NFER
National Foundation for Educational Research
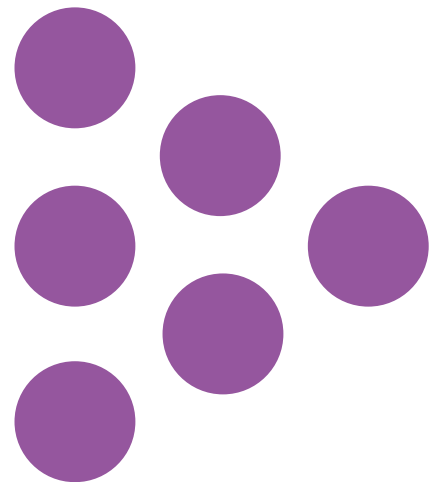
The University of Cambridge 2016-18 Sutton Scholars Cohort: GCSE Outcomes

National Foundation for Educational Research (NFER)

The University of Cambridge 2016-18 Sutton Scholars Cohort: GCSE Outcomes

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1 Introduction

1.1 The Sutton Scholars Programme

The National Foundation for Educational Research (NFER) was commissioned by the Sutton Trust ('the Trust') to carry out an evaluation of the Sutton Scholars programme for the 2016-2018 cohort. The Sutton Scholars programme was targeted at highly-able but socially-disadvantaged secondary school students. It offered enrichment activities delivered through universities which aimed to increase the chances of bright students from disadvantaged backgrounds accessing selective universities. The Trust developed a theory of change for the programme (see Appendix A), which stated that the desired outcomes for students included:

- familiarisation with the university concept and environment

- understanding of the benefits of selective universities and confidence that selective universities are an option for them

- broadened academic knowledge and interest

- feeling supported to choose relevant GCSE and A-Level courses

- feeling supported to navigate the HE system and to make informed choices about HE

- maintained or improved academic trajectories

- achievement of academic potential and GCSE grades that allow applications to selective universities.

The University of Cambridge started a two-year programme in the 2016-17 academic year with students in Year 9 (age 13-14). They were in Year 10 (age 14-15) when they completed the programme in 2018.

1.2 The evaluation

The main aims of the evaluation were to investigate:

- the attitudes of participating students towards education

- students' expectations for higher education

- the academic progress of students during the programme and whether they achieve GCSE grades that place them on a pathway that will allow them to apply for selective universities in the future.

The first two aims were investigated by conducting a baseline and end-point survey of participating students. These findings have been reported to The Trust in separate reports. This report focusses on the findings relating to an analysis of the University of Cambridge's 2016-18 Sutton Scholar's students' GCSE outcomes (examinations taken in the summer 2019). It compares the probability of

the Sutton Scholars cohort achieving at least 5 grades 5-9 at GCSE compared with a matched comparison group of non-participating students, using GCSE data obtained from the National Pupil Database. A total of 73 students were in both groups (the Sutton Scholars group and the matched comparison group). More details about the methodology can be found in the Technical Appendix B.

2   Results

The results from the data analysis show that this student cohort of the University of Cambridge's 2016-18 Sutton Scholars programme (the 'intervention' group) had a significantly higher estimated probability of achieving at least 5 grades 5-9 at GCSE compared with the matched comparison group of students who had similar characteristics (see Table 1, Table 2 and Figure 1). This indicates that these students who participated in the University of Cambridge's 2016-18 Sutton Scholars programme were likely to achieve the GCSE grades that place them on a pathway that will allow them to apply for selective universities in the future. It should be noted that it is not possible to make a causal link between students participitating in the programme and their likelihood of achieving at least 5 grades 5-9 at GCSE as there might have been other background contextual factors that contributed to the students' academic development and progress.

Table 1 - Probability of acheiving at least 5 grades 5-9 at GCSE in the comparison and intervention groups

Sutton Scholar	Estimated Probability (95% CI)	N
No	0.71 (0.55, 0.83)	73
Yes	0.96 (0.87, 0.99)	73

Figure 1 - Probability of acheiving at least 5 grades 5-9 at GCSE in the comparison and intervention groups
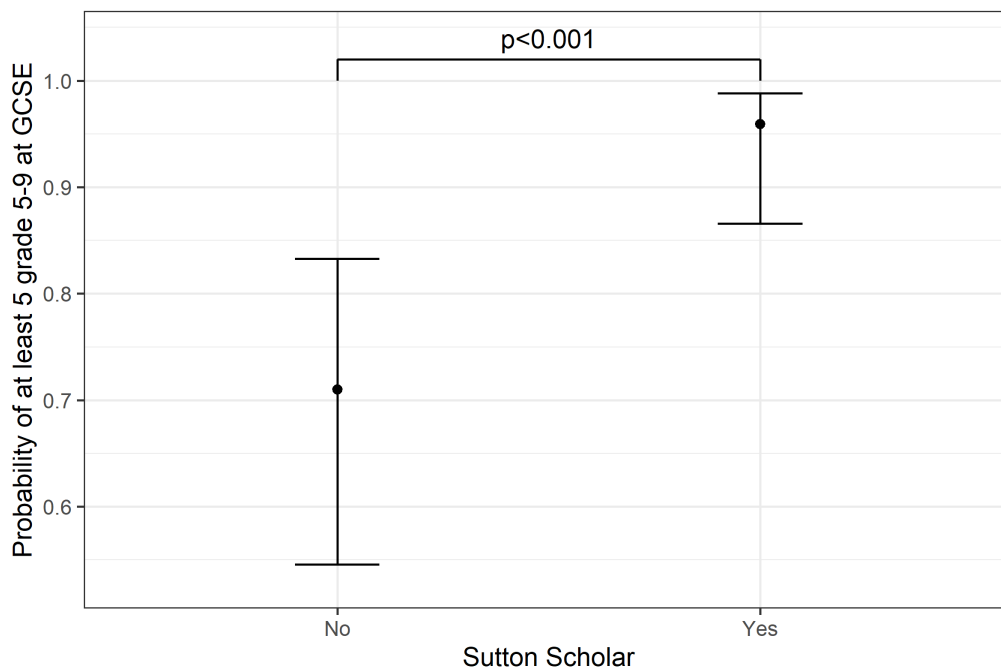
Table 2 - Odds ratio for the contrast between the intervention and comparison group. An odds ratio larger than 1 indicates that the odds of achieving at least 5 grades 5-9 at GCSE are higher in the intervention group (Sutton Scholar = Yes) than in the comparison group (Sutton Scholar = No).

Sutton Scholar	Estimated Odds Ratio (95% CI)	*p*-value	N
Yes/No	9.56 (2.69, 33.99)	<0.001	146

A secondary analysis investigated whether the difference seen between the intervention and comparison group was consistent across genders. It found that there was a larger difference in male students compared to female students, which appears to be driven by a lower achieving comparison group in the male cohort (see Table 3, Table 4 and Figure 2).

Table 3 - Probability of achieving at least 5 grades 5-9 at GCSE in female and male students in the comparison and intervention groups

Sutton Scholar	Gender	Estimated Probability (95% CI)	N
No	F	0.83 (0.60, 0.94)	40
No	M	0.52 (0.27, 0.76)	33
Yes	F	0.97 (0.81, 1.00)	41
Yes	M	0.92 (0.68, 0.99)	32

Figure 2 - Probability of achieving at least 5 grades 5-9 at GCSE in male and female students in the comparison and intervention groups
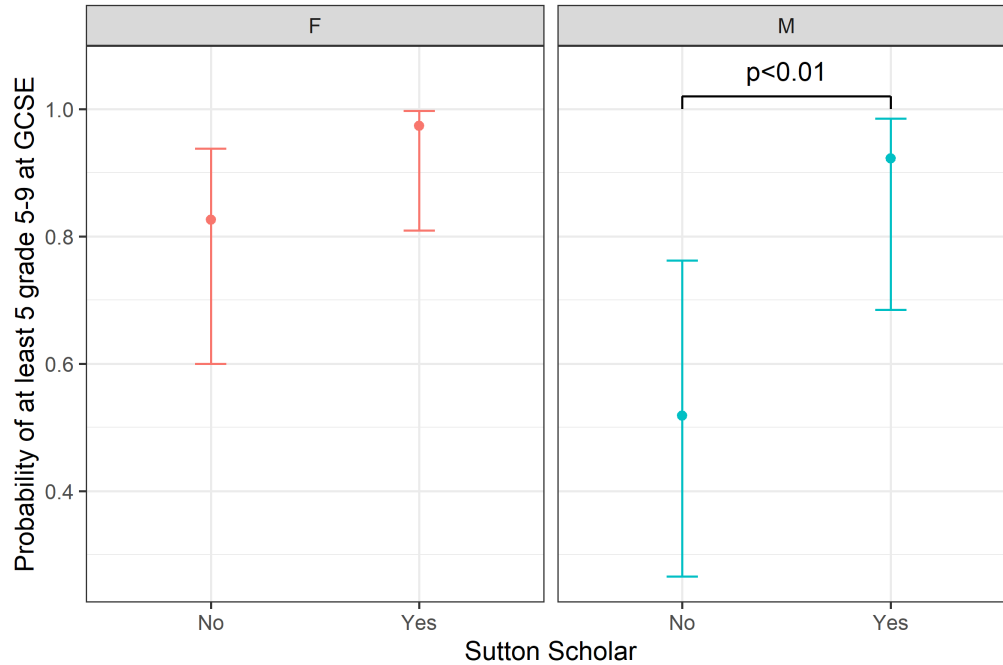

Table 4 - Odds ratios for the contrast between the intervention and comparison group in female and male students. An odds ratio larger than 1 indicates that the odds of at least 5 grades 5-9 at GCSE are higher in the intervention group (Sutton Scholar = Yes) than in the comparison group (Sutton Scholar = No).

Sutton Scholar	Gender	Estimated Odds Ratio (95% CI)	*p*-value	N
Yes/No	F	7.71 (0.84, 70.47)	0.077	81
Yes/No	M	11.09 (1.62, 76.14)	0.010	65

Note that these results apply only to the Cambridge Sutton Scholars programme. The statistical significance of these findings means they would likely be the same for other cohorts participating in the same programme.

Appendix A   Theory of Change

Sutton Trust Sutton Scholars Theory of Change
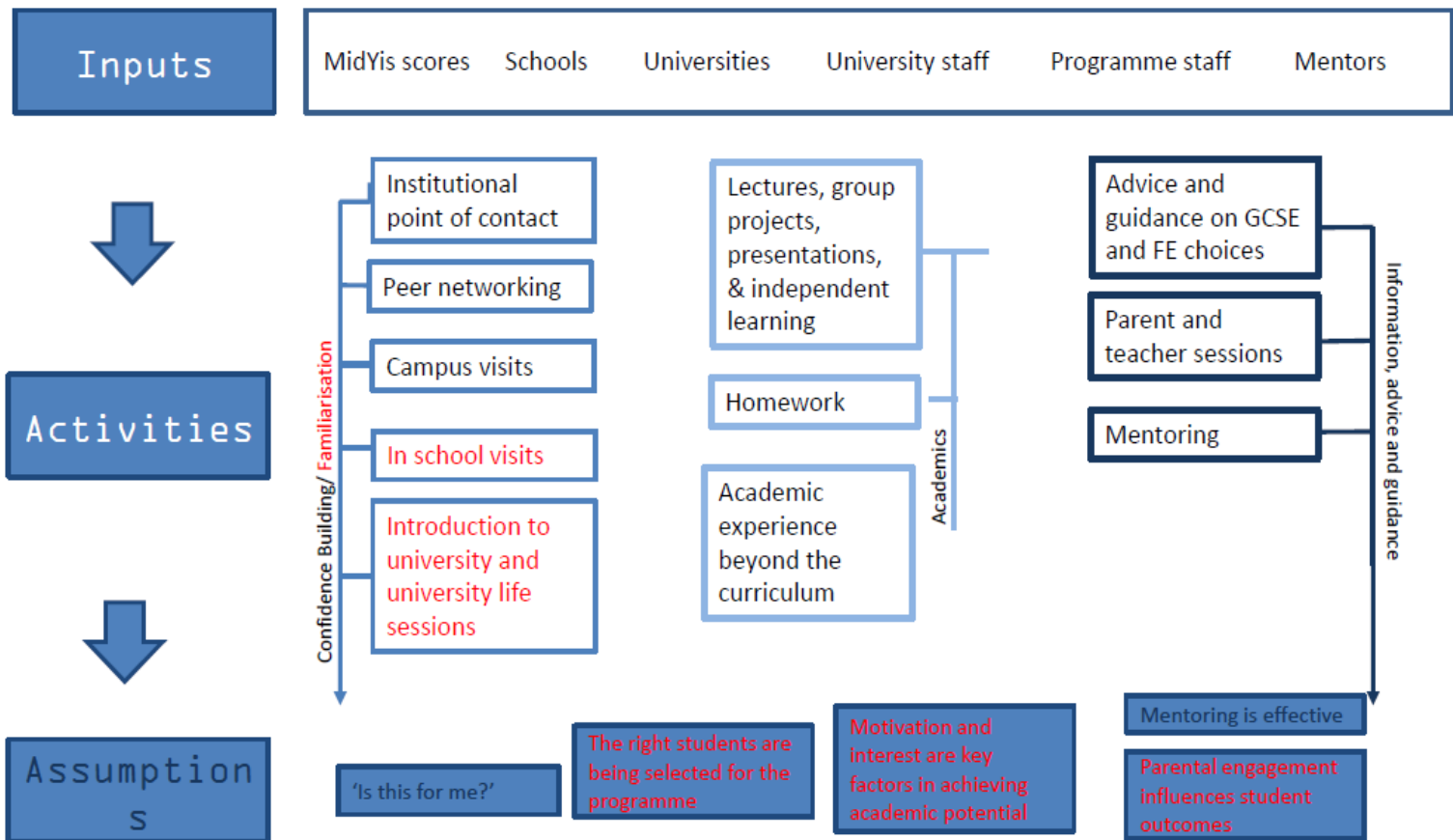
Appendix B   Technical Appendix

Data source

The data source for these analyses was the National Pupil Database[1]. Pupil characteristic and attainment data were utilised for the cohort of pupils undertaking the University of Cambridge's 2016-18 Sutton Scholars programme and a pool of potential matching pupils.

This work was produced using statistical data from ONS. 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.

Statistical matching

Propensity score matching was used to select the pupils that make up the comparison group. This technique aims to select a group of pupils that are highly comparable to the intervention group in all the observed characteristics. The intention is to remove any difference between the groups other than the intervention, allowing differences in outcome to be attributed to the intervention. In practice, it is never possible to observe all variables that may influence selection, so a causal link between the intervention and outcome is unobtainable. Table 5 shows the distribution of the matching characteristics before and after matching was applied. After matching, the distributions in the comparison group are more closely aligned with the distributions in the intervention group. Note that some percentages are recorded with limits to avoid disclosure of personal information.

Table 5 – Results of the matching procedure

Characteristic	Levels	Unmatched Comparison Group (%)	Intervention Group (%)	Matched Comparison Group (%)
Gender	F	46	56	55
Gender	M	54	44	45
Age	Less than 12	34	30	32
Age	Between 12 and 15	27	19	29
Age	Between 15 and 18	22	27	19
Age	Greater than or equal to 18	17	23	21
Ethnic Group	ASIA	<7	<14	<14
Ethnic Group	MIXD	<7	<14	<14
Ethnic Group	WHIT	>86	>72	>72

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[1] https://find-npd-data.education.gov.uk/

Pupil has ever been recorded as eligible for free school meals (FSM) at any time in the last 6 years	No	66	52	58
Pupil has ever been recorded as eligible for free school meals (FSM) at any time in the last 6 years	Yes	34	48	42
IDACI Score	Less than 0.15	18	26	21
IDACI Score	Between 0.15 and 0.3	42	47	40
IDACI Score	Greater than or equal to 0.3	39	27	40
School Admission Policy (2019 onwards)	2	11	<14	<14
School Admission Policy (2019 onwards)	3	89	>86	>86
KS2 Maths	3 or 4	68	22	45
KS2 Maths	5 or 6	32	78	55
KS2 Reading	3 or 4	51	15	25
KS2 Reading	5 or 6	49	85	75
KS2 GPS	3 or 4	57	15	23
KS2 GPS	5 or 6	43	85	77
Number of Pupils		146	73	73

Analysis methodology

The outcome of interest was a pupil level binary indicator of achieving at least 5 grades 5-9 at GCSE. This was fit as the response in a binomial generalised linear model with a logit link. The key explanatory variable was whether the pupil participated in the Sutton Scholars programme. Matching variables were included as covariates. The probability of achieving the outcome was estimated with 95% confidence intervals for comparison and intervention groups. The odds ratio for

the comparison between intervention and comparison groups was estimated with 95% confidence intervals and a *p*-value for difference from 1. For the secondary analysis, another binomial GLM was fit with intervention group, gender and their interaction as the key explanatory variables. Probabilities were estimated for all combinations of intervention group and gender. Odds ratios were estimated for the comparison between intervention and comparison groups within each level of gender. A 5% significance threshold was used throughout.

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