Independent Evaluation of the National Tutoring Programme Year 3: Impact Evaluation

Technical Appendix

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Technical Appendix

This appendix provides further detail regarding the methodology undertaken as part of the independent impact evaluation of the National Tutoring Programme Year 3. All analysis described in this appendix was carried out in the Secure Research Service, part of the Office for National Statistics. This work contains statistical data from ONS which is Crown Copyright. The use of the ONS statistical data in this work does not imply the endorsement of the ONS in relation to the interpretation or analysis of the statistical data. This work uses research datasets which may not exactly reproduce National Statistics aggregates.

This research report was written before the new UK Government took office on 5 July 2024. As a result, the content may not reflect current Government policy.

Appendix A: Data sources

Data source	Analytical use
Summer 2023 School census	This table was made available by the DfE data sharing team to provide pupil characteristics (gender, ethnicity, language, SEN, FSM, IDACI). This allowed us to define our analysis populations (including the PP and/or PLA subgroup) and to account for outcome bias associated with these characteristics. In addition, data on pupil participation in the SLT route of the NTP appear in census data for the 2022/23 academic year.
KS2 2022/23 Attainment Data	This table was made available by the DfE data sharing team to provide outcome variables (maths and reading KS2 scores), baseline variables (maths and reading KS1 scores) and allow us to define pupils for the PP and/or PLA subgroup analyses.
KS4 2022/23 Attainment Data	Similarly to the KS2 data, this was made available by the DfE data sharing team to provide outcome variables (maths and English language GCSE points), baseline variables (maths and reading KS2 scores) allow us to define PLA for the PP and/or PLA subgroup analyses.
Get Information About Schools (GIAS)	An extract of GIAS was uploaded into the SRS to allow school level characteristics (Ofsted rating, establishment type, region, urban/rural) so that it could be used for statistical matching.

Appendix B: Methodology

Data preparation

KS2 population analysis

The school census data was reduced to only include pupils in year 6 during the 2022/23 academic year.

From the KS2 data, the following variables were matched into the census subset using the pupil matching reference (PMR): the scaled scores in maths and reading, the KS1 points scores for reading and maths, and the KS1 prior attainment group. A flag was created to identify pupils in the PP and/or PLA subgroup as those in the 'Low' group for prior attainment or those who had ever been recorded as eligible for free school meals (FSM) in the last 6 years (or both).

The pupil-level analysis was restricted to pupils who were selected for the NTP in Year 2. The intervention group was defined as pupils who were selected for tutoring in both Year 2 and Year 3 of the NTP. The comparison group was defined as pupils who were selected for tutoring in Year 2 of the NTP but did not receive tutoring in Year 3 because their school did not take part in the NTP. Pupils who were selected for tutoring in Year 2 but did not receive tutoring in Year 3 (even though their school was taking part in the NTP in Year 3) were excluded from the main pupil-level analysis but were included as the comparison group in the pupil-level sensitivity analysis.

The school level data set was also reduced to only include schools with year 6 pupils. The following variables were calculated from the school census: proportion of PP pupils, proportion of EAL pupils, proportion of SEN pupils, number of year 6 pupils, number of analysis population year 6 pupils, number of analysis population pupils selected for NTP numeracy tuition, number of analysis population pupils selected for NTP literacy tuition. From these variables, the school-level intervention groups were defined.

Intervention schools were defined as those who had taken part in the NTP in Year 3, with a minimum participation level of 54% of all pupils. This participation level was derived from a data-driven approach that sought to maximise the statistical power of the analysis (see section 'Minimum participation level derivation' below for detail on how this was derived). Schools that had taken part in the NTP in Year 3 but with a participation level less than 54% were excluded from the analysis. Control schools were defined as those who had not taken part in the NTP in Year 3.

KS4 population analysis

Data preparation for the KS4 analysis followed a similar procedure to the KS2 data. The only differences were:

- KS4 attainment data was used instead of KS2 attainment data: GCSE maths points, GCSE English language points, prior KS2 maths score, prior KS2 reading score.

- Year 11 pupils were used.

- The minimum participation level for the school-level analysis was 64%. See section 'minimum participation level derivation' below for detail on how this level was derived.

Minimum participation level derivation

An important consideration for the school-level analysis was to define the optimum minimum participation rate for intervention schools, in order to maximise statistical power of the analysis. A data-driven approach was taken to derive this, which is described below.

For each of the four key stage/subject combinations (KS2 maths, KS2 English, KS4 maths, KS4 English), we explored a range of minimum participation levels to define intervention schools: from 0% to 75% of pupils, in 5% increment levels. Schools that had participated in the NTP but at a level less than this threshold were excluded from the analysis. In each instance, schools that had not participated in the NTP at all formed the control group.

Data from pupils from these intervention and control schools was then used to calculate pre-post correlation and unconditional intra-cluster correlation coefficient (ICC) parameters. The ICC was calculated using a multi-level regression model with primary outcome of interest (i.e. KS2 maths score, etc.) and no covariates. These two parameters were then used to derive the minimum detectable effect size (MDES) for that minimum participation level for power = 80%, using the PowerUpR package within R.

To account for dilution, these MDES values were corrected by dividing them by the mean number of pupils that had received NTP tutoring for that participation level. The minimum corrected MDES indicated the optimum minimum participation level, to the nearest 5%.

The analysis was then repeated at a more granular level, i.e. in 1% increments five percentage points above and below the optimum minimum participation level obtained from the first analysis.

From this, minimum participation levels were initially considered separately for each of the four groups. Whilst the same minimum participation level was identified for both maths and English in Key Stage 4 (64%), different levels were identified for Key Stage 2 (54% and 50% for maths and English, respectively). However, the difference between the

corrected MDES values for these two participation levels was negligible (less than 0.001), Therefore, in order to simplify the analysis we decided to use the KS2 maths minimum participation level across both subjects (54%).

School level matching

For each school-level analysis including the main analyses (all pupils, PP pupils and PLA pupils), and all subgroup analyses, separate matches were conducted at KS2 and at KS4. For each match common support was first enforced in all matching variables. All matches were then conducted using entropy balancing (Hainmueller, 2012), balancing the mean of each variable between schools in the intervention and comparison groups. The variables included in entropy balancing were the following school-level variables:

- Whether school is urban or rural

- Government region

- Proportion of PP pupils at the school

- Proportion of SEN pupils at the school

- Proportion of EAL pupils at the school

- Number of pupils in Year 6/Year 11

- Proportion of pupils achieving, respectively, levels 0-4, 6, 8 and 10 in KS1, or average KS2 score for both reading and maths

- School type

- Ofsted rating

Weights for comparison schools were estimated at a school level in the matching, then included in regression modelling. Matching was undertaken using the WeightIt package in R (Greifer, 2024). Balance after matching is shown in Appendix C, for the KS2 and KS4 main analyses.

Pupil level matching

Prior to each match the sample was restricted to those pupils who participated in the NTP for Year 2. Matches were conducted for: all pupils, PP pupils, PLA pupils and the all-pupil sensitivity analysis. Separate matches were obtained for each of these groups in KS2 and KS4 maths and English. Again, for each match common support was first enforced in all matching variables. All matches were conducted using entropy balancing, balancing the mean of each variable between pupils in the intervention and comparison groups. The variables included in the entropy balancing were a mixture of pupil- and school-level variables:

School-level variables:

- Whether school is urban or rural

- Government region

- Proportion of PP pupils at the school

- Proportion of SEN pupils at the school

- Proportion of EAL pupils at the school

- Number of pupils in Year 6/Year 11

- Proportion of pupils achieving, respectively, levels 0-4, 6, 8 and 10 in KS1, or average KS2 score for both reading and maths

- School type

- Ofsted rating

Pupil-level variables

- Number of absences in the corresponding school year (year 6 or 11)

- Gender

- Whether pupil speaks EAL

- PP eligibility

- SEN status

- Whether pupil's ethnicity is White British

- Pupil's baseline score (KS1 or KS2, maths or reading, as appropriate)

- IDACI quintile

Weights for comparison schools were estimated at a pupil level in the matching, then included in regression modelling. Matching was again undertaken using the WeightIt package in R (Greifer, 2024). Balance after matching for each of the matches is shown in Appendix C for KS2 and KS4.

Statistical analyses

Main analysis

For the main statistical analysis, the pupil- and school-level analyses were performed using linear mixed effects regression models to analyse the impact of the NTP on English and maths outcomes at school level and pupil level for KS2 and KS4. For the pupil level analyses, four groups of pupils were considered (all pupils, PP pupils, PLA pupils and an all pupils sensitivity analysis). For the school-level analyses, three groups of pupils were considered (all pupils, PP pupils and PLA pupils). In all models, school was treated as a random effect and all other variables included as fixed effects. Covariates included in both pupil- and school-level models were all the variables described in the pupil and school-level matching sections above. Weights were taken from the entropy balancing and applied at a pupil or school level as appropriate. All mixed effects models were calculated using the lme4 package in R (Bates et al., 2015). Significance testing of the intervention group coefficient at a 5% significance threshold via Satterthwaite's degrees of freedom method was performed using the package (Kuznetsova et al., 2020).

Dosage analysis

For the dosage analysis a modelling approach was taken to determine the best school-level outcome (i.e., is it better to give fewer hours of tutoring to more pupils or more hours to fewer pupils). The models used the average number of tutoring hours amongst pupils who received the NTP as the main predictor, with covariates[1] in the model including each school's average number of tutoring hours amongst **all** pupils. When the 'average NTP hours amongst NTP pupils' predictor increases, this equates to giving fewer pupils more hours of tutoring, and vice versa.

We anticipated that the relationship between average number of tutoring hours amongst NTP pupils and the outcome could be nonlinear and have a maximum, which would correspond to the optimum number of hours per tutored pupil. Accordingly, the analysis explored polynomial models across both Key Stages and subjects. We continued adding polynomial terms[2] until the most recently added term was not statistically significant (p>0.05). We then removed that term and took the penultimate model as our solution. The linear and quadratic models explored in this way are summarised in Table 1 (in practice cubic and higher order terms were not required). The results described in the main report are from models restricted to schools with an 'average NTP hours amongst all pupils' between 0 and 40. As a sensitivity analysis we excluded further schools with very high or low 'average NTP hours amongst all pupils' by restricting to schools where

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[1] Covariate adjustment is used to account for potential confounders (e.g. proportion of PP pupils), but not matching, which makes these dosage results less reliable than the main school-level analysis in that regard. There also remains some potential for bias due to unobserved confounders, although we judge this risk to be relatively low, as the predictor of interest is measured at a school rather than pupil level.

[2] That is, starting with 'average NTP hours amongst NTP pupils', then adding this number squared to the model, and so on.

this value was between 1 and 10. Both the main and sensitivity models are shown in Table 1.

Table 1: Linear and quadratic models exploring the impact of average NTP hours amongst NTP pupils (focusing more hours on fewer pupils) on KS2 and KS4 attainment

Outcome	Average NTP hours amongst all pupils*	Linear model: linear term p value	Quadratic model: linear term p value	Quadratic model: quadratic term p value
KS2 maths score	0< and <40	0.002	<0.001	<0.001
KS2 maths score	1< and <10	<0.001	<0.001	0.039
KS2 reading score	0< and <40	<0.001	<0.001	0.013
KS2 reading score	1< and <10	<0.001	<0.001	0.158
GCSE maths grade	0< and <40	0.650	N/A	N/A
GCSE maths grade	1< and <10	0.933	N/A	N/A
GCSE English Language grade	0< and <40	0.906	N/A	N/A
GCSE English Language grade	1< and <10	0.836	N/A	N/A

At KS2 the data supported a quadratic relationship between 'average NTP hours amongst NTP pupils' and attainment. The maximum point on the resulting quadratic curves indicated the optimum way of spreading tutoring among pupils (these curves are plotted in the main report). At KS4 none of the linear models indicated any relationship between 'average NTP hours amongst NTP pupils' and attainment, so no further results are shown. The sensitivity dosage results (1-10 hours) generally agreed with the main dosage results (0-40 hours), although it was less clear at KS2 whether the sensitivity data supported a quadratic model. The curves produced by the quadratic sensitivity models were similar to those in the corresponding main dosage models, reaching a maximum at ta similar point.

Subgroup Analyses

To investigate any differences in the impact of the NTP at school level based on pupil characteristics (sex, SEN status, EAL status, IDACI quintile, region and ethnicity), the school-level mixed effects regression models were repeated for each of the subgroups (e.g., female pupils). In each instance, the matching process was first carried out (using the same methodology as that outlined for the main analysis) in order to generate subgroup-specific weights to use in the regression models.

Long-term analysis

This analysis used the same population of pupils (i.e., pupils who were in Year 6 or Year 11 in the 2022/23 academic year) and analysis approach as the main impact analysis, considering the impact on KS2/KS4 attainment in maths and reading/English literature separately. However, this analysis considered whether their school had participated in the NTP in Year 2 (2021/22), rather than participation in the NTP in Year 3 (2022/23). As the Year 2 NTP data includes information about which NTP route pupils participated in, we were able to carry out analyses individually for NTP route as well as subject and year group. However, only a small number of schools participated in the Academic Mentors (AM) route in Year 2. The AM route was therefore combined with the School-Led Tutoring (SLT) route for this analysis, as these routes were felt to be the most similar in terms of tutoring delivery. Combining AM with SLT in this way sought to increase the statistical power of these analyses. Again, we used a data driven approach to select the optimum percentage participation threshold for schools to be included in the intervention group. For KS2, only schools with a minimum participation rate of 34% for AM/SLT or TP (as applicable) were included in the analysis. For KS4, only schools with a minimum participation rate of 27% were included for AM/SLT and 6% for TP (very few schools which offered TP to KS4 pupils had a high percentage of pupils taking part in this route). The method used to determine these minimum participation levels was the same as that used for the main analysis and is detailed in the 'minimum participation level derivation' section above.

The comparison group differed for each model and was defined as schools that did not use the route(s) of interest, with tuition by the other route(s) controlled for within the model. Otherwise, all other aspects of the modelling (outcomes, covariates, types of model, package used to run the analysis) were as those used in the main analysis.

Appendix C: Matching balance tables

Table 2: Balance of characteristics before and after matching for all NTP routes in the KS2 school-level analysis (all pupils)

Variable	Level	Intervention group	Comparison group (unweighted)	Comparison group (weighted)
School % PP pupils	Mean	0.35	0.25	0.35
School % SEN pupils	Mean	0.21	0.2	0.21
School % EAL pupils	Mean	0.2	0.15	0.2
School Number of pupils in Year 6	Mean	37.99	33.93	37.99
School Proportion of pupils achieving Levels 0-4 at KS1 for reading	Mean	0.06	0.05	0.06
School Proportion of pupils achieving Level 6 at KS1 for reading	Mean	0.19	0.17	0.19
School Proportion of pupils achieving Levels 8 at KS1 for reading	Mean	0.52	0.52	0.52
School Proportion of pupils achieving Levels 10 at KS1 for reading	Mean	0.22	0.26	0.22

Variable	Level	Intervention group	Comparison group (unweighted)	Comparison group (weighted)
School Proportion of pupils achieving Levels 0-4 at KS1 for maths	Mean	0.05	0.04	0.05
School Proportion of pupils achieving Level 6 at KS1 for maths	Mean	0.2	0.18	0.2
School Proportion of pupils achieving Levels 8 at KS1 for maths	Mean	0.56	0.56	0.56
School Proportion of pupils achieving Levels 10 at KS1 for maths	Mean	0.2	0.22	0.2
School type	Academies	46% (1470)	36% (1922)	46% (2467)
School type	Free Schools	1% (38)	2% (96)	1% (64)
School type	Local authority maintained schools	52% (1682)	61% (3297)	52% (2823)
School type	Special schools	0% (14)	1% (62)	0% (24)
School Ofsted rating	Good	67% (2144)	67% (3627)	67% (3598)
School Ofsted rating	Missing	15% (493)	14% (772)	15% (828)
School Ofsted rating	Outstanding	9% (276)	11% (607)	9% (463)

Variable	Level	Intervention group	Comparison group (unweighted)	Comparison group (weighted)
School Ofsted rating	Requires improvement	9% (276)	6% (341)	9% (463)
School Ofsted rating	Serious Weaknesses	0% (6)	0% (15)	0% (10)
School Ofsted rating	Special Measures	0% (9)	0% (15)	0% (15)
School region	East Midlands	10% (327)	9% (496)	10% (549)
School region	East of England	11% (345)	12% (640)	11% (579)
School region	London	12% (388)	9% (492)	12% (651)
School region	North East	7% (211)	6% (317)	7% (354)
School region	North West	17% (540)	15% (821)	17% (906)
School region	South East	10% (321)	16% (859)	10% (539)
School region	South West	10% (324)	12% (644)	10% (544)
School region	West Midlands	11% (340)	10% (539)	11% (571)
School region	Yorkshire and the Humber	13% (408)	11% (569)	13% (685)
School Urban or rural	Rural	22% (712)	37% (1983)	22% (1195)
School Urban or rural	Urban	78% (2492)	63% (3394)	78% (4182)
Total N schools		3204	5377	5377
Total N pupils		768228	1183736	1183736

Table 3: Balance of characteristics before and after matching for all NTP routes in the KS2 school-level analysis (PP pupils)

Variable	Level	Intervention group	Comparison group (unweighted)	Comparison group (weighted)
School % PP pupils	Mean	0.29	0.25	0.29
School % SEN pupils	Mean	0.19	0.19	0.19

Variable	Level	Intervention group	Comparison group (unweighted)	Comparison group (weighted)
School % EAL pupils	Mean	0.19	0.16	0.19
School Number of pupils in Year 6	Mean	39.86	35.49	39.86
School Proportion of pupils achieving Levels 0-4 at KS1 for reading	Mean	0.05	0.05	0.05
School Proportion of pupils achieving Level 6 at KS1 for reading	Mean	0.18	0.17	0.18
School Proportion of pupils achieving Levels 8 at KS1 for reading	Mean	0.52	0.52	0.52
School Proportion of pupils achieving Levels 10 at KS1 for reading	Mean	0.25	0.26	0.25
School Proportion of pupils achieving Levels 0-4 at KS1 for maths	Mean	0.04	0.04	0.04

Variable	Level	Intervention group	Comparison group (unweighted)	Comparison group (weighted)
School Proportion of pupils achieving Level 6 at KS1 for maths	Mean	0.18	0.18	0.18
School Proportion of pupils achieving Levels 8 at KS1 for maths	Mean	0.56	0.56	0.56
School Proportion of pupils achieving Levels 10 at KS1 for maths	Mean	0.21	0.22	0.21
School type	Academies	43% (2422)	36% (1971)	43% (2336)
School type	Free Schools	1% (76)	2% (90)	1% (73)
School type	Local authority maintained schools	55% (3089)	61% (3295)	55% (2978)
School type	Special schools	0% (14)	1% (45)	0% (14)
School Ofsted rating	Good	66% (3722)	67% (3636)	66% (3589)
School Ofsted rating	Missing	15% (857)	14% (777)	15% (827)
School Ofsted rating	Outstanding	11% (599)	11% (618)	11% (578)
School Ofsted rating	Requires improvement	7% (408)	6% (340)	7% (394)
School Ofsted rating	Serious Weaknesses	0% (9)	0% (15)	0% (8)
School Ofsted rating	Special Measures	0% (6)	0% (15)	0% (6)

Variable	Level	Intervention group	Comparison group (unweighted)	Comparison group (weighted)
School region	East Midlands	10% (548)	9% (490)	10% (528)
School region	East of England	12% (650)	12% (653)	12% (627)
School region	London	13% (705)	9% (510)	13% (680)
School region	North East	5% (294)	6% (320)	5% (283)
School region	North West	16% (886)	15% (821)	16% (855)
School region	South East	13% (705)	16% (879)	13% (680)
School region	South West	11% (600)	12% (653)	11% (579)
School region	West Midlands	10% (567)	10% (529)	10% (547)
School region	Yorkshire and the Humber	12% (646)	10% (546)	12% (623)
School Urban or rural	Rural	25% (1419)	34% (1842)	25% (1368)
School Urban or rural	Urban	75% (4182)	66% (3559)	75% (4033)
Total N schools		5601	5401	5401
Total N pupils		1393115	1229795	1229795

Table 4: Balance of characteristics before and after matching for all NTP routes in the KS2 school-level analysis (PLA pupils)

Variable	Level	Intervention group	Comparison group (unweighted)	Comparison group (weighted)
School % PP pupils	Mean	0.31	0.24	0.31
School % SEN pupils	Mean	0.19	0.19	0.19
School % EAL pupils	Mean	0.2	0.16	0.2
School Number of pupils in Year 6	Mean	39.35	35.38	39.35

Variable	Level	Intervention group	Comparison group (unweighted)	Comparison group (weighted)
School Proportion of pupils achieving Levels 0-4 at KS1 for reading	Mean	0.05	0.05	0.05
School Proportion of pupils achieving Level 6 at KS1 for reading	Mean	0.18	0.17	0.18
School Proportion of pupils achieving Levels 8 at KS1 for reading	Mean	0.52	0.52	0.52
School Proportion of pupils achieving Levels 10 at KS1 for reading	Mean	0.24	0.26	0.24
School Proportion of pupils achieving Levels 0-4 at KS1 for maths	Mean	0.04	0.04	0.04
School Proportion of pupils achieving Level 6 at KS1 for maths	Mean	0.19	0.18	0.19
School Proportion of pupils achieving Levels 8 at KS1 for maths	Mean	0.56	0.56	0.56

Variable	Level	Intervention group	Comparison group (unweighted)	Comparison group (weighted)
School Proportion of pupils achieving Levels 10 at KS1 for maths	Mean	0.21	0.22	0.21
School type	Academies	43% (2240)	37% (2161)	43% (2507)
School type	Free Schools	1% (58)	2% (100)	1% (65)
School type	Local authority maintained schools	56% (2943)	61% (3567)	56% (3293)
School type	Special schools	0% (15)	1% (54)	0% (17)
School Ofsted rating	Good	66% (3478)	68% (3973)	66% (3892)
School Ofsted rating	Missing	15% (810)	14% (841)	15% (907)
School Ofsted rating	Outstanding	11% (572)	11% (668)	11% (640)
School Ofsted rating	Requires improvement	7% (381)	6% (371)	7% (426)
School Ofsted rating	Serious Weaknesses	0% (6)	0% (17)	0% (7)
School Ofsted rating	Special Measures	0% (9)	0% (12)	0% (10)
School region	East Midlands	10% (523)	9% (556)	10% (585)
School region	East of England	11% (560)	12% (699)	11% (627)
School region	London	14% (726)	9% (554)	14% (812)
School region	North East	5% (281)	6% (348)	5% (315)
School region	North West	17% (880)	15% (900)	17% (985)
School region	South East	11% (590)	16% (962)	11% (660)
School region	South West	10% (551)	12% (680)	10% (617)
School region	West Midlands	10% (533)	10% (586)	10% (596)
School region	Yorkshire and the Humber	12% (612)	10% (597)	12% (685)

Variable	Level	Intervention group	Comparison group (unweighted)	Comparison group (weighted)
School Urban or rural	Rural	24% (1244)	34% (2025)	24% (1392)
School Urban or rural	Urban	76% (4012)	66% (3857)	76% (4490)
Total N schools		5256	5882	5882
Total N pupils		1302962	1336671	1336671

Table 5: Balance of characteristics before and after matching for all NTP routes in the KS4 school-level analysis (all pupils)

Variable	Level	Intervention group	Comparison group (unweighted)	Comparison group (weighted)
School % PP pupils	Mean	0.38	0.38	0.38
School % SEN pupils	Mean	0.24	0.39	0.24
School % EAL pupils	Mean	0.21	0.15	0.21
Number of pupils in Year 1	Mean	138.51	107	138.51
School average KS2 reading score	Mean	103.46	102.78	103.46
School average KS2 maths score	Mean	103.09	102.12	103.09
School type	Academies	71% (596)	58% (534)	71% (654)
School type	Free Schools	9% (76)	10% (89)	9% (83)
School type	Local authority maintained schools	17% (142)	23% (211)	17% (156)
School type	Special schools	3% (24)	9% (86)	3% (26)
School Ofsted rating	Good	56% (468)	58% (530)	56% (514)

Variable	Level	Intervention group	Comparison group (unweighted)	Comparison group (weighted)
School Ofsted rating	Missing	17% (141)	15% (135)	17% (155)
School Ofsted rating	Outstanding	11% (94)	15% (142)	11% (103)
School Ofsted rating	Requires improvement	15% (122)	10% (95)	15% (134)
School Ofsted rating	Serious Weaknesses	1% (6)	1% (8)	1% (7)
School Ofsted rating	Special Measures	1% (7)	1% (10)	1% (8)
School region	East Midlands	7% (62)	8% (77)	7% (68)
School region	East of England	8% (65)	10% (92)	8% (71)
School region	London	20% (165)	14% (128)	20% (181)
School region	North East	7% (55)	5% (42)	7% (60)
School region	North West	15% (128)	14% (127)	15% (140)
School region	South East	10% (85)	18% (169)	10% (93)
School region	South West	8% (66)	11% (97)	8% (72)
School region	West Midlands	13% (105)	11% (100)	13% (115)
School region	Yorkshire and the Humber	13% (107)	10% (88)	13% (117)
School Urban or rural	Rural	8% (69)	13% (121)	8% (76)
School Urban or rural	Urban	92% (769)	87% (799)	92% (844)
Total N schools		838	920	920
Total N pupils		713620	600853	600853

Table 6: Balance of characteristics before and after matching for all NTP routes in the KS4 school-level analysis (all pupils)

Variable	Level	Intervention group	Comparison group (unweighted)	Comparison group (weighted)
School % PP pupils	Mean	0.33	0.36	0.33
School % SEN pupils	Mean	0.22	0.36	0.22
School % EAL pupils	Mean	0.2	0.15	0.2
Number of pupils in Year 1	Mean	147.94	114.17	147.94
School average KS2 reading score	Mean	104.15	103.28	104.15
School average KS2 maths score	Mean	103.65	102.54	103.65
School type	Academies	72% (803)	60% (587)	72% (697)
School type	Free Schools	9% (96)	9% (89)	9% (83)
School type	Local authority maintained schools	18% (200)	22% (219)	18% (174)
School type	Special schools	2% (23)	8% (79)	2% (20)
School Ofsted rating	Good	56% (631)	58% (562)	56% (548)
School Ofsted rating	Missing	17% (190)	15% (143)	17% (165)
School Ofsted rating	Outstanding	13% (148)	16% (151)	13% (128)
School Ofsted rating	Requires improvement	13% (142)	10% (99)	13% (123)
School Ofsted rating	Serious Weaknesses	0% (4)	1% (10)	0% (3)
School Ofsted rating	Special Measures	1% (7)	1% (9)	1% (6)

Variable	Level	Intervention group	Comparison group (unweighted)	Comparison group (weighted)
School region	East Midlands	8% (93)	8% (80)	8% (81)
School region	East of England	9% (104)	10% (97)	9% (90)
School region	London	19% (209)	14% (136)	19% (181)
School region	North East	5% (61)	5% (45)	5% (53)
School region	North West	14% (157)	14% (133)	14% (136)
School region	South East	12% (136)	19% (183)	12% (118)
School region	South West	8% (92)	11% (110)	8% (80)
School region	West Midlands	12% (139)	11% (104)	12% (121)
School region	Yorkshire and the Humber	12% (131)	9% (86)	12% (114)
School Urban or rural	Rural	11% (120)	14% (132)	11% (104)
School Urban or rural	Urban	89% (1002)	86% (842)	89% (870)
Total N schools		1122	974	974
Total N pupils		993500	672220	672220

Table 7: Balance of characteristics before and after matching for all NTP routes in the KS4 school-level analysis (PLA pupils)

Variable	Level	Intervention group	Comparison group (unweighted)	Comparison group (weighted)
School % PP pupils	Mean	0.36	0.37	0.36
School % SEN pupils	Mean	0.23	0.37	0.23
School % EAL pupils	Mean	0.21	0.15	0.21
Number of pupils in Year 1	Mean	140.79	113.42	140.8
School average KS2 reading score	Mean	103.6	102.42	103.6

Variable	Level	Intervention group	Comparison group (unweighted)	Comparison group (weighted)
School average KS2 maths score	Mean	103.15	101.7	103.15
School type	Academies	70% (635)	58% (550)	70% (659)
School type	Free Schools	10% (88)	10% (90)	10% (91)
School type	Local authority maintained schools	18% (160)	23% (220)	18% (166)
School type	Special schools	3% (24)	9% (81)	3% (25)
School Ofsted rating	Good	57% (513)	59% (555)	57% (532)
School Ofsted rating	Missing	16% (146)	15% (140)	16% (151)
School Ofsted rating	Outstanding	12% (113)	14% (128)	12% (117)
School Ofsted rating	Requires improvement	13% (122)	11% (99)	13% (127)
School Ofsted rating	Serious Weaknesses	1% (6)	1% (9)	1% (6)
School Ofsted rating	Special Measures	1% (7)	1% (10)	1% (7)
School region	East Midlands	8% (73)	9% (81)	8% (76)
School region	East of England	7% (67)	10% (90)	7% (70)
School region	London	19% (176)	15% (137)	19% (183)
School region	North East	7% (59)	5% (44)	7% (61)
School region	North West	15% (137)	14% (132)	15% (142)
School region	South East	10% (94)	18% (172)	10% (98)
School region	South West	8% (77)	11% (99)	8% (80)
School region	West Midlands	12% (110)	10% (96)	12% (114)
School region	Yorkshire and the Humber	13% (114)	10% (90)	13% (118)
School Urban or rural	Rural	10% (89)	14% (135)	10% (92)

Variable	Level	Intervention group	Comparison group (unweighted)	Comparison group (weighted)
School Urban or rural	Urban	90% (818)	86% (806)	90% (849)
Total N schools		907	941	941
Total N pupils		777069	645164	645164

Table 8: Balance of characteristics before and after matching for all NTP routes in the KS2 pupil-level analysis (all pupils)

Variable	Level	Intervention group	Comparison group (unweighted)	Comparison group (weighted)
School % PP pupils	Mean	0.34	0.3	0.34
School % SEN pupils	Mean	0.19	0.18	0.19
School % EAL pupils	Mean	0.24	0.22	0.24
School Number of pupils in Year 6	Mean	51.37	49.12	51.37
Pupil Number of absences	Mean	15.71	15.69	15.71
School Proportion of pupils achieving Levels 0-4 at KS1 for reading	Mean	0.06	0.05	0.06
School Proportion of pupils achieving Level 6 at KS1 for reading	Mean	0.18	0.18	0.18
School Proportion of pupils achieving Levels 8 at KS1 for reading	Mean	0.52	0.53	0.52

Variable	Level	Intervention group	Comparison group (unweighted)	Comparison group (weighted)
School Proportion of pupils achieving Levels 10 at KS1 for reading	Mean	0.24	0.24	0.24
School Proportion of pupils achieving Levels 0-4 at KS1 for maths	Mean	0.04	0.04	0.04
School Proportion of pupils achieving Level 6 at KS1 for maths	Mean	0.18	0.18	0.18
School Proportion of pupils achieving Levels 8 at KS1 for maths	Mean	0.56	0.57	0.56
School Proportion of pupils achieving Levels 10 at KS1 for maths	Mean	0.21	0.21	0.21
School type	Academies	43% (25790)	38% (9006)	43% (10079)
School type	Free Schools	1% (715)	2% (444)	1% (279)
School type	Local authority maintained schools	56% (34132)	60% (14245)	56% (13339)
School type	Special schools	0% (23)	0% (13)	0% (10)
School Ofsted rating	Good	67% (40503)	71% (16722)	67% (15829)
School Ofsted rating	Missing	14% (8491)	13% (3135)	14% (3318)
School Ofsted rating	Outstanding	12% (7339)	9% (2044)	12% (2869)

Variable	Level	Intervention group	Comparison group (unweighted)	Comparison group (weighted)
School Ofsted rating	Requires improvement	7% (4180)	7% (1643)	7% (1634)
School Ofsted rating	Serious Weaknesses	0% (56)	0% (104)	0% (21)
School Ofsted rating	Special Measures	0% (91)	0% (60)	0% (37)
School region	East Midlands	9% (5268)	8% (1949)	9% (2059)
School region	East of England	10% (6322)	9% (2228)	10% (2471)
School region	London	16% (9820)	12% (2885)	16% (3838)
School region	North East	5% (3266)	7% (1635)	5% (1276)
School region	North West	16% (9673)	16% (3888)	16% (3780)
School region	South East	11% (6919)	17% (3924)	11% (2704)
School region	South West	9% (5169)	8% (1994)	9% (2020)
School region	West Midlands	12% (7023)	12% (2821)	12% (2745)
School region	Yorkshire and the Humber	12% (7200)	10% (2384)	12% (2814)
School Urban or rural	Rural	13% (8010)	17% (4013)	13% (3131)
School Urban or rural	Urban	87% (52650)	83% (19695)	87% (20577)
Pupil Gender	F	51% (31163)	51% (12034)	51% (12179)
Pupil Gender	M	49% (29497)	49% (11674)	49% (11529)
Pupil speaks EAL	N	80% (48394)	81% (19284)	80% (18915)
Pupil speaks EAL	Y	20% (12266)	19% (4424)	20% (4793)
Pupil is white British	N	34% (20797)	31% (7454)	34% (8128)
Pupil is white British	Y	66% (39863)	69% (16254)	66% (15580)
Pupil has SEN	N	74% (44725)	75% (17897)	74% (17480)
Pupil has SEN	Y	26% (15935)	25% (5811)	26% (6228)

Variable	Level	Intervention group	Comparison group (unweighted)	Comparison group (weighted)
Pupil eligible for PP	N	44% (26881)	52% (12367)	44% (10506)
Pupil eligible for PP	Y	56% (33779)	48% (11341)	56% (13202)
Pupil IDACI quintile	Least deprived 20%	11% (6626)	15% (3529)	11% (2589)
Pupil IDACI quintile	2nd least deprived 20%	15% (9334)	18% (4272)	15% (3648)
Pupil IDACI quintile	Middle 20%	19% (11386)	20% (4801)	19% (4450)
Pupil IDACI quintile	2nd most deprived 20%	24% (14660)	22% (5331)	24% (5730)
Pupil IDACI quintile	Most deprived 20%	31% (18654)	24% (5775)	31% (7291)
Pupil KS1 maths score	0-4	5% (3177)	5% (1146)	5% (1241)
Pupil KS1 maths score	6	30% (18143)	30% (7094)	30% (7091)
Pupil KS1 maths score	8	58% (34889)	57% (13607)	58% (13636)
Pupil KS1 maths score	10	7% (4451)	8% (1861)	7% (1740)
Pupil KS1 reading score	0-4	7% (4372)	7% (1565)	7% (1709)
Pupil KS1 reading score	6	29% (17311)	28% (6694)	29% (6765)
Pupil KS1 reading score	8	55% (33203)	55% (13007)	55% (12976)
Pupil KS1 reading score	10	10% (5774)	10% (2442)	10% (2258)
Total N schools		7253	2778	2778
Total N pupils		60660	23708	23708

Table 9: Balance of characteristics before and after matching for all NTP routes in the KS2 pupil-level analysis (all pupils)

Variable	Level	Intervention group	Comparison group (unweighted)	Comparison group (weighted)
School % PP pupils	Mean	0.38	0.34	0.38
School % SEN pupils	Mean	0.19	0.19	0.19
School % EAL pupils	Mean	0.26	0.24	0.26
School Number of pupils in Year 6	Mean	51.05	48.15	51.05
Pupil Number of absences	Mean	18.31	18.97	18.31
School Proportion of pupils achieving Levels 0-4 at KS1 for reading	Mean	0.06	0.06	0.06
School Proportion of pupils achieving Level 6 at KS1 for reading	Mean	0.18	0.18	0.18
School Proportion of pupils achieving Levels 8 at KS1 for reading	Mean	0.53	0.53	0.53
School Proportion of pupils achieving Levels 10 at KS1 for reading	Mean	0.23	0.23	0.23

Variable	Level	Intervention group	Comparison group (unweighted)	Comparison group (weighted)
School Proportion of pupils achieving Levels 0-4 at KS1 for maths	Mean	0.04	0.04	0.04
School Proportion of pupils achieving Level 6 at KS1 for maths	Mean	0.19	0.19	0.19
School Proportion of pupils achieving Levels 8 at KS1 for maths	Mean	0.56	0.56	0.56
School Proportion of pupils achieving Levels 10 at KS1 for maths	Mean	0.2	0.2	0.2
School type	Academies	44% (14938)	39% (4407)	44% (5015)
School type	Free Schools	1% (420)	2% (211)	1% (141)
School type	Local authority maintained schools	54% (18404)	59% (6713)	54% (6179)
School type	Special schools	0% (17)	0% (10)	X
School Ofsted rating	Good	66% (22459)	70% (7981)	66% (7540)
School Ofsted rating	Missing	14% (4779)	13% (1445)	14% (1604)
School Ofsted rating	Outstanding	12% (4010)	9% (1007)	12% (1346)
School Ofsted rating	Requires improvement	7% (2434)	7% (812)	7% (817)
School Ofsted rating	Serious Weaknesses	0% (43)	1% (72)	0% (14)

Variable	Level	Intervention group	Comparison group (unweighted)	Comparison group (weighted)
School Ofsted rating	Special Measures	0% (54)	0% (24)	0% (19)
School region	East Midlands	9% (2916)	8% (910)	9% (979)
School region	East of England	9% (3090)	9% (972)	9% (1038)
School region	London	18% (6180)	14% (1603)	18% (2075)
School region	North East	6% (1954)	8% (880)	6% (656)
School region	North West	16% (5493)	17% (1918)	16% (1844)
School region	South East	10% (3534)	14% (1627)	10% (1187)
School region	South West	8% (2566)	8% (883)	8% (861)
School region	West Midlands	12% (3983)	13% (1474)	12% (1337)
School region	Yorkshire and the Humber	12% (4063)	9% (1074)	12% (1364)
School Urban or rural	Rural	10% (3528)	14% (1577)	10% (1184)
School Urban or rural	Urban	90% (30251)	86% (9764)	90% (10157)
Pupil Gender	F	52% (17531)	52% (5890)	52% (5885)
Pupil Gender	M	48% (16248)	48% (5451)	48% (5456)
Pupil speaks EAL	N	80% (27139)	82% (9333)	80% (9112)
Pupil speaks EAL	Y	20% (6640)	18% (2008)	20% (2229)
Pupil is white British	N	36% (12136)	33% (3743)	36% (4074)
Pupil is white British	Y	64% (21643)	67% (7598)	64% (7267)
Pupil has SEN	N	72% (24191)	73% (8232)	72% (8122)
Pupil has SEN	Y	28% (9588)	27% (3109)	28% (3219)
Pupil eligible for PP	N	X	X	X
Pupil eligible for PP	Y	100% (33779)	100% (11341)	100% (11341)

Variable	Level	Intervention group	Comparison group (unweighted)	Comparison group (weighted)
Pupil IDACI quintile	Least deprived 20%	6% (2100)	8% (927)	6% (705)
Pupil IDACI quintile	2nd least deprived 20%	12% (3889)	13% (1496)	12% (1306)
Pupil IDACI quintile	Middle 20%	18% (5934)	20% (2240)	18% (1992)
Pupil IDACI quintile	2nd most deprived 20%	26% (8783)	26% (2916)	26% (2949)
Pupil IDACI quintile	Most deprived 20%	39% (13073)	33% (3762)	39% (4389)
Pupil KS1 maths score	0-4	6% (2148)	6% (703)	6% (722)
Pupil KS1 maths score	6	31% (10395)	32% (3574)	31% (3490)
Pupil KS1 maths score	8	56% (18808)	56% (6301)	56% (6314)
Pupil KS1 maths score	10	7% (2428)	7% (763)	7% (815)
Pupil KS1 reading score	0-4	9% (2903)	8% (936)	9% (974)
Pupil KS1 reading score	6	29% (9915)	30% (3355)	29% (3329)
Pupil KS1 reading score	8	53% (17939)	53% (6042)	53% (6023)
Pupil KS1 reading score	10	9% (3022)	9% (1008)	9% (1015)
Total N schools		6462	2376	2376
Total N pupils		33779	11341	11341

Table 10: Balance of characteristics before and after matching for all NTP routes in the KS2 pupil-level analysis (PLA pupils)

Variable	Level	Intervention group	Comparison group (unweighted)	Comparison group (weighted)
School % PP pupils	Mean	0.34	0.3	0.34
School % SEN pupils	Mean	0.19	0.18	0.19
School % EAL pupils	Mean	0.24	0.22	0.24
School Number of pupils in Year 6	Mean	50.17	47.34	50.17
Pupil Number of absences	Mean	17.23	17.31	17.24
School Proportion of pupils achieving Levels 0-4 at KS1 for reading	Mean	0.06	0.06	0.06
School Proportion of pupils achieving Level 6 at KS1 for reading	Mean	0.19	0.2	0.19
School Proportion of pupils achieving Levels 8 at KS1 for reading	Mean	0.51	0.52	0.51
School Proportion of pupils achieving Levels 10 at KS1 for reading	Mean	0.23	0.23	0.23

Variable	Level	Intervention group	Comparison group (unweighted)	Comparison group (weighted)
School Proportion of pupils achieving Levels 0-4 at KS1 for maths	Mean	0.05	0.05	0.05
School Proportion of pupils achieving Level 6 at KS1 for maths	Mean	0.2	0.21	0.2
School Proportion of pupils achieving Levels 8 at KS1 for maths	Mean	0.55	0.55	0.55
School Proportion of pupils achieving Levels 10 at KS1 for maths	Mean	0.2	0.2	0.2
School type	Academies	43% (8158)	38% (2833)	43% (3138)
School type	Free Schools	1% (214)	2% (134)	1% (82)
School type	Local authority maintained schools	56% (10780)	60% (4399)	56% (4146)
School type	Special schools	0% (19)	X	X
School Ofsted rating	Good	66% (12733)	70% (5131)	66% (4897)
School Ofsted rating	Missing	15% (2859)	14% (1002)	15% (1100)
School Ofsted rating	Outstanding	11% (2148)	8% (592)	11% (826)
School Ofsted rating	Requires improvement	7% (1372)	8% (570)	7% (528)
School Ofsted rating	Serious Weaknesses	0% (24)	1% (41)	0% (10)

Variable	Level	Intervention group	Comparison group (unweighted)	Comparison group (weighted)
School Ofsted rating	Special Measures	0% (35)	1% (37)	0% (13)
School region	East Midlands	9% (1722)	9% (628)	9% (662)
School region	East of England	10% (1978)	10% (729)	10% (761)
School region	London	16% (2980)	11% (812)	16% (1146)
School region	North East	5% (920)	6% (457)	5% (354)
School region	North West	17% (3183)	17% (1283)	17% (1224)
School region	South East	11% (2051)	16% (1201)	11% (789)
School region	South West	9% (1769)	9% (628)	9% (680)
School region	West Midlands	11% (2109)	11% (842)	11% (811)
School region	Yorkshire and the Humber	13% (2459)	11% (793)	13% (946)
School Urban or rural	Rural	14% (2731)	17% (1284)	14% (1050)
School Urban or rural	Urban	86% (16440)	83% (6089)	86% (6323)
Pupil Gender	F	48% (9242)	49% (3585)	48% (3555)
Pupil Gender	M	52% (9929)	51% (3788)	52% (3818)
Pupil speaks EAL	N	78% (14921)	80% (5877)	78% (5739)
Pupil speaks EAL	Y	22% (4250)	20% (1496)	22% (1634)
Pupil is white British	N	35% (6720)	32% (2357)	35% (2584)
Pupil is white British	Y	65% (12451)	68% (5016)	65% (4789)
Pupil has SEN	N	49% (9446)	52% (3830)	49% (3632)
Pupil has SEN	Y	51% (9725)	48% (3543)	51% (3741)
Pupil eligible for PP	N	40% (7682)	47% (3489)	40% (2955)
Pupil eligible for PP	Y	60% (11489)	53% (3884)	60% (4418)

Variable	Level	Intervention group	Comparison group (unweighted)	Comparison group (weighted)
Pupil IDACI quintile	Least deprived 20%	10% (1942)	14% (1019)	10% (747)
Pupil IDACI quintile	2nd least deprived 20%	15% (2912)	17% (1279)	15% (1120)
Pupil IDACI quintile	Middle 20%	19% (3590)	20% (1505)	19% (1380)
Pupil IDACI quintile	2nd most deprived 20%	25% (4726)	23% (1664)	25% (1818)
Pupil IDACI quintile	Most deprived 20%	31% (6001)	26% (1906)	31% (2308)
Pupil KS1 maths score	0-4	17% (3172)	16% (1145)	17% (1220)
Pupil KS1 maths score	6	81% (15461)	82% (6024)	81% (5946)
Pupil KS1 maths score	8	3% (538)	3% (204)	3% (207)
Pupil KS1 maths score	10	X	X	X
Pupil KS1 reading score	0-4	23% (4360)	21% (1565)	23% (1677)
Pupil KS1 reading score	6	64% (12213)	65% (4793)	64% (4697)
Pupil KS1 reading score	8	14% (2598)	14% (1015)	14% (999)
Pupil KS1 reading score	10	X	X	X
Total N schools		5760	2135	2135
Total N pupils		19171	7373	7373

Table 11: Balance of characteristics before and after matching for all NTP routes in the KS2 pupil-level analysis (PLA pupils)

Variable	Level	Intervention group	Comparison group (unweighted)	Comparison group (weighted)
School % PP pupils	Mean	0.34	0.32	0.34
School % SEN pupils	Mean	0.19	0.18	0.19
School % EAL pupils	Mean	0.24	0.24	0.24
School Number of pupils in Year 6	Mean	51.37	56.72	51.37
Pupil Number of absences	Mean	15.71	15.45	15.71
School Proportion of pupils achieving Levels 0-4 at KS1 for reading	Mean	0.06	0.05	0.06
School Proportion of pupils achieving Level 6 at KS1 for reading	Mean	0.18	0.18	0.18
School Proportion of pupils achieving Levels 8 at KS1 for reading	Mean	0.52	0.52	0.52
School Proportion of pupils achieving Levels 10 at KS1 for reading	Mean	0.24	0.24	0.24

Variable	Level	Intervention group	Comparison group (unweighted)	Comparison group (weighted)
School Proportion of pupils achieving Levels 0-4 at KS1 for maths	Mean	0.04	0.04	0.04
School Proportion of pupils achieving Level 6 at KS1 for maths	Mean	0.18	0.19	0.18
School Proportion of pupils achieving Levels 8 at KS1 for maths	Mean	0.56	0.56	0.56
School Proportion of pupils achieving Levels 10 at KS1 for maths	Mean	0.21	0.21	0.21
School type	Academies	43% (25790)	42% (13032)	43% (13151)
School type	Free Schools	1% (715)	1% (290)	1% (366)
School type	Local authority maintained schools	56% (34132)	57% (17606)	56% (17406)
School type	Special schools	0% (23)	X	0% (10)
School Ofsted rating	Good	67% (40503)	68% (21181)	67% (20654)
School Ofsted rating	Missing	14% (8491)	13% (4096)	14% (4328)
School Ofsted rating	Outstanding	12% (7339)	11% (3456)	12% (3741)
School Ofsted rating	Requires improvement	7% (4180)	7% (2123)	7% (2132)
School Ofsted rating	Serious Weaknesses	0% (56)	0% (20)	0% (31)

Variable	Level	Intervention group	Comparison group (unweighted)	Comparison group (weighted)
School Ofsted rating	Special Measures	0% (91)	0% (57)	0% (46)
School region	East Midlands	9% (5268)	9% (2805)	9% (2686)
School region	East of England	10% (6322)	11% (3261)	10% (3225)
School region	London	16% (9820)	15% (4509)	16% (5008)
School region	North East	5% (3266)	5% (1588)	5% (1665)
School region	North West	16% (9673)	15% (4592)	16% (4932)
School region	South East	11% (6919)	13% (4120)	11% (3528)
School region	South West	9% (5169)	10% (2986)	9% (2635)
School region	West Midlands	12% (7023)	13% (3925)	12% (3582)
School region	Yorkshire and the Humber	12% (7200)	10% (3147)	12% (3671)
School Urban or rural	Rural	13% (8010)	12% (3704)	13% (4084)
School Urban or rural	Urban	87% (52650)	88% (27229)	87% (26849)
Pupil Gender	F	51% (31163)	49% (15050)	51% (15891)
Pupil Gender	M	49% (29497)	51% (15883)	49% (15042)
Pupil speaks EAL	N	80% (48394)	79% (24394)	80% (24678)
Pupil speaks EAL	Y	20% (12266)	21% (6539)	20% (6255)
Pupil is white British	N	34% (20797)	35% (10806)	34% (10606)
Pupil is white British	Y	66% (39863)	65% (20127)	66% (20327)
Pupil has SEN	N	74% (44725)	76% (23500)	74% (22807)
Pupil has SEN	Y	26% (15935)	24% (7433)	26% (8126)
Pupil eligible for PP	N	44% (26881)	56% (17466)	44% (13708)
Pupil eligible for PP	Y	56% (33779)	44% (13467)	56% (17225)

Variable	Level	Intervention group	Comparison group (unweighted)	Comparison group (weighted)
Pupil IDACI quintile	Least deprived 20%	11% (6626)	14% (4363)	11% (3378)
Pupil IDACI quintile	2nd least deprived 20%	15% (9334)	17% (5161)	15% (4760)
Pupil IDACI quintile	Middle 20%	19% (11386)	20% (6076)	19% (5807)
Pupil IDACI quintile	2nd most deprived 20%	24% (14660)	23% (7027)	24% (7478)
Pupil IDACI quintile	Most deprived 20%	31% (18654)	27% (8306)	31% (9510)
Pupil KS1 maths score	0-4	5% (3177)	5% (1625)	5% (1619)
Pupil KS1 maths score	6	30% (18143)	26% (7960)	30% (9252)
Pupil KS1 maths score	8	58% (34889)	57% (17549)	58% (17791)
Pupil KS1 maths score	10	7% (4451)	12% (3799)	7% (2271)
Pupil KS1 reading score	0-4	7% (4372)	7% (2166)	7% (2229)
Pupil KS1 reading score	6	29% (17311)	25% (7686)	29% (8827)
Pupil KS1 reading score	8	55% (33203)	54% (16565)	55% (16933)
Pupil KS1 reading score	10	10% (5774)	15% (4516)	10% (2944)
Total N schools		7253	5441	5441
Total N pupils		60660	30933	30933

Table 12: Balance of characteristics before and after matching for all NTP routes in the KS4 pupil-level analysis (all pupils)

Variable	Level	Intervention group	Comparison group (unweighted)	Comparison group (weighted)
School % PP pupils	Mean	0.33	0.29	0.33
School % SEN pupils	Mean	0.17	0.18	0.17
School % EAL pupils	Mean	0.21	0.18	0.21
School Number of pupils in Year 11	Mean	172.92	167.54	172.92
Pupil Number of absences	Mean	22.71	24.09	22.71
School average KS2 maths score	Mean	104.2	104.57	104.2
School average KS2 reading score	Mean	104.6	105.06	104.6
School type	Academies	74% (25455)	67% (4673)	74% (5145)
School type	Free Schools	7% (2329)	7% (480)	7% (471)
School type	Local authority maintained schools	19% (6665)	25% (1777)	19% (1347)
School type	Special schools	0% (38)	1% (40)	X
School Ofsted rating	Good	56% (19323)	63% (4418)	56% (3905)
School Ofsted rating	Missing	15% (5066)	12% (817)	15% (1024)
School Ofsted rating	Outstanding	16% (5547)	11% (793)	16% (1121)
School Ofsted rating	Requires improvement	12% (4279)	13% (882)	12% (865)
School Ofsted rating	Serious Weaknesses	0% (108)	1% (46)	0% (22)

Variable	Level	Intervention group	Comparison group (unweighted)	Comparison group (weighted)
School Ofsted rating	Special Measures	0% (164)	0% (14)	0% (33)
School region	East Midlands	7% (2414)	9% (620)	7% (488)
School region	East of England	10% (3421)	11% (754)	10% (691)
School region	London	18% (6107)	17% (1164)	18% (1234)
School region	North East	6% (2164)	7% (515)	6% (437)
School region	North West	17% (5881)	17% (1216)	17% (1188)
School region	South East	11% (3843)	11% (743)	11% (777)
School region	South West	6% (2140)	7% (508)	6% (433)
School region	West Midlands	13% (4597)	8% (565)	13% (929)
School region	Yorkshire and the Humber	11% (3920)	13% (885)	11% (792)
School Urban or rural	Rural	8% (2792)	10% (681)	8% (565)
School Urban or rural	Urban	92% (31695)	90% (6289)	92% (6405)
Pupil Gender	F	49% (16875)	47% (3301)	49% (3411)
Pupil Gender	M	51% (17612)	53% (3669)	51% (3559)
Pupil speaks EAL	N	81% (27955)	84% (5883)	81% (5650)
Pupil speaks EAL	Y	19% (6532)	16% (1087)	19% (1320)
Pupil is white British	N	37% (12734)	33% (2267)	37% (2574)
Pupil is white British	Y	63% (21753)	67% (4703)	63% (4396)
Pupil has SEN	N	80% (27613)	78% (5460)	80% (5581)
Pupil has SEN	Y	20% (6874)	22% (1510)	20% (1389)
Pupil eligible for PP	N	55% (18939)	60% (4160)	55% (3828)
Pupil eligible for PP	Y	45% (15548)	40% (2810)	45% (3142)

Variable	Level	Intervention group	Comparison group (unweighted)	Comparison group (weighted)
Pupil IDACI quintile	Least deprived 20%	11% (3914)	19% (1298)	11% (791)
Pupil IDACI quintile	2nd least deprived 20%	15% (5186)	19% (1337)	15% (1048)
Pupil IDACI quintile	Middle 20%	19% (6495)	20% (1394)	19% (1313)
Pupil IDACI quintile	2nd most deprived 20%	24% (8386)	21% (1434)	24% (1695)
Pupil IDACI quintile	Most deprived 20%	30% (10506)	22% (1507)	30% (2123)
Total N schools		1852	439	439
Total N pupils		34487	6970	6970

Table 13: Balance of characteristics before and after matching for all NTP routes in the KS4 pupil-level analysis (PP pupils)

Variable	Level	Intervention group	Comparison group (unweighted)	Comparison group (weighted)
School % PP pupils	Mean	0.35	0.34	0.35
School % SEN pupils	Mean	0.18	0.19	0.18
School % EAL pupils	Mean	0.23	0.21	0.23
School Number of pupils in Year 11	Mean	168.77	159.94	168.77
Pupil Number of absences	Mean	28.6	31.37	28.6
School average KS2 maths score	Mean	104.07	104.22	104.07
School average KS2 reading score	Mean	104.44	104.61	104.44

Variable	Level	Intervention group	Comparison group (unweighted)	Comparison group (weighted)
School type	Academies	74% (11501)	64% (1787)	74% (2078)
School type	Free Schools	7% (1049)	8% (221)	7% (190)
School type	Local authority maintained schools	19% (2973)	28% (779)	19% (537)
School type	Special schools	0% (25)	1% (23)	X
School Ofsted rating	Good	55% (8563)	61% (1725)	55% (1548)
School Ofsted rating	Missing	14% (2253)	12% (344)	14% (407)
School Ofsted rating	Outstanding	16% (2431)	11% (301)	16% (439)
School Ofsted rating	Requires improvement	14% (2137)	15% (414)	14% (386)
School Ofsted rating	Serious Weaknesses	0% (61)	1% (22)	0% (11)
School Ofsted rating	Special Measures	1% (103)	X	1% (19)
School region	East Midlands	7% (1071)	7% (209)	7% (194)
School region	East of England	9% (1396)	12% (341)	9% (252)
School region	London	20% (3143)	21% (588)	20% (568)
School region	North East	7% (1089)	8% (212)	7% (197)
School region	North West	17% (2706)	16% (448)	17% (489)
School region	South East	10% (1494)	8% (237)	10% (270)
School region	South West	5% (849)	6% (156)	5% (153)
School region	West Midlands	14% (2164)	9% (259)	14% (391)
School region	Yorkshire and the Humber	11% (1636)	13% (360)	11% (296)
School Urban or rural	Rural	7% (1147)	10% (275)	7% (207)
School Urban or rural	Urban	93% (14401)	90% (2535)	93% (2603)
Pupil Gender	F	50% (7716)	48% (1346)	50% (1395)

Variable	Level	Intervention group	Comparison group (unweighted)	Comparison group (weighted)
Pupil Gender	M	50% (7832)	52% (1464)	50% (1415)
Pupil speaks EAL	N	80% (12412)	82% (2305)	80% (2243)
Pupil speaks EAL	Y	20% (3136)	18% (505)	20% (567)
Pupil is white British	N	41% (6442)	39% (1105)	41% (1164)
Pupil is white British	Y	59% (9106)	61% (1705)	59% (1646)
Pupil has SEN	N	79% (12221)	76% (2143)	79% (2209)
Pupil has SEN	Y	21% (3327)	24% (667)	21% (601)
Pupil eligible for PP	N	X	X	X
Pupil eligible for PP	Y	100% (15548)	100% (2810)	100% (2810)
Pupil IDACI quintile	Least deprived 20%	6% (921)	9% (262)	6% (166)
Pupil IDACI quintile	2nd least deprived 20%	10% (1597)	14% (399)	10% (289)
Pupil IDACI quintile	Middle 20%	17% (2582)	19% (520)	17% (467)
Pupil IDACI quintile	2nd most deprived 20%	27% (4125)	25% (696)	27% (745)
Pupil IDACI quintile	Most deprived 20%	41% (6323)	33% (933)	41% (1143)
Total N schools		1631	373	373
Total N pupils		15548	2810	2810

Table 14: Balance of characteristics before and after matching for all NTP routes in the KS4 pupil-level analysis (PLA pupils)

Variable	Level	Intervention group	Comparison group (unweighted)	Comparison group (weighted)
School % PP pupils	Mean	0.33	0.31	0.33
School % SEN pupils	Mean	0.18	0.21	0.18
School % EAL pupils	Mean	0.21	0.19	0.21
School Number of pupils in Year 11	Mean	168.26	156.29	168.26
Pupil Number of absences	Mean	25.31	28.13	25.31
School average KS2 maths score	Mean	103.66	103.44	103.66
School average KS2 reading score	Mean	104.09	103.9	104.09
School type	Academies	74% (6746)	67% (1180)	74% (1317)
School type	Free Schools	7% (632)	9% (158)	7% (123)
School type	Local authority maintained schools	18% (1647)	23% (401)	18% (322)
School type	Special schools	0% (33)	2% (30)	X
School Ofsted rating	Good	58% (5219)	61% (1086)	58% (1019)
School Ofsted rating	Missing	14% (1300)	12% (210)	14% (254)
School Ofsted rating	Outstanding	15% (1326)	11% (201)	15% (259)
School Ofsted rating	Requires improvement	12% (1103)	14% (244)	12% (215)
School Ofsted rating	Serious Weaknesses	1% (46)	1% (18)	X

Variable	Level	Intervention group	Comparison group (unweighted)	Comparison group (weighted)
School Ofsted rating	Special Measures	1% (64)	1% (10)	1% (13)
School region	East Midlands	8% (716)	10% (172)	8% (140)
School region	East of England	11% (1008)	13% (236)	11% (197)
School region	London	16% (1404)	15% (265)	16% (274)
School region	North East	6% (540)	5% (86)	6% (105)
School region	North West	15% (1365)	13% (236)	15% (267)
School region	South East	11% (992)	11% (203)	11% (194)
School region	South West	8% (703)	7% (129)	8% (137)
School region	West Midlands	14% (1253)	10% (174)	14% (245)
School region	Yorkshire and the Humber	12% (1077)	15% (268)	12% (210)
School Urban or rural	Rural	10% (861)	13% (229)	10% (168)
School Urban or rural	Urban	90% (8197)	87% (1540)	90% (1601)
Pupil Gender	F	47% (4272)	44% (779)	47% (834)
Pupil Gender	M	53% (4786)	56% (990)	53% (935)
Pupil speaks EAL	N	80% (7217)	82% (1447)	80% (1409)
Pupil speaks EAL	Y	20% (1841)	18% (322)	20% (360)
Pupil is white British	N	37% (3322)	35% (627)	37% (649)
Pupil is white British	Y	63% (5736)	65% (1142)	63% (1120)
Pupil has SEN	N	61% (5550)	59% (1050)	61% (1084)
Pupil has SEN	Y	39% (3508)	41% (719)	39% (685)
Pupil eligible for PP	N	49% (4455)	51% (904)	49% (870)
Pupil eligible for PP	Y	51% (4603)	49% (865)	51% (899)

Variable	Level	Intervention group	Comparison group (unweighted)	Comparison group (weighted)
Pupil IDACI quintile	Least deprived 20%	10% (899)	14% (251)	10% (176)
Pupil IDACI quintile	2nd least deprived 20%	14% (1279)	20% (346)	14% (250)
Pupil IDACI quintile	Middle 20%	19% (1743)	19% (344)	19% (340)
Pupil IDACI quintile	2nd most deprived 20%	25% (2269)	22% (394)	25% (443)
Pupil IDACI quintile	Most deprived 20%	32% (2868)	25% (434)	32% (560)
Total N schools		1477	320	320
Total N pupils		9058	1769	1769

Table 15: Balance of characteristics before and after matching for all NTP routes in the KS4 pupil-level analysis (all pupils, sensitivity analysis)

Variable	Level	Intervention group	Comparison group (unweighted)	Comparison group (weighted)
School % PP pupils	Mean	0.33	0.29	0.33
School % SEN pupils	Mean	0.17	0.16	0.17
School % EAL pupils	Mean	0.21	0.2	0.21
School Number of pupils in Year 11	Mean	172.92	182.61	172.92
Pupil Number of absences	Mean	22.71	26.65	22.71
School average KS2 maths score	Mean	104.2	104.37	104.2
School average KS2 reading score	Mean	104.6	104.88	104.6

Variable	Level	Intervention group	Comparison group (unweighted)	Comparison group (weighted)
School type	Academies	74% (25455)	74% (15281)	74% (15289)
School type	Free Schools	7% (2329)	5% (971)	7% (1397)
School type	Local authority maintained schools	19% (6665)	21% (4452)	19% (4003)
School type	Special schools	0% (38)	0% (10)	0% (24)
School Ofsted rating	Good	56% (19323)	56% (11623)	56% (11607)
School Ofsted rating	Missing	15% (5066)	13% (2708)	15% (3042)
School Ofsted rating	Outstanding	16% (5547)	16% (3312)	16% (3331)
School Ofsted rating	Requires improvement	12% (4279)	14% (2839)	12% (2570)
School Ofsted rating	Serious Weaknesses	0% (108)	1% (140)	0% (65)
School Ofsted rating	Special Measures	0% (164)	0% (92)	0% (99)
School region	East Midlands	7% (2414)	9% (1872)	7% (1449)
School region	East of England	10% (3421)	13% (2712)	10% (2055)
School region	London	18% (6107)	15% (3023)	18% (3668)
School region	North East	6% (2164)	5% (947)	6% (1300)
School region	North West	17% (5881)	16% (3242)	17% (3533)
School region	South East	11% (3843)	13% (2740)	11% (2308)
School region	South West	6% (2140)	8% (1693)	6% (1285)
School region	West Midlands	13% (4597)	12% (2587)	13% (2762)
School region	Yorkshire and the Humber	11% (3920)	9% (1898)	11% (2355)
School Urban or rural	Rural	8% (2792)	12% (2489)	8% (1677)
School Urban or rural	Urban	92% (31695)	88% (18225)	92% (19037)
Pupil Gender	F	49% (16875)	50% (10263)	49% (10136)

Variable	Level	Intervention group	Comparison group (unweighted)	Comparison group (weighted)
Pupil Gender	M	51% (17612)	50% (10451)	51% (10578)
Pupil speaks EAL	N	81% (27955)	82% (17070)	81% (16791)
Pupil speaks EAL	Y	19% (6532)	18% (3644)	19% (3923)
Pupil is white British	N	37% (12734)	34% (7068)	37% (7648)
Pupil is white British	Y	63% (21753)	66% (13646)	63% (13066)
Pupil has SEN	N	80% (27613)	81% (16774)	80% (16586)
Pupil has SEN	Y	20% (6874)	19% (3940)	20% (4128)
Pupil eligible for PP	N	55% (18939)	61% (12730)	55% (11375)
Pupil eligible for PP	Y	45% (15548)	39% (7984)	45% (9339)
Pupil IDACI quintile	Least deprived 20%	11% (3914)	15% (3008)	11% (2351)
Pupil IDACI quintile	2nd least deprived 20%	15% (5186)	18% (3647)	15% (3114)
Pupil IDACI quintile	Middle 20%	19% (6495)	20% (4206)	19% (3902)
Pupil IDACI quintile	2nd most deprived 20%	24% (8386)	23% (4786)	24% (5036)
Pupil IDACI quintile	Most deprived 20%	30% (10506)	24% (5067)	30% (6311)
Total N schools		1852	1644	1644
Total N pupils		34487	20714	20714

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