and KS3. They attended 27 schools. These 284 pupils were assigned to the 'PfS' group.

Other pupils in the same schools were included in the 'non-PfS' group. The results of pupils in schools which had been identified as sending pupils to PfS, but for which no matched cases were obtained, were excluded from the analysis. Altogether a total of 507,589 Year 9 pupils were included in the modelling exercise.

4. Findings

The findings were considered separately for pupils in KS2 and KS3.

4.1 Results of multilevel modelling at KS2

The models included the results of all pupils in the NPD with valid KS1 prior attainment and KS2 outcomes in 2002, including identified PfS pupils and others in the same schools, but excluding schools known to be involved in PfS but for which individual pupils were not identified. The model took account of a range of background factors (see Appendix) and included 828 cases (of pupils who had attended PfS and for whom attainment data could be matched). Analyses were run with three levels: LEA, school and pupil. The outcomes used were average KS2 point scores (1 level = 6 points) and point scores for each of the three core subjects (which could range from 3 to 39). The findings reported below are based on 828 pupils attending PfS at seven Centres during the period 1999–2002.

Table 1 shows the coefficients (point score gains) estimated by the multilevel models for each of the four outcome measures (average KS2 score, mathematics, English and science score). Only coefficients which were statistically significant at the five per cent level (p<0.05) are shown.

Table 1: Point score gains* for PfS pupils at KS2

Outcome measure	Individual progress	School progress	Interaction with prior attainment
KS2 average score	-0.27 (-1.1)		-0.17
KS2 mathematics score	-0.44 (-1.8)		-0.24
KS2 English score			-0.18
KS2 science score			-0.04

*This table shows the significant coefficients (point score gains) for KS2 PfS pupils compared with non-PfS pupils, and (in brackets) the equivalent months of progress.

Table 1 presents evidence of pupils who attended PfS doing less well than expected in terms of their average KS2 score and in mathematics, but in line with expectations in English and science. Progress of one Level is equal to six points or 24 months of progress (see Appendix for further information on the equivalence between Levels,

points and months of progress). Therefore pupils attending PfS made 1.1 months' less progress in their average KS2 score and 1.8 months' less progress in mathematics than other children of the same age who did not attend PfS.

There is no evidence of a statistically significant relationship between schools which sent pupils to PfS and the attainment of the entire year group.

The interaction term indicates a significant negative relationship for all four outcomes. This suggests that PfS pupils' progress has a weaker relationship with prior attainment than expected. This relationship is illustrated in Figure 2.

Figure 2: KS2 average performance of PfS pupils compared with non-PfS pupils
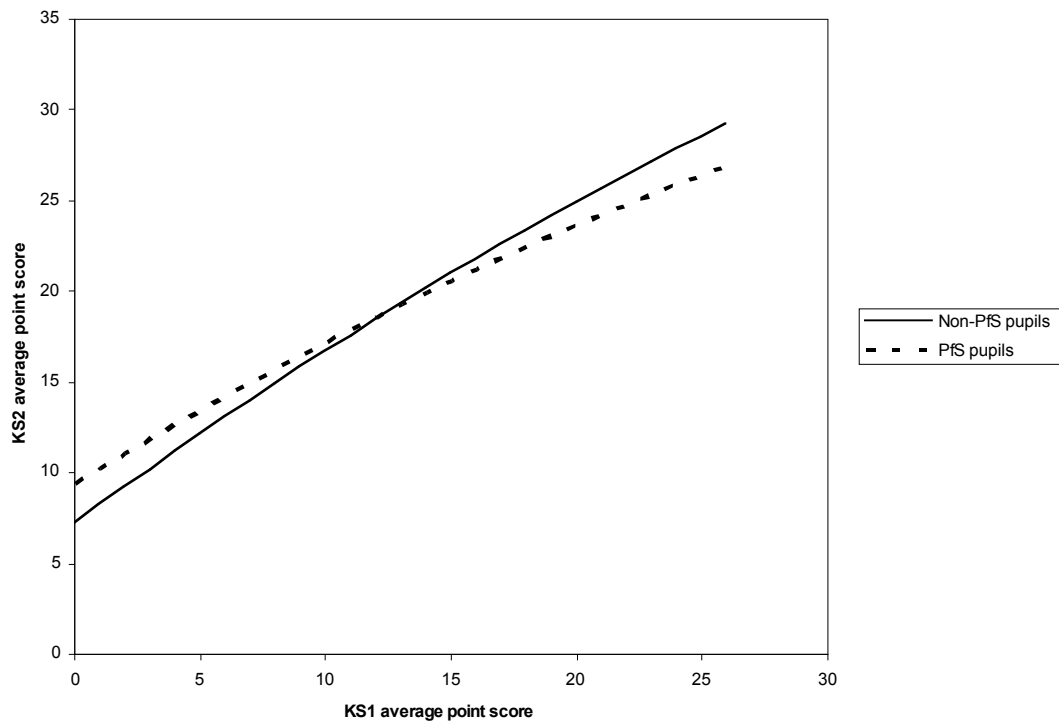
Based on the coefficients in the multilevel model, Figure 2 shows that lower attaining pupils who attended PfS Centres did better than expected in their KS2 assessments, whereas higher-attaining pupils who attended did less well than expected, taking into account their background characteristics. At the lower end of the attainment band, a pupil attaining only five points at KS1 and attending PfS is likely to achieve about two points more at KS2 than a pupil with similar low attainment at KS1 who did not attend PfS. The opposite is true at the higher end of the attainment band.

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A similar pattern was evident in the results for each of the three subjects (English, mathematics and science) at KS2.

4.1.1 Impact of PfS on lower attaining pupils at KS2

The curvilinear relationship between performance and prior attainment suggested that PfS may have had a larger impact with lower attaining pupils. To investigate this further, the multilevel models were rerun excluding all pupils with a KS1 average Level of 2B or above (15 points or more). This cut off was chosen because most pupils achieve Level 2B or above at KS1. It therefore seemed sensible to define pupils achieving Level 2C or below as 'lower attaining'.

The total number of pupils achieving Level 2C or below at KS1 was 252,567, of whom 458 were PfS pupils. Results of this analysis are shown in Table 2.

Table 2: Point score gains* for lower attaining PfS pupils at KS2

Outcome measure	Individual progress**	School progress	Interaction with prior attainment
KS2 average score	0.25 (1.0)		-0.30
KS2 mathematics score	0.19 (0.8)	0.50 (2.0)	-0.40
KS2 English score	0.20 (0.8)		-0.41
KS2 science score	0.53 (2.1)		-0.18

*This table shows the significant coefficients (point score gains) for KS2 PfS lower attaining pupils compared with non-PfS lower attaining pupils, and (in brackets) the equivalent months of progress.
**The indicator of individual progress represents the expected impact of PfS at the average prior attainment (11.8 points) for this group of lower attaining pupils.

The results shown in Table 2 indicate that attending PfS was positively related to progress during KS2 for lower attaining pupils. Compared to pupils who had not attended PfS, pupils that had attended PfS made, on average, 0.25 more points of progress in their KS2 tests: equivalent to one month more progress. The amount of progress differed according to subject, with PfS pupils attaining a progress score of 0.19 points for mathematics (or 0.8 months of progress); a progress score of 0.20 in English (or 0.8 months of progress) and a progress score of 0.53 points in science (or 2.1 months of progress). The indication here is that lower attaining pupils attending

PfS made the equivalent of up to two months' greater progress than lower attaining pupils of the same age who had not attended.

The table also indicates a positive effect at the school level for mathematics. This suggests that schools sending lower attaining pupils to PfS made greater progress in mathematics at KS2, by about two months of progress.

The interaction term shows a significant negative relationship for all four outcomes. As before, this implies that PfS pupils' progress at KS2 has a weaker relationship with prior attainment than expected. Even among lower attaining pupils, those who had the lowest prior attainment and attended PfS had better outcomes than expected, whereas those who were attaining at just below national expectations and attended PfS made the expected amount of progress.

4.2 Results of multilevel modelling at KS3

We used a similar approach to analyse the KS3 data, although we should point out that this analysis was based on far fewer cases (we had matched data for only 284 Y9 pupils in 2002 who had attended PfS).

The same approach was used to construct the multilevel model for KS3 as had been used for KS2. As noted above, we investigated the influence of the time elapsed between PfS attendance and the KS3 tests. There was no significant relationship between this variable and progress so it was not included in the multilevel model.

The models included all pupils in the NPD with valid KS2 prior attainment and KS3 outcomes in 2002. The sample included the results of identified PfS pupils and others in the same schools, but excluded the results from schools known to be involved in PfS but for which individual pupils were not identified. The model took account of similar background factors as in the KS2 analysis (see Appendix for further details). Analyses were run with three levels: LEA, school and pupil. The outcomes used were average KS3 point scores (1 level = 6 points) and point scores for each of the three core subjects (which could range from 9 to 57).

Table 3 shows the coefficients estimated by the multilevel models for each outcome, for the three PfS variables: individual level, school level and interaction (which may indicate a different relationship between prior attainment and outcome for PfS pupils than for pupils in Year 9 nationally). Only coefficients which are significant at the five per cent level are shown.

**Table 3: Point score gains* for PfS pupils at KS3**

Outcome measure	Individual progress	School progress	Interaction with prior attainment
KS3 average score	0.61 (2.4)		
KS3 mathematics score		0.79 (3.2)	
KS3 English score	0.70 (2.8)		0.15
KS3 science score		0.76 (3.0)	

*This table shows the significant coefficients (point score gains) for KS3 PfS pupils compared with non-PfS pupils, and (in brackets) the equivalent months of progress.

From the information presented in Table 3, there is evidence of PfS pupils doing better than expected in average KS3 score and in English. The additional progress in KS3 average score is equivalent to 2.4 months and the additional progress in KS3 English score is equivalent to 2.8 months. On the other hand, for mathematics and science it seems that it is the schools as a whole which are doing slightly better than expected. For example, pupils in PfS schools (those which sent some pupils to PfS) attained on average 0.79 points more in KS3 mathematics than expected. This is equivalent to 3.2 months of extra progress. The additional progress in science at KS3 for PfS schools is equivalent to 3.0 months.

The interaction term is statistically significant for KS3 English (but not for mathematics, science or average score). This implies that PfS pupils' attainment in English had a stronger relationship with prior attainment than expected. Another way of expressing this is to say that the impact of PfS on English at KS3 may be positive for those with higher prior attainment and negative for those with lower prior attainment. This is illustrated in Figure 3, which shows the expected performance of PfS pupils in English compared with national expectations, based on the model coefficients shown in Table 3.

Figure 3: Expected performance in English for PfS pupils compared with non-PfS pupils at KS3
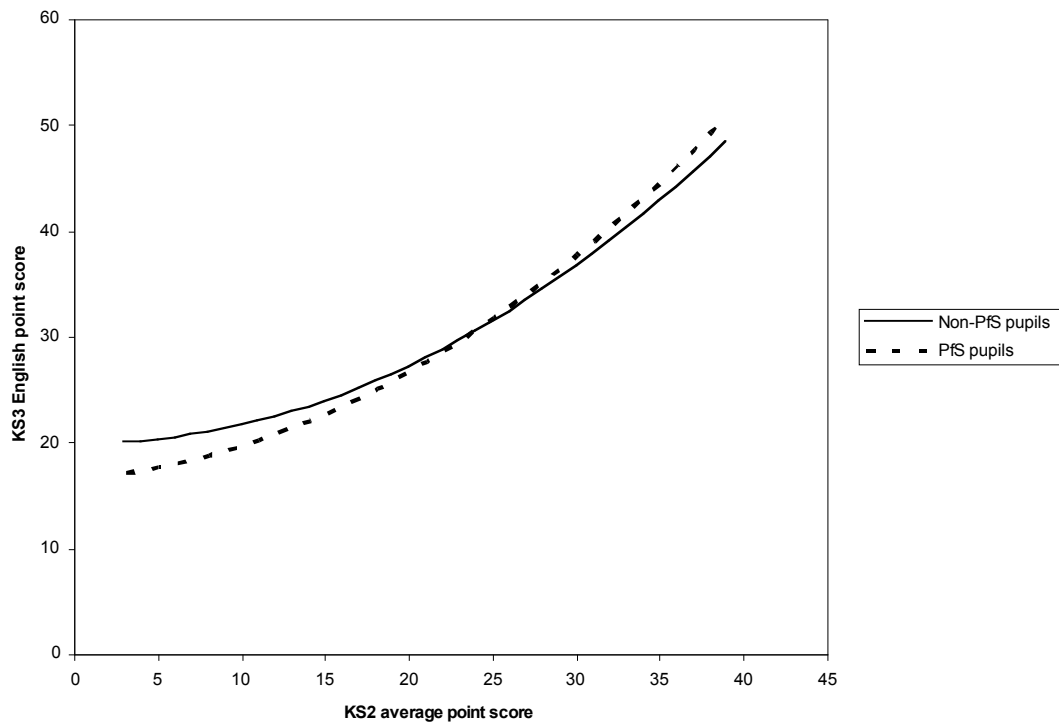
Note that most pupils attained 27 points (equivalent to Level 4 or above) in their average points score at KS2, which means that the impact of PfS on English attainment was positive for most pupils.

In contrast with the results at KS2, this analysis indicates a positive relationship between prior attainment in English and KS3 attainment for pupils attending PfS. Figure 3 shows that pupils who had higher attainment at KS2 and attended PfS Centres did better than expected in their KS3 English assessments, whereas lower attaining pupils did less well, taking into account their background characteristics.

4.2.1 Impact of PfS on lower attaining pupils at KS3

The curvilinear relationship between attendance at PfS and attainment raises the question of whether PfS is likely to have a differential impact on the performance of lower attaining pupils: an important consideration for an initiative wishing to raise the performance of lower-attaining pupils. To investigate this, the multilevel models were rerun excluding all pupils with KS2 average Levels of 4 or above (27 points or

more). Level 4 was chosen as the cut off point because this is the expected attainment Level for KS2 pupils.

Excluding pupils who achieved Level 4 or above at KS2 reduced the total number of cases to 177,183, of whom 162 were PfS pupils. Results are shown in Table 4.

Table 4: Point score gains* for lower attaining PfS pupils at KS3

Outcome	Individual PfS Indicator**	PfS School Indicator	PfS Prior Attainment Interaction
KS3 average score			
KS3 mathematics score		0.83 (3.3)	
KS3 English score			
KS3 science score		0.88 (3.5)	

*This table shows the significant coefficients (point score gains) for KS3 PfS lower attaining pupils compared with non-PfS lower attaining pupils, and (in brackets) the equivalent months of progress.
**The indicator of individual progress represents the expected impact of PfS at the average prior attainment (22.0 points) for this group of lower attaining pupils.

Bearing in mind the small sample size, this analysis suggests that the progress of most lower attaining pupils attending PfS was in line with expectations (i.e. there is no evidence of an impact of PfS on lower attaining pupils' performance at KS3). The only significant impact of PfS for lower attaining pupils at KS3 is at the school level, for mathematics and science. For example, in PfS schools (those sending some pupils to PfS) all pupils attained on average 0.83 points more in KS3 mathematics than expected (which is equivalent to about 3.3 months' extra progress). For KS3 science, pupils in PfS schools attained on average 0.88 points more than lower attaining pupils in non-PfS schools (equivalent to about 3.5 months' extra progress).

5. Conclusions and implications

This study has provided an interesting opportunity to consider the usefulness of a statistical approach to assessing the longer-term progress of pupils who attended *Playing for Success*. However, it is important to emphasise the exploratory nature of the study and to highlight its main limitations. First, relatively small numbers of pupils were involved (especially at KS3). Second, the pupils included in the analysis were not entirely representative of pupils attending the Centres as a whole. Third, the

study is limited by the variables included in the multilevel model: it is possible that other factors, such as the criteria used to select pupils for attendance at PfS (including behaviour and attendance) or school management and ethos, were reflected in the findings. For these reasons, the results of this study should be treated with caution.

The pattern of outcomes would seem to be different at the two key stages. At KS2, there is an association between attendance at PfS and less progress than expected in average KS2 score and mathematics. This is equivalent to about one month's less progress in average score and just under two months' less progress in mathematics. There is however an indication of a small, but significant association between attendance at PfS and positive outcomes in National Curriculum Assessment results for low attaining pupils only (equivalent to one month more progress in average KS2 score). There is little evidence of impact at school level.

At KS3, there is a positive association between attendance at PfS and National Curriculum Assessment (average score and English) for all students. This is equivalent to between two and three months' greater progress. There is also a positive association between attendance at PfS and attainment at school level (in mathematics and science). This is equivalent to about three months' greater progress for pupils in 'PfS schools' (i.e. schools sending some of their pupils to PfS Centres). In contrast with the KS2 results, it was the PfS pupils with (relatively) high prior attainment who appeared to have made greater progress during KS3. However, we should be particularly cautious about interpreting these results because of the low numbers of KS3 pupils included in the analysis.

So what inferences can we draw from this study? First it is important to consider what might be expected. *Playing for Success* is a relatively short intervention, amounting to only about 20 hours during a three- or four-year period of a young person's educational career (see Sharp *et al.*, 2002). Previous national evaluation studies have demonstrated an impact on attainment during their attendance at PfS; but is it reasonable to expect any evidence of impact months or even years later? There are so many possible influences on pupils' performance, apart from their participation in a particular educational initiative. It is also likely that the longer-term impact of PfS will vary according to the extent to which the attitudes and skills young people

have learned at the Centres are supported and developed by their subsequent educational experiences in school.

Nevertheless, this exploratory study has suggested that there may be a small effect (of around one or two months of progress) of PfS on pupil attainment after they had left the Centres. It has indicated that the effect may differ for primary and secondary-age pupils, for different subjects and for pupils with different levels of attainment. There is also some evidence of a small positive effect on whole school performance for schools participating in PfS. The time of attendance (in relation to the time of the Key Stage Assessment) does not appear to influence the outcome. However, this may be because there is insufficient variation in the amount of time that had elapsed between a pupil's attendance at the Centre and their assessment (for example, most KS2 pupils attended in Year 6). This means that we are not able to draw any inferences about the 'best time' for pupils to attend.

Although these findings are tentative, they do point to the potential usefulness of this approach as part of a national evaluation strategy for *Playing for Success*. The main reason for the small sample size was that the study was attempting to gather information in retrospect. If there were a system for Centres to identify pupils as they attend PfS (for example, by collecting the Unique Pupil Numbers as pupils attend the Centres and sending this information to a central database) then the ability to lend power to these calculations would be enhanced, as would the possibility of understanding the complex relationships between attendance at PfS and subsequent performance. This is in keeping with the principle that data should be collected once and used many times. We therefore end this report by recommending that the DfES, in partnership with the Centres, consider developing such a system in the future.

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Appendix: initial analysis and variables used in multilevel modelling

This appendix contains technical information on three areas of the analysis: an initial investigation of the progress of pupils attending PfS; the variables included in the multilevel modelling; and the conversion of National Curriculum Assessment Levels into points and months of progress.

A1 Initial investigation of the progress achieved by PfS pupils

The first step in considering the progress achieved by PfS pupils was to show their progress graphically, in relation to their scores at KS1 and KS2. Figure A1 shows the average attainment (measured as average Level over the three core subjects) for PfS pupils in 2002. Levels could range from 0 to 3 at KS1 and from 0 to 6 at KS2.

In order to provide a comparison with other pupils, percentile values were estimated for all Year 6 pupils in the same PfS schools, based on their attainment at KS1. The reason for making comparisons with other pupils in the same schools is to remove the influence of school-level factors (e.g. percentage of pupils eligible for free school meals) on attainment.

These were smoothed and plotted as lines on a graph of KS2 outcome versus KS1, In Figure 2, circles were used to indicate girls, and triangles to indicate boys. Where more than one pupil attained the same levels, this is indicated by darker symbols.

Figure A1: KS2 versus KS1 average levels achieved by PfS pupils in Year 6, 2002 (compared with percentiles based on non-PfS pupils' attainment)
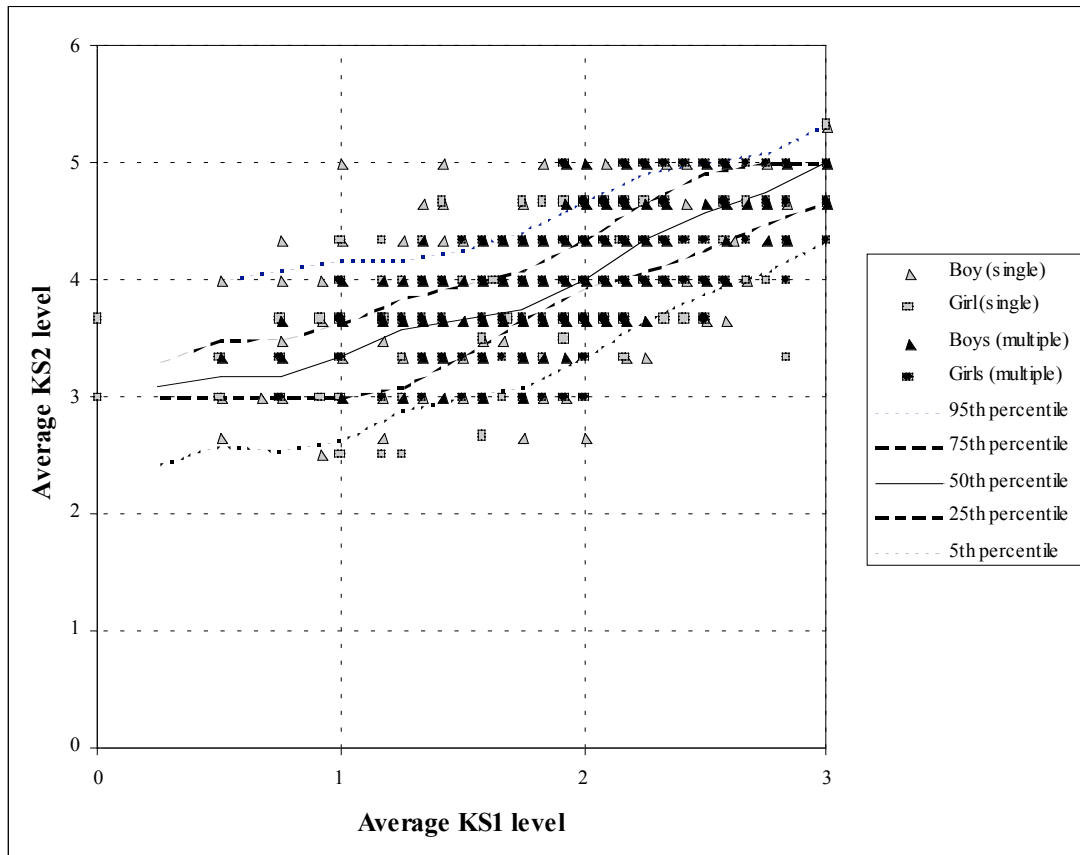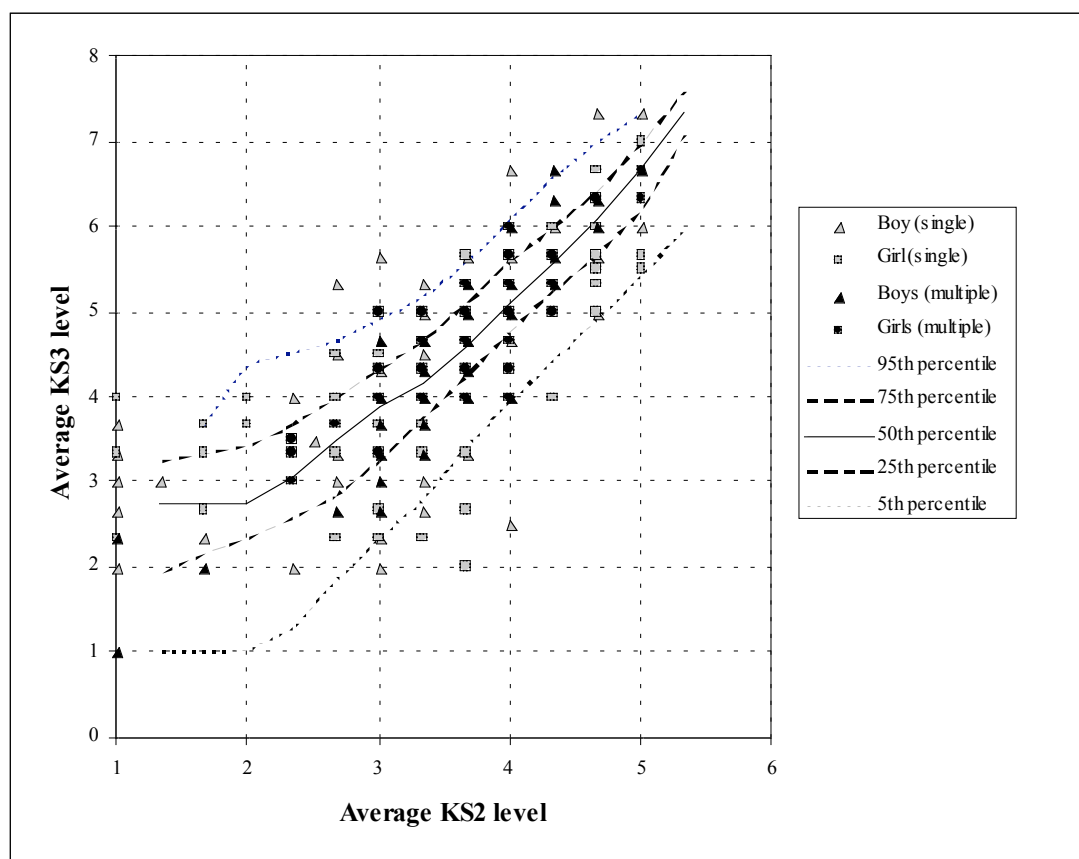

This Figure shows the results obtained by 828 pupils in KS2 who attended PfS Centres, compared with the performance of non-PfS pupils in the same schools

Figure A1 shows that PfS pupils were making about the same amount of progress as others attending the same schools. The percentile lines indicate the progress of the cohort of pupils who attended the same schools but did not attend PfS. About 90 per cent of the PfS pupils' scores lie between the 5 percentile and 95 percentile lines, with small numbers above and below. This indicates that a small number of PfS pupils made less progress than expected during KS2, but small numbers made progress well above what might be expected, compared with their classmates. Scatterplots for each of the subjects (mathematics, English and science) showed a similar pattern of results at KS2.

We used a similar approach to investigate the KS3 data. Figure A2 shows the average attainment (measured as average Level over the three core subjects) for PfS pupils in 2002. Levels could range from 0 to 6 at KS2 and from 0 to 8 at KS3.

In order to provide a comparison with other pupils, percentile values were estimated for all Year 9 pupils in the same PfS schools, based on their attainment at KS1. These were smoothed and plotted as lines on a graph of KS3 outcome versus KS2. Circles were used to indicate girls, and triangles to indicate boys. Where more than one pupil had the same values, this is indicated by darker symbols.

Figure A2: KS3 versus KS2 average Levels achieved by PfS pupils in Year 9, 2002 (compared with percentiles based on non-PfS pupils' attainment)

This Figure shows the results obtained by 284 pupils in KS3 who attended PfS Centres, compared with the performance of non-PfS pupils in the same schools

Figure A2 shows that PfS pupils were making about the same amount of progress as others attending the same schools. The percentile lines indicate the progress of the cohort of pupils who attended the same schools but did not attend PfS. About 90 per cent of the PfS pupils' scores lie between the 5 percentile and 95 percentile lines, with small numbers above and below. This indicates that a small number of PfS pupils made less progress than expected during KS3, but small numbers made progress well

above what might be expected, compared with their classmates. Scatterplots for each of the subjects (mathematics, English and science) showed a similar pattern of results at KS3.

A2 Variables used in multilevel modelling

Table A2.1 shows the variables included in the analysis of the PfS data at KS2[1].

Variable No.	Variable Name	Range		Description
		Min.	Max.	
1	LEA	202	938	LEA reference number
2	ESTAB	2000	7510	School reference number
3	PUPID	1	543688	Pupil reference number
4	CONS	1	1	Constant term
5	INPFW	0	1	Pupil attended PfS
6	PFSSCH	0	1	School involved in PfS
7	PFSINT	-12	6	Interaction PfS/KS2
8	KS2ENGSC	9	39	KS2 English point score
9	KS2MASC	9	39	KS2 Maths point score
10	KS2SCISC	9	39	KS2 Science point score
11	KS1AV	3	26	KS1 average point score
12	KS1RSC	3	27	KS1 Reading point score
13	KS1WRISC	3	27	KS1 writing point score
14	KS1SPSC	4	25	KS1 spelling point score
15	KS1MASC	3	27	KS1 maths point score
16	KS1SCISC	3	27	KS1 science point score
17	KS1AVSQ	0	138	KS2 average score deviation squared
18	SEX	0	1	Sex of pupil
19	SEN1	0	1	SEN – No identified SEN (N)
20	SEN2	0	1	SEN – School action (A)
21	SEN3	0	1	SEN – School action plus (P)
22	SEN4	0	1	SEN – School action plus and statutory assessment (Q)
23	SEN5	0	1	SEN - statement (S)

[1] The models adopted for the two Key Stages were not identical. The models were based on models used in previous NFER studies. For example the model for progress at primary level did not include a variable related to the percentage of children in the school with special educational needs or of pupils with English as an additional language because for primary schools these have been shown not to be significantly related to progress from KS1 to KS2 once other factors (including pupil-level ethnicity, English language proficiency and special educational needs status) are taken into account. The situation is different in secondary schools, where there is evidence of a relationship between these school factors and progress from KS2 to KS3.

24	WHIT	0	1	Pupil from a White ethnic background
25	BLACKC	0	1	Pupil from a Black Caribbean ethnic background
26	BLACKA	0	1	Pupil from a Black African ethnic background
27	BLACKO	0	1	Pupil from a Black (other) ethnic background
28	INDIAN	0	1	Pupil from an Indian ethnic background
29	PAKIST	0	1	Pupil from a Pakistani ethnic background
30	BANGLA	0	1	Pupil from a Bangladeshi ethnic background
31	CHINESE	0	1	Pupil from a Chinese ethnic background
32	OTHER	0	1	Pupil from another ethnic background
33	ETHNOT	0	1	Pupil's ethnicity not given
34	FSM	0	1	Pupil is eligible for free school meals
35	FSMMISS	0	1	Missing data on eligibility for free school meals
36	EAL	0	1	Pupil has English as additional language
37	PUPSTAB	0	1	Pupil has been in this school since Yr 3
38	PCFSM	0	100	% of pupils eligible for free school meals in the school 2002
39	FSMSQ	0	100	% of pupils eligible for free school meals in the school 2002 squared (/100)
40	SIZE	0	23	Size of Yr 6 (/10)
41	SIZESQ	0	280	Size of Yr 6 squared term
42	KS2AV	9	39	KS2 average score

Table A2.2 shows the variables included in the analysis of the PfS data at KS3[2].

Table A2.2 Variables included in the analysis of progress between KS2 and KS3				
		Range		
Variable No.	**Variable Name**	**Min.**	**Max.**	**Description**
1	LEA	202	938	LEA reference number
2	ESTAB	4000	5901	School reference number
3	PUPID	1	509835	Pupil reference number
4	CONS	1	1	Constant term
5	INPFW	0	1	Pupil attended PfS
6	PFSSCH	0	1	School involved in PfS
7	PFSINT	-18	6	Interaction PfS/KS2
8	KS3ENGSC	9	57	KS3 English score
9	KS3MASC	9	57	KS3 maths score
10	KS3SCISC	9	57	KS3 science score
11	KS3AV	9	57	KS3 average score
12	KS2ENGSC	9	41	KS2 maths score
13	KS2MASC	9	41	KS2 English score
14	KS2SCISC	9	40	KS2 science score
15	KS2AV	9	39	KS2 average score
16	KS2AVSQ	0	315	KS2 average score deviation squared
17	SEX	0	1	Sex of pupil
18	SEN1	0	1	SEN – No identified SEN (N)
19	SEN2	0	1	SEN – School action (A)
20	SEN3	0	1	SEN – School action plus (P)
21	SEN4	0	1	SEN – School action plus and statutory assessment (Q)
22	SEN5	0	1	SEN - statement (S)
23	WHIT	0	1	Pupil from a White ethnic background
24	BLACKC	0	1	Pupil from a Black Caribbean ethnic background
25	BLACKA	0	1	Pupil from a Black African ethnic background
26	BLACKO	0	1	Pupil from a Black (other) ethnic background
27	INDIAN	0	1	Pupil from an Indian ethnic background

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[2] The models adopted for the two Key Stages were not identical. The models were based on models used in previous NFER studies. For example the model for progress at primary level did not include a variable related to the percentage of children in the school with special educational needs or of pupils with English as an additional language because for primary schools these have been shown not to be significantly related to progress from KS1 to KS2 once other factors (including pupil-level ethnicity, English language proficiency and special educational needs status) are taken into account. The situation is different in secondary schools, where there is evidence of a relationship between these school factors and progress from KS2 to KS3.

28	PAKIST	0	1	Pupil from a Pakistani ethnic background
29	BANGLA	0	1	Pupil from a Bangladeshi ethnic background
30	CHINESE	0	1	Pupil from a Chinese ethnic background
31	OTHER	0	1	Pupil from an other ethnic background
32	ETHNOT	0	1	Pupil's ethnicity not given
33	FSM	0	1	Pupil is eligible for free school meals
34	FSMMISS	0	1	Missing data on eligibility for free school meals
35	EAL	0	1	Pupil has English as additional language
36	PUPSTAB	0	1	Pupil has been in this school since Yr 7
37	PCFSM	0	84.9	% of pupils eligible for free school meals in the school 2002
38	FSMSQ	0	72	% of pupils eligible for free school meals in the school 2002 squared (/100)
39	PCEAL	0	100	% of pupils in school with English as an additional language
40	PCSEN	0	72	% of pupils in school with identified SEN
41	GRAMMAR	0	1	Grammar school
42	GRAMINT	-18	10	Grammar school/KS2 interaction
43	PCSEL	0	41.92	% of pupils attending grammar schools in LEA
44	SPEC	0	1	Specialist school
45	LANG	0	1	Language college
46	ARTS	0	1	Arts college
47	SPORTS	0	1	Sports college
48	FAITH	0	1	Faith school
49	CATH	0	1	Catholic school
50	JEW	0	1	Jewish school
51	OTHERREL	0	1	School of other religion
52	OTHERC	0	1	Other Christian school
53	BEACON	0	1	Beacon school
54	INEAZ	0	1	School is in an Education Action Zone
55	PCSTAB	0	100	% of pupils in the same school throughout KS3
56	BOYSCH	0	1	Single-sex school – boys
57	GIRLSCH	0	1	Single-sex school – girls

A3 Method used to convert Levels to point scores and months of progress

The DfES has a system to convert Levels derived from National Curriculum tests into point scores (DfES, 2004). This system has been adopted for the current study and is shown in Table A3.

Table A3 Point score equivalent for National Curriculum Assessment Levels

Level or grade	Point score equivalent
W	3
1	9
2C	13
2B	15
2A	17
2 (undifferentiated)	15
3C	19
3B	21
3A	23
4	27
5	33
6	39
7	45
8	51

When considering progress from one Level to another, it may be helpful to consider converting progress in points scores into to nominal 'months of progress'. This may be done by using the assumption underlying the National Curriculum that pupils would complete a Level in approximately two years (24 months). One Level is equivalent to six points, so each point of improvement is equivalent to approximately four months of progress.