

Evaluation of The Access Project tuition on attainment at GCSE and A-Level

2017/18 cohort

Natasha Plaister
Dave Thomson

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1 Executive summary

1.1 Methodology

- This report evaluates the effect of tuition delivered as part of The Access Project (TAP) during the 2016/17 and 2017/18 academic years, as measured by attainment at GCSE and A-Level in 2017/18.
- Two cohorts of TAP pupils are included in the evaluation: those who were in Year 11 during 2017/18, and those who were in Year 13 during 2017/18.
- Our analysis used pupil-level data from the National Pupil Database (NPD) to compare the performance of pupils who took part in the project to the performance of a group of control pupils.
- Regression models were fitted to the data, with an indicator to flag whether a pupil had taken part in the project.
- We looked at the overall effect of receiving tuition, as well as the effect by: gender, time involved in the project, dosage, and by subject in which tuition was given.

1.2 Main findings

- We found positive effects on attainment for Year 11 pupils. We would estimate that a Year 11 TAP pupil would achieve more than half a GCSE grade higher in their tutored subject than a matched control pupil.
- We did not find clear evidence of an effect on attainment in their tutored subject for Year 13 pupils. Our estimates, while positive, were generally not statistically significant. However, we did find that Year 13 TAP pupils attained higher scores across their best three A-Levels than matched control pupils, of around a quarter of a grade per subject.
- Male students were more strongly affected by taking part in TAP than female students.
- Students who took part in the project across two academic years (2016/17 and 2017/18) were more strongly affected than those who took part for just one academic year (2017/18).
- There was a stronger effect on grade in the tutored subject for students with higher dosage (those who took part in more tutoring sessions) than those with lower dosage.
- When broken down by tuition subject, we found positive effects on attainment for those students tutored in English and maths GCSE, and in maths A-Level.

1.3 Limitations

- The approach used for the impact evaluation relies on constructing a control group of pupils that are statistically similar to the pupils who received TAP tuition, using data from the NPD. Creating a control group in this way means that we were unable to control for factors not observed or recorded in the NPD, such as pupils' motivation, social class or parental occupation.
- Some control pupils may have taken part in similar projects or received similar support from elsewhere. If this improved outcomes in control pupils, it may have led to underestimation of effects.
- Due to low sample sizes, we were unable to provide estimates of effect by subject for a number of subjects at both GCSE and A-Level.

2 Introduction

The Access Project (TAP) works with students from disadvantaged backgrounds, providing them with one-to-one tutoring from a trained volunteer to help them reach their potential at GCSE or A-Level, as well as other in-school support. The ultimate aim of the project is to support students in gaining access to top universities. However, in this evaluation, we focused on the impact of TAP tuition on attainment at GCSE and A-Level. Using data from the National Pupil Databased (NPD), the evaluation compared the grades of TAP students in their tutored subject, and their overall Attainment 8 and best three A-Level grades, to those of a matched control group.

Two cohorts of TAP students were used in the analysis: those who were in Year 11, and those who were in Year 13 during the 2017/18 academic year. As well as evaluating the overall impact of TAP tuition on their GCSE and A-Level grades, we also looked at how the impact varied by:

- Gender (male / female) ¹
- Time involved in the project (one year / two years)
- Dosage (number of sessions attended)
- Subject in which tuition was received

2.1 Methodology

This evaluation used what is known as a *quasi-experimental design*. This involves comparing the outcomes of pupils that received TAP tutoring to matched control group of statistically similar pupils. This approach mimics what would be done in a formal experiment such as a randomised control trial.

We selected pupils who were similar with respect to:

Pupil characteristics, all related to the outcome year:

- prior attainment at Key Stage 2 (for KS4 outcomes), or Key Stage 4 (for KS5 outcomes)
- gender (male / female)
- whether they had English as an additional language (EAL)
- ethnic group
- whether they were eligible for the Pupil Premium
- their IDACI score ²

¹ Male and female are the only gender identities recorded in the NPD for the 2017/18 academic year, and so it is not possible for us to include other categories in our analysis.

² This is a measure of the deprivation of the area in which a pupil lives. It measures the proportion of children aged 0-15 who live in income deprived households in the relevant area.

School characteristics:

- average IDACI score
- average proportion of students who had ever been eligible for free school meals
- proportion of pupils with English as an additional language
- average prior attainment at Key Stage 2 / 4
- Ofsted rating
- average proportion of students achieving a standard pass in GCSE maths and English, in the three years prior to pupil participation (KS4 outcomes)
- average A-Level points score in the three years prior to pupil participation (KS5 outcomes)
- whether or not they had a sixth form (for KS4 outcomes only)
- region

As well as matching on the characteristics above, we exactly matched students on the subject studied; that is, a TAP student who studied A-level maths, for example, would be matched to a control student who also studied A-level maths.

We used regression models to compare outcomes for the pupils who received tutoring to pupils in the matched control group. In each case, we used a dummy variable to indicate whether a pupil had taken part in TAP, and we used the characteristics listed above as control variables. This *doubly robust* approach means that our results will remain unbiased if either the model used for matching or the regression model is misspecified. Confidence intervals were obtained for our estimates by using bootstrapping.

2.2 Data

The Access Project provided a dataset consisting of all Year 11 and Year 13 students who received tutoring during the 2017/18 academic year. This included student identifiers (name and date of birth, where available), the school they attended, information on the subject in which they were tutored, and the number of sessions of tuition that they attended during 2016/17 and 2017/18. This data was linked to corresponding records in the National Pupil Database (NPD), and to publicly available school-level data.

The NPD is an administrative data resource maintained by the Department for Education and provides a history of enrolments, attendance, exclusions and attainment in national tests and public examinations (e.g. GCSE and A-level) for all pupils who have been in state-funded education since 2002. For this project, we used data on attainment at GCSE and A-Level, as well as prior attainment during Key Stage 2 for Year 11 pupils. We also used some additional demographic variables.

The original dataset of TAP pupils consisted of 288 Year 11 pupils from 27 schools and 241 Year 13 pupils from 26 institutions. Of these pupils, a small number received tutoring in two subjects; the rest received tuition in just one subject. On linking the data to the NPD, we found that a

small number of pupils from the original dataset could not be matched to pupils in the NPD who were in the relevant year group during 2017/18. There were also some Year 13 pupils for whom data on A-Level results was unavailable; this may indicate either dropout or intention to continue study into 2018/19. We excluded these pupils, as well as any pupils for whom data on demographic characteristics or prior attainment was not recorded in the National Pupil Database.

The final dataset used for analysis consisted of 286 Year 11 pupils from 27 schools and 213 Year 13 pupils from 26 institutions.

3 Mitigation of confounding effects

This section begins with an overview of how the pupils who took part in TAP compared to other pupils. We then go on to discuss the matching technique used and how successful it was in creating a matched control group.

From this point onwards, we will refer to pupils who took part in TAP as *treated pupils* and all other pupils as *potential control pupils*.

3.1 Differences between treated and potential control pupils

In this section, we review how the treated pupils compared to the potential control pupils before any matching was carried out.

Treated pupils tended to achieve higher grades than potential control students. The average Attainment 8 score for Year 11 treated pupils was 64.6, compared to 47.3 for potential control students. They also achieved higher grades at English GCSE (6.1 vs 4.6) and maths GCSE (6.3 vs 4.6) on average, compared to potential controls. Similarly for Year 13 pupils, the average A-Level points score achieved across their best three A-Levels was 10.7 for treated students and 9.1 for potential controls.³

Unsurprisingly, given the nature of the project, treated pupils were far more likely to be disadvantaged than potential control pupils. Taking the example of Year 11 pupils, 60% of treated pupils were eligible for Pupil Premium compared to 25% of potential control pupils, and the mean IDACI score for treated pupils was 0.36 compared to 0.20 for potential controls. Differences were similar for Year 13 pupils. TAP pupils were also more likely to go to a school with a high proportion of disadvantaged pupils; the average proportion of students ever eligible for FSM in a school that took part in The Access Project was 55%, compared to 26% for all other mainstream secondary schools.

Treated pupils were more likely to have English as an additional language than potential control pupils (64% vs 17% for Year 11 pupils; 58% vs 16% for Year 13), and more likely to go to a school with a high proportion of EAL students (mean proportion 53% for TAP schools vs 15% for potential controls). There were also some differences in ethnicity; most strikingly, just 10% of Year 11 treated pupils were white British compared to 70% of Year 11 potential controls. For Year 13 pupils, these figures were 9% and 68%.

More female than male students received tutoring; 60% of Year 11 pupils were female, compared with 50% of potential controls.⁴ The difference was smaller for Year 13 pupils; 57% of treated students were female, compared to just under 57% of potential controls. The higher

³ A-Level point scores were scaled to relate to grades as follows: 6 - A*, 5 - A, 4 - B, 3 - C, 2 - D, 1 - E

⁴ The National Pupil Database currently records gender using two categories: male and female. Our analysis is therefore limited to these categories and we are unable to account for other gender identities.

proportion of females in the potential controls for this age group reflects gender differences in progression to A-Level.

Turning to a comparison of TAP schools and the schools attended by potential control pupils, there were some differences in addition to those already discussed above. TAP schools were overwhelmingly located in London, although there were also three in the East Midlands and five in the West Midlands. Again, this is to be expected given the nature of the project, which works in a limited number of geographical locations.⁵

TAP schools were more likely to have an outstanding Ofsted rating than other schools; 50% of TAP schools had this rating compared to 22% of other schools. Just one TAP school (4%) had a rating other than good or outstanding; this compares to 16% of other schools.

These differences between the treated and potential control pupils, and the institutions that they attended, mean that we can't assume that the higher attainment achieved by treated pupils is caused by the tutoring they received through TAP; it may be caused by the other differences between the two groups. This is why it is useful to create a matched control group. By doing so, we can control for these differences and produce a more robust evaluation of the impact that TAP tutoring has on attainment.

3.2 Extent of success in creating matched controls

The matching process was carried out using the nearest neighbour method, pairing treated and control students based on propensity scores. A propensity score can be thought of as a measure of how typical each pupil is of pupils in the treated group. As shown in section 3.1, treated pupils are more likely to be eligible for Pupil Premium than others, less likely to be white British, and much more likely to come from London. So a white British pupil who is not eligible for Pupil Premium and is from outside London would probably have a low propensity score, and vice versa. The nearest neighbour method begins by calculating propensity scores for all students, both treated and potential control. Then it simply pairs each treated student with the potential control student with the nearest propensity score.

Before fitting the propensity score models, we removed potential control pupils from schools that were ineligible for TAP support, including those located outside the geographical area covered by TAP, and selective schools. We also separately matched two subsets of treated pupils for each year group: male and female. These subsets of matched data were used to evaluate the impact of the programme on male and female students.

Pupils were matched on the variables described in section 2.1. For Year 13 students, this includes matching on their schools' A-Level results for the three years before pupils began receiving TAP support; that is, 2013/14, 2014/15 and 2015/16. However, six of the 26 schools in

⁵ At the time of writing, these locations were London, Birmingham and the Black Country, and the East Midlands towns of Shirebrook, Mansfield and Ashfield.

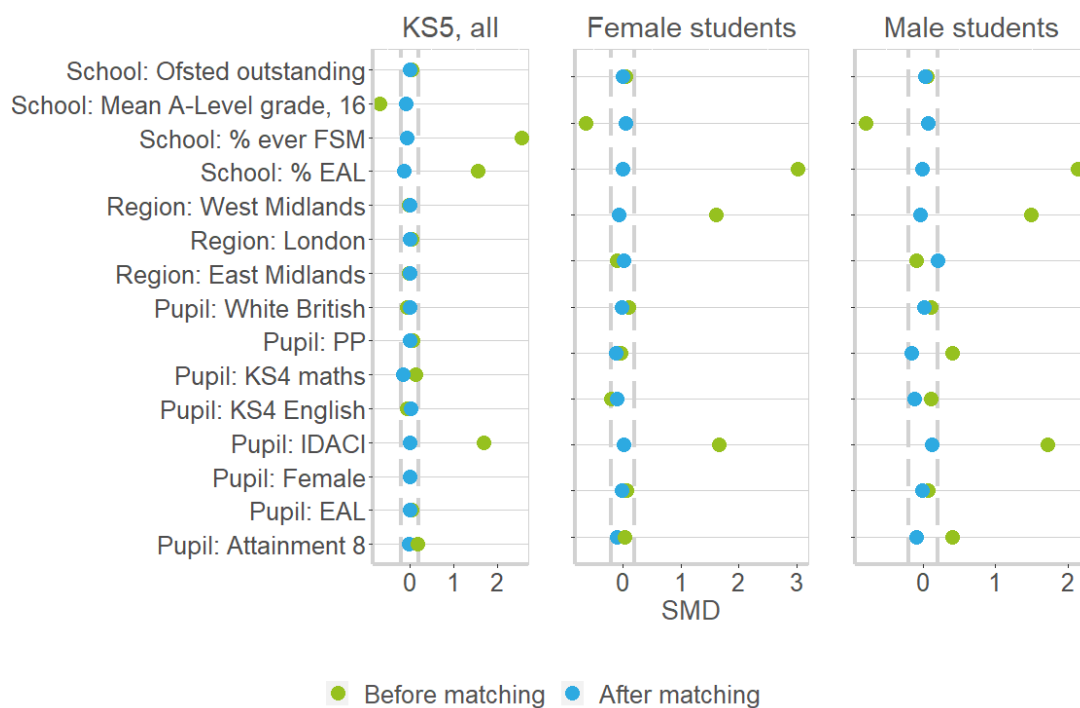
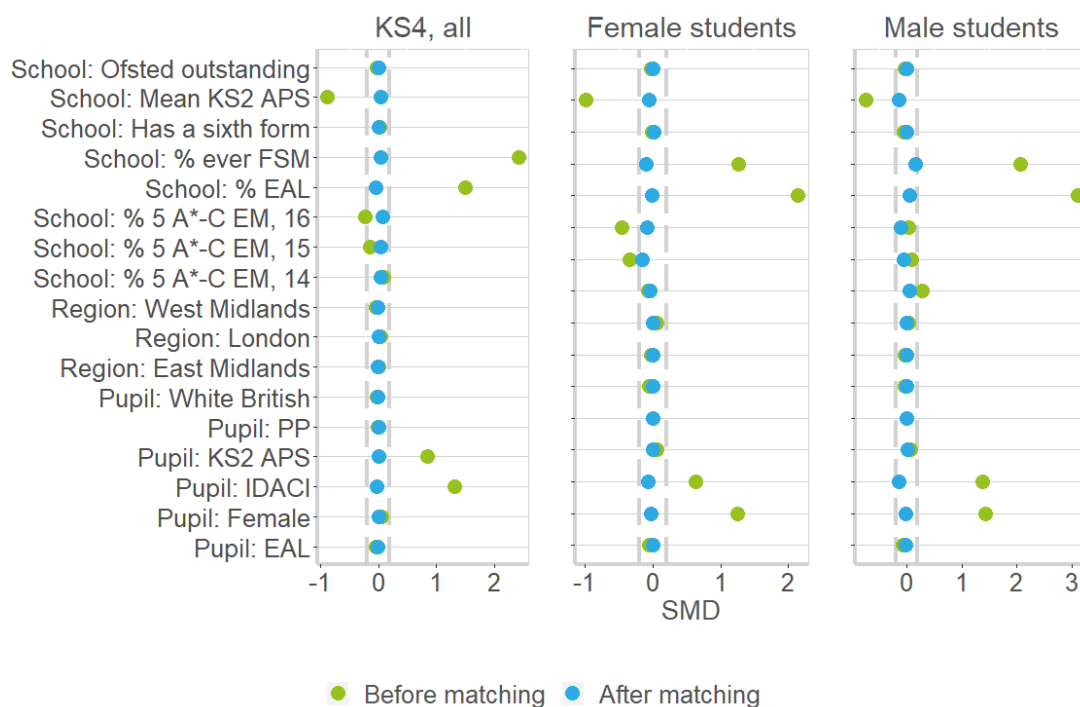
which Year 13 students participated in TAP had opened relatively recently and did not have any students taking A-Levels for some of the relevant years. The majority of these schools did have data available for 2015/16, so where data on earlier years was unavailable, we matched pupils solely on 2015/16 school A-Level results. The remaining schools, along with one further education college, were matched using an alternative method. Pupils at these institutions were exact matched on region, Ofsted rating and pupil characteristics, before being paired to a control using nearest neighbour matching based on Mahalanobis distance.

The graphs in figure 1, known as *love plots*,⁶ show how similar the treated and control pupils were to one another, before and after matching, using a measure called the standardised mean difference. The mean difference is simply the difference between the average value of the variable for the treated students, and the average value for the control students. Standardising this measure means that we can compare balance across different variables. Generally, a standardised mean difference of 0.2 or below is considered to indicate good balance. This threshold is shown on the graphs as a dotted line.

As shown in figure 1, the matching process successfully created well-matched control groups for both Year 11 and Year 13 pupils, and for male and female students from each year group.

⁶ Loveplots are named for Professor Thomas E. Love, who first developed them along with colleagues (<https://academic.oup.com/eurheartj/article/27/12/1431/647407>)

Figure 1: Standardised mean differences between treated and control groups, before and after matching



4 Results

Results are given in three different forms: estimated impact, effect size, and months of progress.

Estimated impact is given in the same units as the outcome measure. In this report, there are two outcome measures: GCSE grade and A-level grade. In both cases, an estimated impact of one would mean that we'd expect a TAP student to achieve one grade higher than a non-TAP student.

However, when using estimated impact it is difficult to compare across different outcome measures. It's not necessarily the case that an estimated impact of 0.75, for example, on GCSE grade is the equivalent of an estimated impact of 0.75 on A-level grade; having an impact on A-level grade may be more challenging than having an impact on GCSE grade, for example. It is also difficult to compare the effect of TAP to the effect of another project that focuses on a different outcome measure using estimated impact.

The effect size is used to get around this problem. It is a standardised version of the estimated impact. That is, it is the estimated impact divided by the standard deviation in the outcome measure among all pupils entered for a particular subject. Because it is a standardised measure, it can be compared across different outcomes.

However, effect sizes can be difficult to interpret; it is not immediately obvious whether an effect size of, for example, 0.5 is large or small. Months of progress are a measure used in education research to try and help with this. In this report, effect sizes were translated into equivalent months of progress using guidance developed by the Education Endowment Foundation⁷, as shown in table 1. In our example, an effect size of 0.5 would be the equivalent of six months of additional progress; expressed using the months of progress measure, it is clear that this is a large effect.

Table 1: Effect sizes and equivalent months of progress

Effect size from	To	Months of progress
-0.04	0.04	0
0.05	0.09	1
0.10	0.18	2
0.19	0.26	3
0.27	0.35	4
0.36	0.44	5
0.45	0.52	6

⁷ As described at <https://educationendowmentfoundation.org.uk/projects-and-evaluation/evaluating-projects/evaluator-resources/writing-a-research-report>, accessed January 2020

0.53	0.61	7
0.62	0.69	8
0.70	0.78	9
0.79	0.87	10
0.88	0.95	11

4.1 Year 11 pupils

4.1.1 Overall

Estimates of the impact of TAP tuition on attainment at GCSE in the tutored subject, and on overall Attainment 8 score, are shown in table 2, with 95% confidence intervals (all to two decimal places). Also included in the table are estimates of effect size and equivalent months of progress. Effect size and months of progress are useful for comparing the magnitude of effects across different outcomes, and will be used in section 5.1 to compare the effects of TAP tuition on outcomes in the tutored subject and on Attainment 8, as well as to compare outcomes for Year 11 and Year 13 pupils.

GCSE grades are shown here as point scores ranging from 9-1, with a difference of one point being the equivalent of one grade. An estimated effect of 0.5, for example, would be the equivalent of half a grade. Attainment 8 scores are point scores ranging from 0-90; the sum of GCSE point scores for eight qualifications, with English and maths double weighted.

Table 2: Estimated effect of TAP tuition on KS4 attainment

Outcome	Lower CI	Estimate	Upper CI	Effect size	Months of progress	Number pupils
Attainment 8	4.93	6.70	8.50	0.37	5	572
Tutored subject	0.41	0.65	0.89	0.33	4	572

These results do provide evidence that TAP tuition has a positive effect on both GCSE attainment in the tutored subject and overall Attainment 8. We would estimate that a treated pupil would achieve over half a GCSE grade more than a control pupil in their tutored subject; to be precise, 0.65 of a grade more. As the confidence interval does not include zero, this result is statistically significant at the 95% level. The estimated impact on Attainment 8 is higher, as can be seen by comparing the effect sizes and months of progress. This suggests that, as well as achieving higher grades in their tutored subject, TAP subjects achieved higher grades in other subjects than control pupils.

4.1.2 Gender

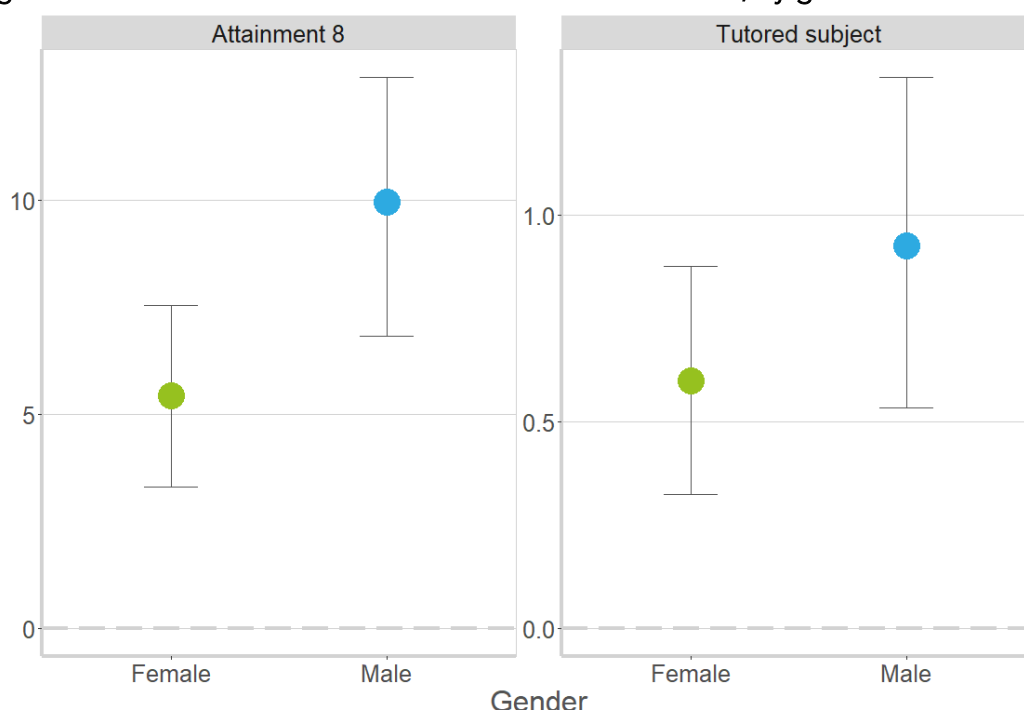
Estimates of the impact of TAP tuition on attainment at GCSE in the tutored subject, broken down into male and female students, are shown in table 3. As before, all figures are rounded to two decimal places and include 95% confidence intervals, effect sizes and equivalent months of progress. Results are also summarised in figure 2.

Table 3: Estimated effect of TAP tuition on KS4 attainment, by gender

Outcome	Gender	Lower CI	Estimate	Upper CI	Effect size	Months of progress	Number of pupils
Attainment 8	Male	6.82	9.94	12.85	0.54	7	224
Attainment 8	Female	3.30	5.43	7.55	0.30	4	348
Tutored subject	Male	0.53	0.93	1.33	0.45	6	224
Tutored subject	Female	0.33	0.60	0.88	0.30	4	348

These results provide evidence that TAP tuition has a positive effect on GCSE attainment for both male and female students. However, the effect is stronger for male students. We would estimate that a male treated pupil would achieve nearly a whole GCSE grade more than a control pupil in their tutored subject, while a female treated student would achieve just 0.60 of a grade more than a control student. As before, the impact on Attainment 8 is even higher, with a male TAP pupil estimated to make the equivalent of seven months more progress than a male control pupil. As none of the confidence intervals for any of the estimates contain zero, all are statistically significant.

Figure 2: Estimated effect of TAP tuition on KS4 attainment, by gender



4.1.3 Time involved in project

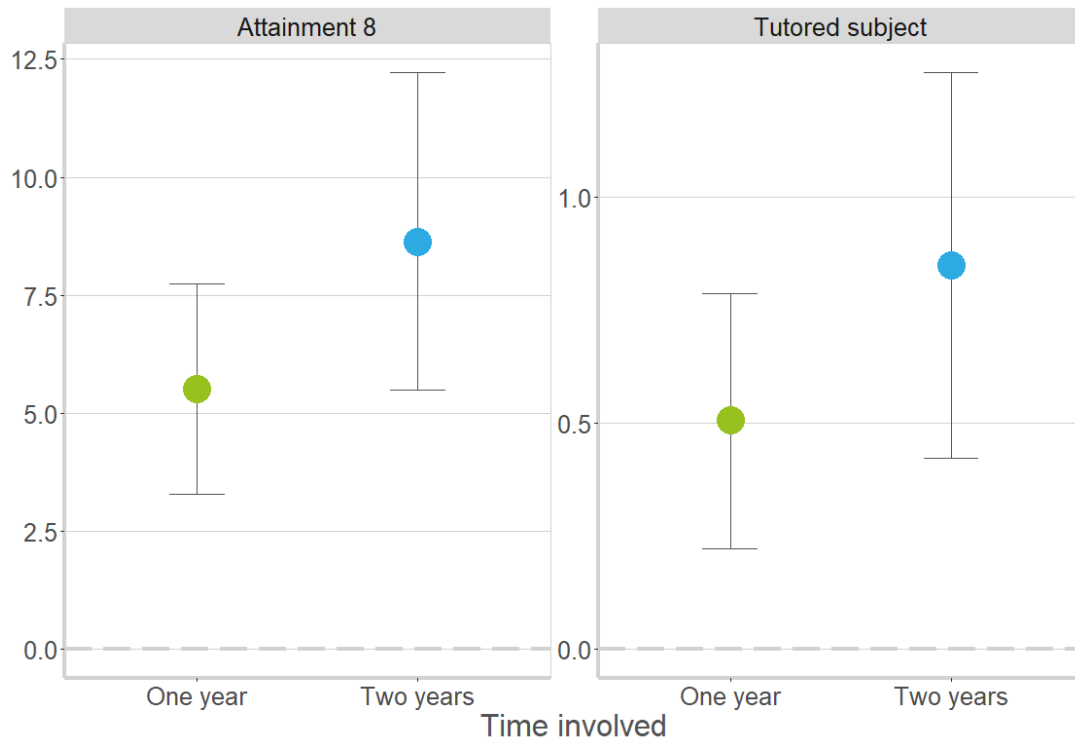
Estimates of the impact of TAP tuition on attainment at GCSE in the tutored subject, broken down into those pupils who received tuition for just one year and those who received tuition for two years, are shown in table 4. As before, all figures are rounded to two decimal places and include 95% confidence intervals, effect sizes and equivalent months of progress. Results are also summarised in figure 3.

Table 4: Estimated effect of TAP tuition on KS4 attainment, by length of time involved in project

Outcome	Time involved	Lower CI	Estimate	Upper CI	Effect size	Months of progress	Number of pupils
Attainment 8	One year	3.28	5.51	7.73	0.30	4	316
Attainment 8	Two years	5.50	8.62	12.22	0.47	6	256
Tutored subject	One year	0.22	0.51	0.79	0.26	3	316
Tutored subject	Two years	0.42	0.85	1.28	0.43	5	256

These results provide evidence that TAP tuition has a positive effect on GCSE attainment for students who received tuition solely during Year 11 and for those who received tuition during both Year 10 and Year 11. The effect is stronger for those pupils who received tutoring during both years. We would estimate that a pupil who received tuition for one year would achieve just over half a GCSE grade more than a control pupil, while a pupil who received tuition for two years would achieve 0.85 of a grade more than a control student. The estimated impact on Attainment 8 scores is even higher, with a pupil tutored for two years estimated to make the equivalent of six months more progress than a control pupil. As none of the confidence intervals for any of the estimates contain zero, all are statistically significant.

Figure 3: Estimated effect of TAP tuition on KS4 attainment, by length of time involved in project



4.1.4 Dosage

Estimates of the impact of TAP tuition on attainment at GCSE in the tutored subject, broken down into level of dosage, are shown in table 5 and figure 4. Dosage is here defined as the number of tuition sessions attended by a pupil during Year 11, categorised into *very low* (nine sessions or less) *low* (between ten and fourteen sessions), *medium* (between fifteen and twenty sessions) and *high* (twenty-one sessions or more).⁸

Table 5: Estimated effect of TAP tuition on KS4 attainment, by dosage

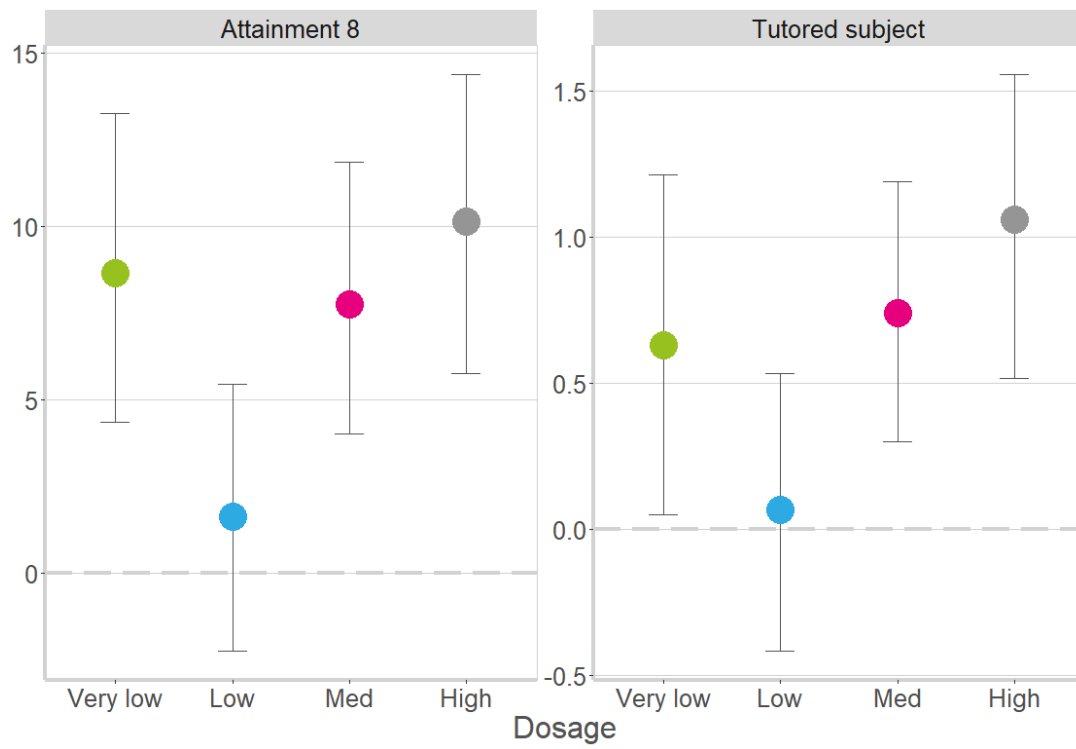
Outcome	Dosage	Lower CI	Estimate	Upper CI	Effect size	Months of progress	Number of pupils
Attainment 8	Very low	4.37	8.67	13.25	0.47	6	140
Attainment 8	Low	-2.24	1.64	5.47	0.09	1	140
Attainment 8	Med	4.04	7.77	11.84	0.42	5	158
Attainment 8	High	5.76	10.15	14.38	0.56	7	134
Tutored subject	Very low	0.05	0.63	1.21	0.32	4	140
Tutored subject	Low	-0.42	0.07	0.53	0.03	0	140
Tutored subject	Med	0.30	0.74	1.19	0.38	5	158
Tutored subject	High	0.52	1.06	1.56	0.54	7	134

These results provide evidence that TAP tuition has a positive effect on GCSE attainment in the tutored subject for students who attended either a very low, medium or high number of sessions. We would estimate that a pupil who attended a medium number of sessions would achieve 0.74 of a GCSE grade more than a control pupil, and a pupil who attended a high number would achieve over a grade (1.06) more than a control student. As neither of the confidence intervals contain zero, both are statistically significant. While there is a significant positive effect on those pupils who attended a very low number of sessions, the confidence interval for this estimate is very wide, with the lower band only just above zero. This suggests that there was a lot of variation in outcomes for this group. There was no significant effect for pupils who attended a low number of sessions.

Looking at Attainment 8, there was a significant difference in attainment for all TAP pupils except those in the low group. We would estimate that a pupil attending a high number of sessions would make seven months more progress than a matched control pupil. However, surprisingly, the effect on those students who attended a very low number of sessions is nearly as high, the equivalent of six months of additional progress.

⁸ These dosage levels are based on discussion with TAP. Results obtained using alternative dosage levels are available in the appendix.

Figure 4: Estimated effect of TAP tuition on KS4 attainment, by dosage



4.1.5 By subject

Estimates of the impact of TAP tuition on attainment at GCSE, broken down by tutored subject, are shown in table 6. We excluded any subject for which data on less than thirty treated students was available; these sample sizes are too low to carry out meaningful analysis. English and maths were the only two subjects that met this condition.

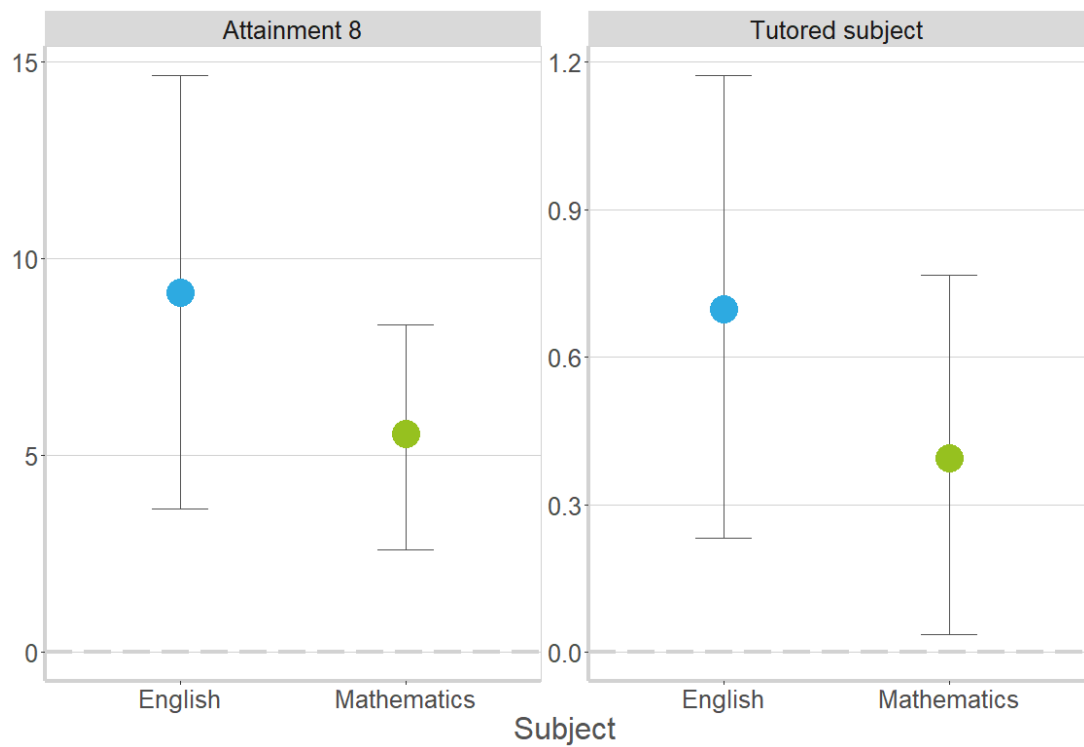
Figures in table 6 are rounded to two decimal places and include 95% confidence intervals, effect sizes and equivalent months of progress. Results are also summarised in figure 5.

Table 6: Estimated effect of TAP tuition on KS4 attainment, by subject

Outcome	Subject	Lower CI	Estimate	Upper CI	Effect size	Months of progress	Number of pupils
Attainment 8	English	3.65	9.13	14.66	0.39	5	118
Attainment 8	Mathematics	2.62	5.56	8.32	0.19	3	240
Tutored subject	English	0.23	0.70	1.17	0.50	6	118
Tutored subject	Mathematics	0.04	0.39	0.77	0.30	4	240

These results provide evidence that TAP tuition has a positive effect on GCSE attainment in both English and maths. The effect is stronger in English than in maths. We would estimate that a pupil who was tutored in English would achieve a grade 0.70 higher than a control pupil, and a pupil tutored in maths would achieve a grade 0.39 higher than a control pupil. As in previous results, the estimated effect on Attainment 8 score is higher, with pupils tutored in English estimated to make nearly six months more progress than control pupils, and those tutored in maths four months more. As none of the confidence intervals for any of the estimates contain zero, all are statistically significant at the 95% level.

Figure 5: Estimated effect of TAP tuition on KS4 attainment, by subject



4.2 Year 13 pupils

4.2.1 Overall

Estimates of the impact of TAP tuition on attainment at A-Level are shown in table 7, with 95% confidence intervals, effect size and equivalent months of progress. As well as looking at the effect on A-Level grade in the tutored subject, we also look at the effect on students' total score in their best three A-Levels.

A-Level grades are shown here as point scores ranging from 0-6. These relate to letter grades as follows: A* - 6, A - 5, B - 4, C - 3, D - 2, E - 1. Best three grades are also shown as point scores ranging from 0-18; these are simply the sum of a student's point score for their best three A-Levels.

These results do not provide conclusive evidence that TAP tuition has a positive effect on A-Level attainment in the tutored subject. Although the estimated effect is positive at 0.21 (the equivalent of around one fifth of an A-Level grade), the confidence interval contains zero; we cannot be confident that there is an effect. However, we do see a significant difference in best three scores, the equivalent of just over a quarter of a grade per subject. The effect size for best three score is slightly higher than that for grade in tutored subject.

Table 7: Estimated effect of TAP tuition on KS5 attainment

Outcome	Lower CI	Estimate	Upper CI	Effect size	Months of progress	Number of pupils
Best 3	0.13	0.83	1.53	0.19	3	426
Tutored subject	-0.03	0.21	0.44	0.15	2	426

4.2.2 Gender

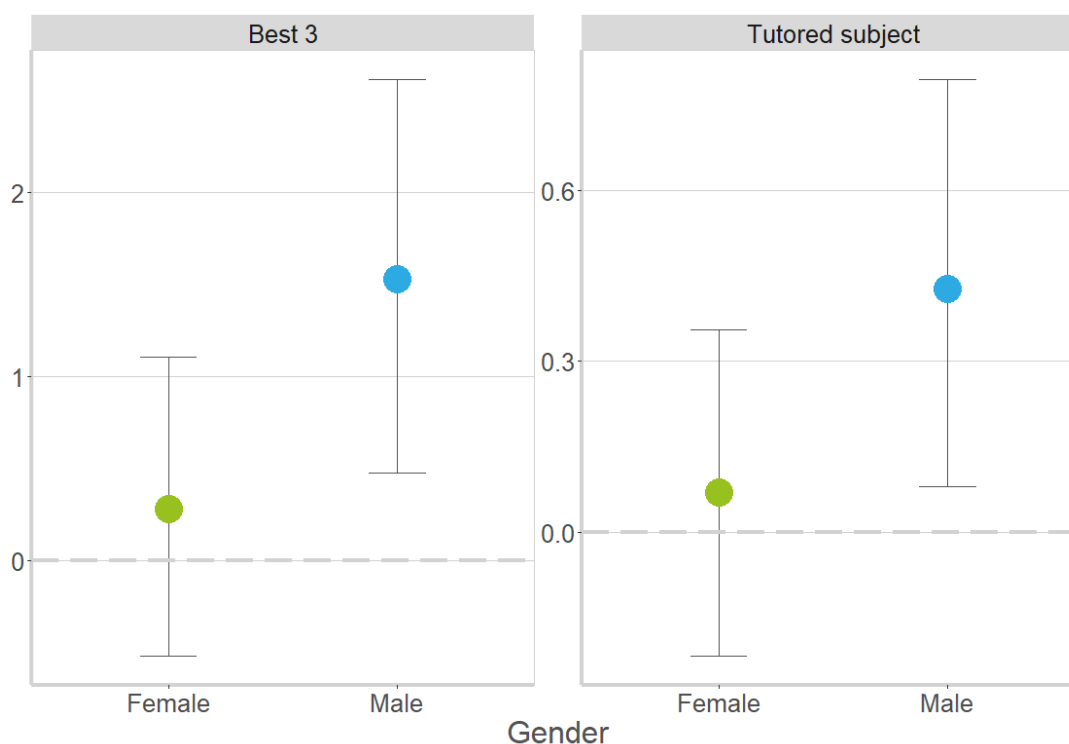
Estimates of the impact of TAP tuition on attainment at A-Level in the tutored subject, broken down into male and female students, are shown in table 8. As before, all figures are rounded to two decimal places and include 95% confidence intervals, effect sizes and equivalent months of progress. Results are also summarised in figure 6.

Table 8: Estimated effect of TAP tuition on KS5 attainment, by gender

Outcome	Gender	Lower CI	Estimate	Upper CI	Effect size	Months of progress	Number of pupils
Best 3	Male	0.48	1.53	2.62	0.34	4	180
Best 3	Female	-0.52	0.28	1.11	0.07	1	246
Tutored subject	Male	0.08	0.43	0.80	0.30	4	180
Tutored subject	Female	-0.22	0.07	0.36	0.05	1	246

These results provide evidence that TAP tuition has a positive effect on both attainment in the tutored subject and best three scores for male students, the equivalent of four months of additional progress for both outcomes. However, they do not provide evidence of a positive impact on female students. Although the estimates are positive, the confidence intervals contain zero. Hence, we cannot be confident that there is any effect.

Figure 6: Estimated effect of TAP tuition on KS5 attainment, by gender



4.2.3 Time involved in project

Estimates of the impact of TAP tuition on attainment at A-Level, broken down into those pupils who received tuition for just one year and those who received tuition for two years, are shown in table 9 and figure 7.

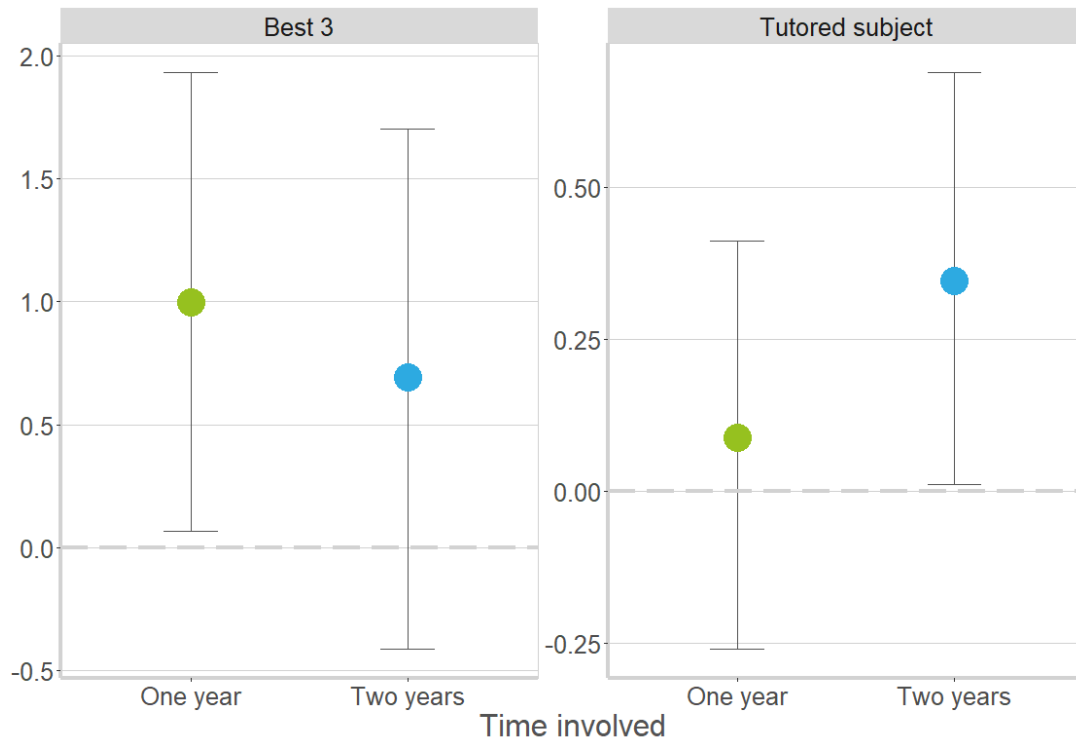
Table 9: Estimated effect of TAP tuition on KS5 attainment, by length of time involved in project

Outcome	Time involved	Lower CI	Estimate	Upper CI	Effect size	Months of progress	Number of pupils
Best 3	One year	0.07	1.00	1.93	0.23	3	244
Best 3	Two years	-0.41	0.69	1.70	0.16	2	182
Tutored subject	One year	-0.26	0.09	0.41	0.06	1	244
Tutored subject	Two years	0.01	0.35	0.69	0.25	3	182

These results do not provide conclusive evidence that TAP tuition has a positive effect on A-Level attainment in the tutored subject for students who received tuition solely during Year 13. The estimated impact on attainment in the tutored subject is positive, but not significant, although the estimated impact on best three scores is significant and positive. However, for those students who received tuition during both Year 12 and Year 13, we did find a significant positive effect on grade in the tutored subject, of around a third of a grade. We did not find any significant effect on best three scores for these students.

As was also the case for Year 11 students, the estimated effect on grade in the tutored subject is higher for students who received two years of tuition is higher than that for those who received just one year. The estimated effect on best three scores, however, is actually lower for those who received two years of tuition, although both estimates have rather wide confidence intervals.

Figure 7: Estimated effect of TAP tuition on KS5 attainment, by length of time involved in project



4.2.4 Dosage

Estimates of the impact of TAP tuition on attainment at A-Level, broken down into level of dosage, are shown in table 10 and figure 8. Dosage is here defined as the number of tuition sessions attended by a pupil during Year 13, categorised into *very low* (eight sessions or less) *low* (between nine and sixteen sessions), *medium* (between seventeen and twenty-two sessions) or *high* (twenty-three sessions or more).⁹

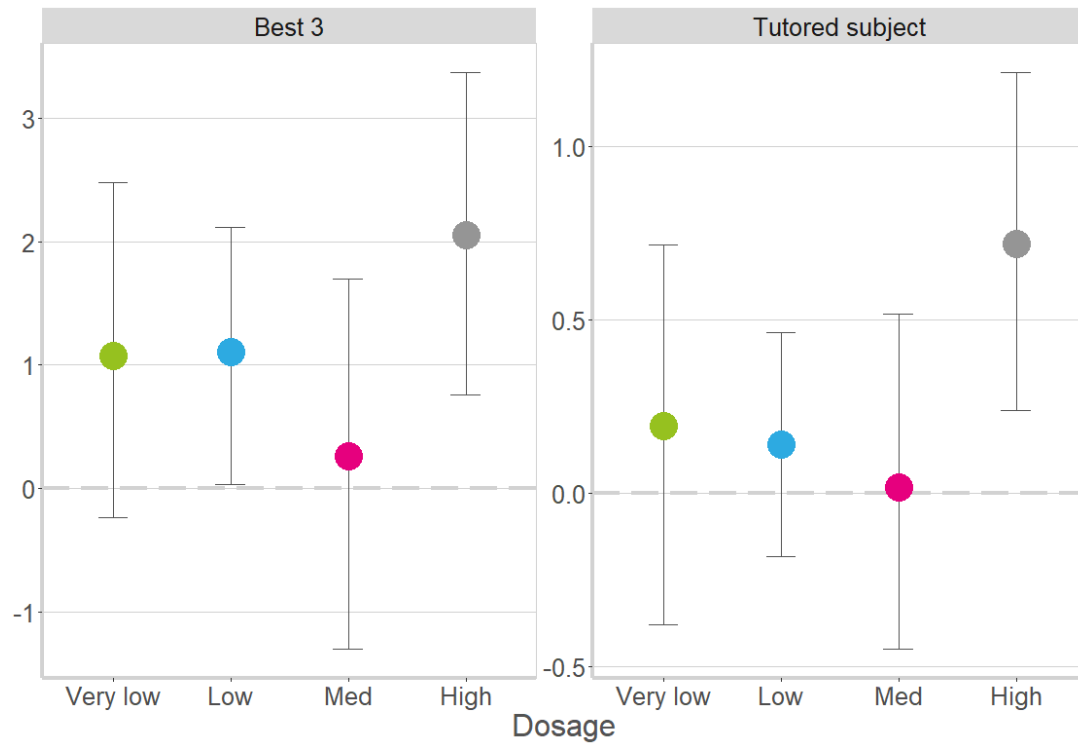
Table 10: Estimated effect of TAP tuition on KS5 attainment, by dosage

Outcome	Dosage	Lower CI	Estimate	Upper CI	Effect size	Months of progress	Number of pupils
Best 3	Very low	-0.23	1.08	2.48	0.25	3	108
Best 3	Low	0.03	1.11	2.12	0.26	3	118
Best 3	Med	-1.30	0.26	1.69	0.06	1	112
Best 3	High	0.76	2.05	3.37	0.47	6	88
Tutored subject	Very low	-0.38	0.19	0.71	0.14	2	108
Tutored subject	Low	-0.18	0.14	0.46	0.10	2	118
Tutored subject	Med	-0.45	0.02	0.52	0.01	0	112
Tutored subject	High	0.24	0.72	1.21	0.52	6	88

These results provide evidence that TAP tuition has a positive effect on A-level attainment in the tutored subject and best three scores for students who attended a high number of sessions. We would estimate that a pupil who attended a high number of sessions would achieve 0.72 of an A-level grade more than a control pupil. However, these results do not provide conclusive evidence that TAP tuition has a positive effect on A-Level attainment for students at the very low, low or medium dosage levels. None of the estimates for attainment in the tutored subject are significant, and so we cannot be confident that there is any effect. There is a positive significant estimate on best three scores for the low dosage group, but the lower confidence interval is only just above zero.

⁹ These dosage levels are based on discussion with TAP. Results obtained using alternative dosage levels are available in the appendix.

Figure 8: Estimated effect of TAP tuition on KS5 attainment, by dosage



4.2.5 By subject

Estimates of the impact of TAP tuition on attainment at A-Level, broken down by tutored subject, are shown in table 11. As for Year 11 outcomes, we excluded any subject for which data on less than thirty treated students was available; these sample sizes are too low to carry out meaningful analysis. Maths was the only subject which met this condition.

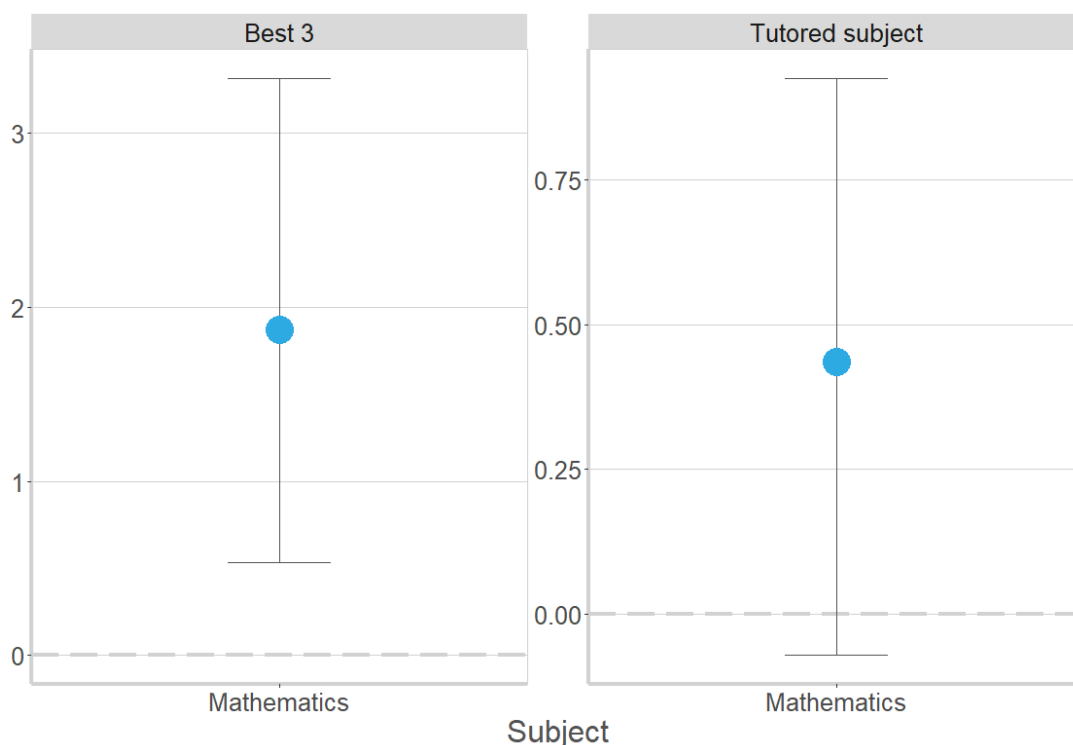
As before, figures in table 11 are rounded to two decimal places and include 95% confidence intervals, effect sizes and equivalent months of progress, and results are also summarised in figure 9.

Table 11: Estimated effect of TAP tuition on KS5 attainment, by subject

Outcome	Subject	Lower CI	Estimate	Upper CI	Effect size	Months of progress	Number of pupils
Best 3	Mathematics	0.53	1.87	3.31	0.45	6	108
Tutored subject	Mathematics	-0.07	0.44	0.93	0.28	4	108

These results provide some evidence that TAP tuition has a positive effect on A-Level attainment in mathematics. We would estimate that a pupil who was tutored in mathematics would achieve a best three score of nearly two-thirds of a grade per subject higher than a control pupil. However, the estimated impact on grade in the tutored subject, while positive at 0.44, or nearly half a grade, is not significant; the confidence interval contains zero.

Figure 9: Estimated effect of TAP tuition on KS5 attainment, by subject



5 Conclusions

5.1 Limitations

This impact evaluation was subject to a number of limitations. Many of these arise from the fact that treated and control pupils were matched using observational data from the National Pupil Database (NPD). The NPD is, of course, limited in scope. For example, it does not include information about social class, parental occupations or school funding levels. Not accounting for these unobserved variables may introduce bias into our estimates.

In this case, it is also possible that selection bias has played a part, at both the school and pupil level. For example, schools that joined TAP may be more those that are particularly focused on supporting disadvantaged students. At the pupil level, it is possible that pupils who took part in TAP were more motivated than other pupils and it is this, rather than participation in TAP, that is driving their increased attainment.

Some control pupils may have taken part in similar projects or received tutoring from another source. If this was the case, our analysis would not be an evaluation of TAP tuition against no equivalent support, but instead against no support in some cases and other, similar support in the rest. This could lead us to underestimate the effect of TAP, assuming that the equivalent support had a positive effect on some control pupils' outcomes. We would note, however, that not controlling for this effect may be the relevant analysis as it represents an evaluation of TAP against current conditions, with schools' and / or pupils' choices to engage with other projects being included in the makeup of controls.

There were fewer Year 13 pupils included in this evaluation than Year 11 pupils; 213 Year 13 TAP pupils were included in the analysis compared to 286 from Year 11. Including fewer pupils reduces the power of the evaluation; it makes it more likely that the evaluation will result in inconclusive estimates with wide confidence intervals.

5.2 Discussion

This evaluation provides evidence to show that TAP tuition of Year 11 pupils had a positive effect on GCSE attainment in the tutored subject in 2017/18. TAP pupils achieved higher grades when compared to a matched control group, of around 0.5 of a GCSE grade. The effect on male students was stronger than that on female students, with male TAP students achieving nearly a whole grade more than controls. The effect was stronger for pupils who had been receiving tuition during both Year 10 and Year 11 than for those who received support for just one year. Those who attended a high number of sessions were affected more strongly than those who attended a medium number, but the pattern was less clear for those who attended a low or very low number of sessions.

TAP students also achieved significantly higher Attainment 8 scores than matched control pupils. However, the effect for those attending a low number of sessions was almost as high as that on those who attended a high number. The fact that TAP pupils achieved higher Attainment 8 scores than control pupils may indicate that tuition has an impact on transferable

skills that are useful beyond the tutored subject. On the other hand, it may be the case that pupils who take part in TAP are more highly motivated than pupils in the control group, and this at least partly explains their higher attainment. Differences in motivation may also go some way to explaining the higher effect on the high dosage groups; those pupils who attended a higher number of sessions may be those with even higher levels of motivation.

The analysis of effects of TAP tuition on the A-Level attainment of Year 13 pupils was mainly inconclusive. While estimates were positive, they were generally not significant, and were smaller than those made for the GCSE attainment of Year 11 pupils. This is clear when we compare effect sizes and equivalent months of progress. The overall effect size for GCSE grade in the tutored subject is 0.33, the equivalent of four months of additional progress (as shown in section 4.1.1), while for A-Level attainment the effect size is just 0.15, or two months of additional progress (as shown in section 4.2.1).

However, we did find evidence of a significant positive effect on A-level grade for male students, of just under half a grade in the tutored subject. There was also a positive effect on point scores for their best three A-levels, the equivalent of just over half a grade per subject. We found a strong significant effect for students who attended a high number of sessions, but did not find any significant effect on those who attended less than twenty-three sessions. A significant positive effect on best three A-level point scores was also found for high dosage students, the equivalent of around two-thirds of a grade per subject.

There was one area in which the effect on Year 13 pupils was stronger than on Year 11 pupils; the analysis of A-Level attainment broken down by subject. We were only able to carry this out for maths A-Level due to small sample sizes in other subjects. Not only did the analysis show a significant positive effect on best three points, the equivalent of around two-thirds of a grade per subject, the effect was actually larger than that for maths tuition at GCSE. The effect on best three scores is the equivalent of six months of additional progress, compared to five for Attainment 8.

It may seem contradictory that no overall significant effects were found for A-Level attainment, but a significant effect was found for those students tutored in maths. This result implies that tuition in some subjects other than maths did not have a clear positive effect; students may have done no better, or even worse, than matched controls. When analysed as a whole, the effect (or lack of effect) of tuition in these subjects may have hidden the positive effect of maths tuition. However, as we did not have enough data on to analyse other subjects separately at A-Level, we are unable to draw any clear conclusions on this.

In conclusion, this evaluation found that TAP tuition during Years 10 and 11 had a positive effect on GCSE attainment in 2017/18, and found evidence that TAP tuition during Years 12 and 13 had a positive effect on A-Level attainment for some groups of students.

6 Appendix: Alternative dosage levels

This appendix presents the results obtained by dosage, using wider dosage bands than those used in the main analysis. The results shown below are broadly in line with those given in the body of the report, suggesting that the results are not overly sensitive to the choice of dosage bands.

6.1 Year 11 pupils

Estimates of the impact of TAP tuition on attainment at GCSE in the tutored subject, broken down into level of dosage, are shown in table 12 and figure 10. Dosage is here defined as the number of tuition sessions attended by a pupil during Year 11, categorised into *low* (ten sessions or less) *medium* (between ten and twenty sessions) or *high* (twenty sessions or more).

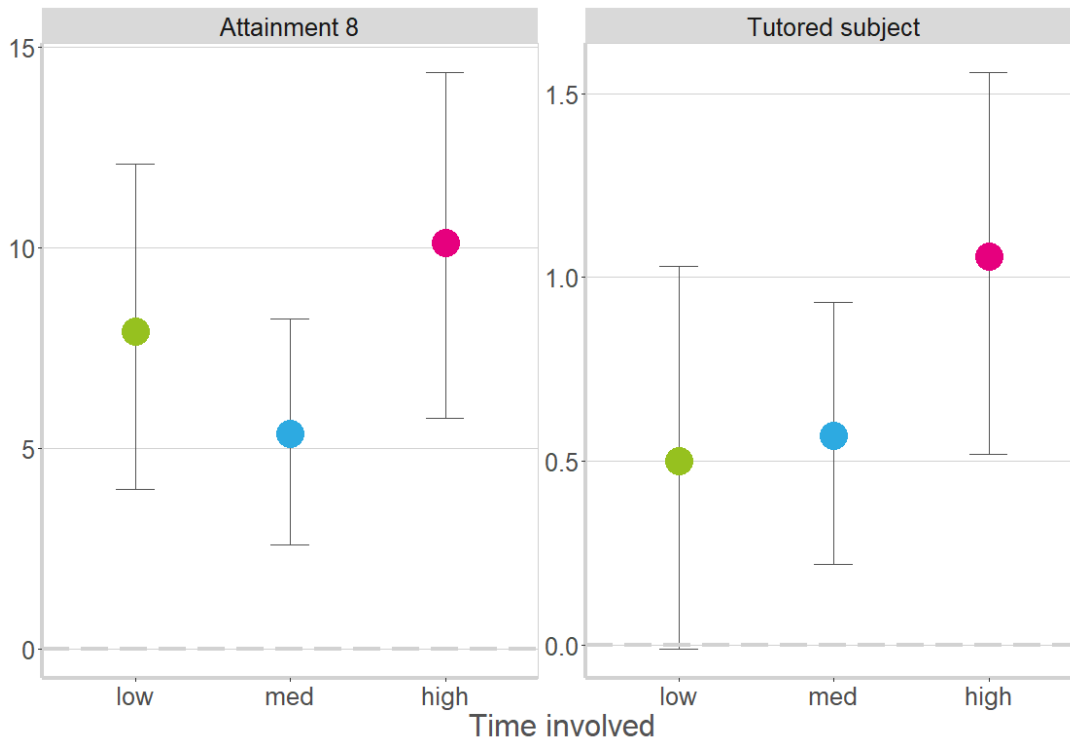
Table 12: Estimated effect of TAP tuition on KS4 attainment, by dosage

Outcome	Dosage	Lower CI	Estimate	Upper CI	Effect size	Months of progress	Number of pupils
Attainment 8	Low	3.98	7.92	12.08	0.43	5	156
Attainment 8	Med	2.60	5.36	8.24	0.29	4	282
Attainment 8	High	5.76	10.12	14.37	0.55	7	134
Tutored subject	Low	-0.01	0.50	1.03	0.26	3	156
Tutored subject	Med	0.22	0.57	0.93	0.29	4	282
Tutored subject	High	0.52	1.06	1.56	0.54	7	134

These results provide evidence that TAP tuition has a positive effect on GCSE attainment in the tutored subject for students who attended either a medium or high number of sessions. We would estimate that a pupil who attended a medium number of sessions would achieve 0.57 of a GCSE grade more than a control pupil, and a pupil who attended a high number would achieve over a grade (1.06) more than a control student. As neither of the confidence intervals contain zero, both are statistically significant. However, there was no significant effect for pupils who attended a low number of sessions.

Looking at Attainment 8, there was a significant difference in attainment for all TAP pupils. We would estimate that a pupil attending a high number of sessions would make five months more progress than a matched control pupil. However, surprisingly, the effect on those students who attained a low number of sessions is nearly as high, the equivalent of four months of additional progress, despite the lack of a significant effect on grade in the tutored subject.

Figure 10: Estimated effect of TAP tuition on KS4 attainment, by dosage



6.2 Year 13 pupils

Estimates of the impact of TAP tuition on attainment at A-Level, broken down into level of dosage, are shown in table 13 and figure 11. Dosage is here defined as the number of tuition sessions attended by a pupil during Year 13, categorised into *low* (ten sessions or less) *medium* (between ten and twenty sessions) or *high* (twenty sessions or more).

Table 13: Estimated effect of TAP tuition on KS5 attainment, by dosage

Outcome	Dosage	Lower CI	Estimate	Upper CI	Effect size	Months of progress	Number of pupils
Best 3	Low	0.01	1.10	2.18	0.25	3	130
Best 3	Med	-0.35	0.79	1.95	0.18	2	184
Best 3	High	-0.70	0.72	2.07	0.17	2	112
Tutored subject	Low	-0.34	0.09	0.52	0.07	1	130
Tutored subject	Med	-0.26	0.11	0.46	0.08	1	184
Tutored subject	High	-0.03	0.45	0.95	0.32	4	112

These results do not provide conclusive evidence that TAP tuition has a positive effect on A-Level attainment for students at any dosage level. None of the estimates for tutored subject are significant, and so we cannot be confident that there is any effect.

However, as for Year 11 pupils, the estimated effects on grade in the tutored subject were higher for students who attended more sessions. The estimated effects on best three scores had very wide confidence intervals, but the estimated effect size was actually highest for those pupils who attended a low number of sessions.

Figure 11: Estimated effect of TAP tuition on KS5 attainment, by dosage

