

Access and Participation Evaluation



UNIVERSITY OF
BATH

Analysing the effect of University of Bath widening
access summer schools on progression to HE

Matt Dickson, Rianna Elmhirst, Chris Mining & Harbir

Bal

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Contents

Summary	2
Introduction	3
Evidence on impact of summer schools on outcomes	3
Differential impacts and evaluation approaches	4
Study rationale	4
Methodology	4
Higher Education Access Tracker (HEAT)	5
Participants.....	5
Data processing and analysis	6
Ethics	7
Results	7
Enrolling in Higher Education.....	8
Enrolling at a high-tariff institution	9
Enrolling at the University of Bath.....	10
Heterogeneous effects for different student groups	11
Discussion	13
Impact of summer school attendance on high-tariff university applications, including University of Bath 14	
Correlation between summer school attendance, student characteristics and application rates	15
Conclusion	15
References	16
Appendices	19
Appendix A: Access and Participation Plan and Risks to Equality of Opportunity	19
Appendix B: Descriptive statistics of dataset	19
Appendix C: Regression coefficients from model	20

Summary

This report presents findings from an evaluation of University of Bath's summer school residential programmes between 2015/16 and 2018/19. It forms part of ten research projects listed in Bath's Access and Participation Plan, designed to provide deeper understanding of systemic risks and barriers to equality of opportunity that disadvantaged students may face. For more details see Appendix A.

The evaluation explored the effectiveness of a summer school residential at Bath on students' entry to Higher Education (HE), their likelihood of attending a high-tariff institution¹, and their likelihood of attending the University of Bath in particular. Utilising data held in the Higher Education Access Tracker (HEAT), the analysis was performed to review participant and non-participant trajectory into HE via propensity score matching (PSM) and regression analysis.

Key findings

- **HE progression was higher among Bath summer school participants**, with modelling suggesting a +6.3pp increase in likelihood of enrolling in HE once socio-demographic characteristics are controlled for.
- **Progression to high-tariff institutions was slightly higher for Bath summer school participants** (+4.0pp in the adjusted model), though this effect was not consistently statistically significant.
- **The strongest high-tariff effects were for students from low HE participation areas**, with substantial gains for POLAR Q1 (+17.6pp) and Q2 (+18.4pp) participants compared with non-participants from similar low participation areas and with similar individual socio-demographic characteristics.
- **Progression to the University of Bath was significantly higher among participants**, with a +4.3pp increase in likelihood of enrolment after controlling for individual characteristics.
- **Impacts were not uniform across groups for progression to Bath**, with larger effects for male than female students, significant effects for White participants but not other ethnicities, and no significant difference by disability status.

Considerations

- The voluntary nature of participation in a Bath summer school presents difficulties in evaluating the effects of the programme – any observed differences in outcomes between those who participate and those who do not could be because those who participate have unobserved characteristics that make them more likely to enter HE and in particular a high-tariff institution regardless of whether they attend a Bath summer school or not. However, in this case, both participants and non-participants applied to attend a University of Bath summer school (with around 55% actually attending), and as such we can be more confident that the participants and non-participants are similar in their unobserved characteristics, and the observed differences in outcomes are primarily due to the effects of summer school attendance at the University of Bath.

¹ For definition of high tariff institution see Office for Students typologies at https://www.officeforstudents.org.uk/media/905cacf5-a733-4e21-b49f-67aad785e610/provider-typologies-2022_dec2022-update.pdf

Introduction

Despite recent increases in Higher Education (HE) participation, substantial disparities in who attends HE for undergraduate study remain. In 2023/24, 29% of students eligible for free school meals (FSM) entered HE, representing a twenty percentage point gap compared with non-FSM peers. For high-tariff institutions¹, the HE access gap was nine percentage points (14% for non-FSM, 5% for FSM; Department for Education, 2024) hence non-FSM students are almost three times as likely to attend a high-tariff institution compared to FSM students. These disparities remain despite significant sector investment in widening access and participation (House of Commons Library, 2025). Overall access to HE has increased, but the evidence of the benefits of widening participation (WP) initiatives continues to be mixed (Austen et al., 2021; Baines et al., 2022). This underscores the continued importance of reviewing the impact of WP initiatives and informs the development of effective initiatives for future cohorts.

While prior academic attainment accounts for much of the participation gap (Chowdry et al., 2013), inequalities persist even when attainment is controlled for (Anders, 2012; Boliver, 2013, Campbell et al., 2022). This suggests that factors beyond attainment continue to limit equitable access. Residential summer schools are a widely adopted widening access intervention within the UK, intended to address multiple, well-evidenced barriers that include aspirations/expectations, subject and HE knowledge, academic and social confidence and sense of institutional belonging (Transforming Access and Student Outcomes in Higher Education (TASO), 2022).

Summer schools vary in format, subject focus and delivery, with some being single interventions and others part of a multi-component programme (The Engineering Development Trust (EDT), 2025; The Sutton Trust, 2025). Programmes typically include workshops, taster sessions, information, advice and guidance, and social activities, and are most often available to Year 12 students (students usually apply during year 12 and attend during the summer between year 12 and 13), aligning with key HE decision-making timelines. Enabling students to experience university life first hand on campus or virtually has shown to strengthen motivation and future orientation toward HE (TASO, 2023). However, despite the prevalence, robust evidence on long-term outcomes remains limited.

Evidence on impact of summer schools on outcomes

UK evidence generally suggests that summer school participation is positively associated with intermediate outcomes, such as confidence, aspirations and awareness of HE (Robinson & Salvestrini, 2020; TASO, 2023). Evaluations of Aimhigher and regional programmes report improved confidence in applying to university and greater understanding of HE environment, application processes and institutional differences (Doyle & Griffin, 2012; Hatt et al., 2009). Nonetheless, Aimhigher utilised a multi-intervention approach, whereby summer schools may have featured in conjunction with other initiatives like university campus visits, masterclasses, lectures and/or mentoring.

However, short-term gains may not be sustained without continued support. Structural barriers such as financial and familial constraints may persist, and improved attitudes alone may not equip students with the practical skills required to navigate application and enrolment processes. Furthermore, broader historical, social, and political contexts shaping students' educational trajectories require intervention beyond short-term constructs like aspirations (Benson-Eggleton, 2022; Bowers-Brown et al., 2019). This highlights the importance of examining long-term outcomes alongside immediate feedback.

Evidence of the relationship between summer school participation and HE applications or enrolments is limited and mixed (Higher Education Funding Council for England (HEFCE), 2010; Hoare & Mann, 2011; Robinson & Salvestrini, 2020). Sector reviews suggest associations with higher HE progression and influence on choice of institution or subject but emphasise the scarcity of causal evidence and the risk of selection bias (TASO, 2023; The Sutton Trust, 2015). Trials conducted by TASO indicate that participants are often already HE-inclined, raising concerns that impacts may be overstated when evaluations rely primarily on attitudinal outcomes (TASO, 2023).

A key gap in current literature concerns the institutional destinations of summer school participants. Hoare and Mann (2011) reported higher attendance at “leading universities” among summer school participants compared to non-participants. However, most evaluations focus on HE entry rather than differences in progression by institutional selectivity (Gorard et al., 2012; Robinson & Salvestrini, 2020).

Differential impacts and evaluation approaches

HE participation is highly stratified by prior attainment, socio-economic status and demographic characteristics (DfE, 2025; Office for Students (OfS), 2023; UCAS, 2025). Prior attainment and socio-economic status explain most variation in HE participation (Crawford & Greaves, 2015; Gorard et al., 2012), alongside factors like school type, parent/child attitudes and behaviours, family background, and parental education (Chowdry et al., 2011; Goodman & Gregg, 2010; Gorard et al., 2019; The Sutton Trust, 2010). Despite this, evidence on differential impacts of summer schools across student groups remains limited. While some studies report positive effects on motivation and self-efficacy, subgroup analyses are rare and findings inconsistent (TASO, 2023). International evidence similarly suggests variation in impact by socio-economic background (Monfrance et al., 2024).

Methodologically, evaluation in this area faces challenges. Experimental approaches remain difficult to achieve, and recent trials have been constrained by attrition, small samples and imbalances across characteristics (TASO, 2023; Younger et al., 2019). In response, studies have increasingly used administrative data and quasi-experimental methods to model counterfactual outcomes, including predictive modelling and matched comparisons using UCAS and Higher Education Statistics Agency (HESA) data (Horton, 2023; Martin, 2024; Williams & Mellors-Bourne, 2019).

Study rationale

Building on this foundation, the present evaluation uses pooled administrative data across multiple years to examine the impact of participation in a University of Bath summer school on progression to high-tariff UK institutions. By applying a quasi-experimental approach, this study seeks to strengthen evidence on long-term outcomes and institutional destinations.

Methodology

Our quasi-experimental approach compared the outcomes of a group of students who participated in a University of Bath summer school to similar students who applied to the summer school but did not participate. The data covers the years 2015/16 to 2018/19, at the time, the most recent HESA-tracked data within the HEAT system.

Research questions

The analysis aims to address the following research questions:

1. Does attending a University of Bath, Year 12, residential summer school programme impact student's enrolling to HE, high-tariff institutions and/or the University of Bath?
2. Are there different sized effects on these outcomes for different student groups who attend a University of Bath, Year 12, residential summer school?

Higher Education Access Tracker (HEAT)

HEAT is a UK-based system used to record outreach participation and longitudinally track participation and educational outcomes. Data held within HEAT can be linked to national administrative databases, most notably HESA, enabling institutions to monitor participants' HE progression.

By tracking students who take part in Bath summer school programmes we can observe whether they entered HE after 16-18 study. All applicants to a Bath summer school are uploaded to HEAT, regardless of attendance. Those that do not attend, either due to eligibility criteria or non-engagement, are used as the comparison group.

Participants

Data from 11 Bath summer schools were included in the analysis, equating to 1803 applicants. The dataset supplied each applicant's gender, disability status, ethnicity and whether they are a young carer. It also included area-based measures as proxies of socio-economic status: Index of Multiple Deprivation (IMD), POLAR, and IDACI quintiles. Finally, for those who go on to HE there are fields recording Key Stage 5 attainment in the form of UCAS points and HE destination (Table 1).

Students self-select into applying for a Bath summer school. Participants for the Bath summer schools were selected from the applicant pool based on meeting the widening participation criteria (POLAR Quintile 1 or 2, IMD Quintile 1 or 2 or part of a marginalised group) and having the academic potential to access university.

Table 1: *Details of fields within the HEAT/HESA dataset*

Field	Description
Ethnicity	Sourced from HESA variable, Ethnicity. There are 19 codes, these were collapsed into six groups: Asian, Black, Mixed ethnicity, Other, Unknown and White.
Gender	Sourced from HESA variable Gender, which was categorised as Female, Male, Unknown.
High-tariff institution	Using OfS (2022) typology to define HE institution with high average tariff scores.
IDACI quintile²	A measure of neighbourhood deprivation, derived from the postcode. Sourced from HESA variable, IDACIQuintile.
IMD quintile³,	A measure of neighbourhood deprivation, derived from the postcode. Sourced from HESA variable, IMDQuintile.
POLAR quintile⁴	A measure of neighbourhood deprivation, derived from the postcode. Sourced from HESA variable, Polar4YPR.
Socio-economic classification (SEC)	Sourced from HESA variable, SEC. This variable is based on the standard occupational coding (SOC) of the students' parent/guardian for students aged under 21, or the SOC of the students themselves if aged 21 or over at the start of their studies.

² IDACI definition: <https://www.gov.uk/government/statistics/english-indices-of-deprivation-2025/english-indices-of-deprivation-2025-statistical-release>

³ IMD definition: <https://www.gov.uk/government/statistics/english-indices-of-deprivation-2019>

⁴ POLAR definition: <https://www.officeforstudents.org.uk/data-and-analysis/young-participation-by-area/about-polar-and-adult-he/>

UCAS points⁵	Calculated based on HESA variable, top four A-levels. Each A level grade is provided a numerical value which is added up to create a UCAS points score.
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Some participants had incomplete records, with some missing data fields, mainly affecting the categorical variables IDACI, IMD, POLAR and SEC. For each of these variables we include an additional dummy variable for the missing category. This affects between 4% (POLAR, IMD) and 11%-12% (IDACI, SOC, ethnicity) of the estimation sample. The other variable affected by missingness is UCAS points which is missing for those who do not go on to HE and is also missing for a small proportion of those who do. Rather than impute a missing value for UCAS points, we exclude these observations from the estimation sample for the models of attending the University of Bath or attending a high-tariff institution.

The dataset contains 1,803 observations, 863 (47.9%) of which are from individuals who participated in a Bath summer school, 940 (52.1%) are from those who did not. Of these 1,803 individuals, 1,555 went on to attend HE (86.3%), 248 (13.7%) did not. This full sample can be used for the model of attending HE. For the models of attending a high-tariff institution or the University of Bath in particular, we restrict the sample to those who attended higher education and for whom we have the UCAS points score. This reduces the sample to 1,175 individuals, 650 (55.3%) of whom participated in a Bath summer school, 525 (44.7%) did not. The full participant and comparator characteristics can be found in Appendix B.

Data processing and analysis

Several steps were taken to prepare the dataset for analysis. Firstly, data related to summer school descriptions were extracted from HEAT, with all other activities or those that were not tracked via HESA removed. Secondly, UCAS tariff points were calculated based on the HESA populated field “top four A-levels” for each student. Thirdly, HE institutions were coded according to whether they were high-tariff or not, using a typology from the OfS (2022).

To strengthen the comparison between summer school participants and non-participants we used propensity score matching (PSM). This method runs an initial logistic regression model to predict participation in a Bath summer school based on individual characteristics – we included the same characteristics as in our main estimation model (see below for full list of covariates included within the model).⁶ For each individual in the analysis sample, the model then reports their predicted probability of participation based on their characteristics. We retain individuals in the comparator group if they are one of the three non-participants with the nearest propensity score to one of the summer school participants. We further ensure comparability by dropping treatment observations whose propensity score is higher than the maximum or less than the minimum propensity score of the non-participants. This procedure removes from the comparison group individuals who, based on their characteristics, do not have a similar probability of participating in the Bath summer school as any of the actual participants.

For our model of attending HE, the PSM removes 354 individuals from the comparison group; for our model of attendance at a high-tariff institution or at the University of Bath, PSM removes 130 individuals from the comparison group. As such, the analysis sample for the model of attending HE has 1,449 individuals, 863 (59.6%) of whom are Bath summer school participants, 586 (40.4%) are non-participants. The analysis sample for the models of attending the University of Bath or attending a high-tariff institution contains 1,045 individuals, 650 (62.2%) of

⁵ UCAS points are not available for students who do not attend HE, therefore this variable cannot be included in the model for HE attendance.

⁶ We ran two separate PSM procedures: one for the model of attending HE, and another for the model of attending either the University of Bath specifically or another high-tariff institution. We did this as the total samples are different for each, and the covariates included in the model also differ for each, as we cannot control for UCAS points in the model for attending HE.

whom participated in a Bath summer school, 395 (37.8%) did not. By creating similar participant and non-participant groups, PSM helps ensure that observed differences in HE progression and other HE outcomes are more likely to be due to the programme rather than pre-existing differences between students who do and do not participate in a Bath summer school.

Next, we posit a statistical model of the relationship between attendance at a Bath summer school and the outcomes of interest: attending HE, attending the University of Bath, attending a high-tariff institution. We estimate these relationships, using our samples derived from the PSM process, and controlling for individual characteristics: gender, ethnicity, disability status, young carer status, POLAR quintile, IMD quintile, IDACI quintile, SOC category, and for the latter two models, the UCAS tariff points. In all models we also control for the year the individuals applied to/attended the Bath summer school. We control for these particular characteristics as previous research has consistently shown that these factors tend to be predictive of the likelihood of progression to HE, and particularly to high-tariff institutions (Crawford & Greaves, 2015; Martin, 2024; Montacute & Cullinane, 2023; Richardson et al., 2020). If we did not control for these factors then our estimated effect of attending a summer school would be biased upwards, as these characteristics are also associated with attending a summer school.

We estimate a linear probability model of attending HE, attending the University of Bath, and attending a high-tariff institution, and report the coefficient estimates which provide the marginal effect of attending a Bath summer school on the outcome, comparing students who have the same values of the other characteristics included in the model.⁷

Ethics

A favourable ethics decision for this evaluation was received in December 2024 from the University of Bath's Social Science Research Ethics Committee.

Results

The data and analysis aims to ascertain whether participants of a University of Bath summer school programme are more likely to progress to HE, a high-tariff institution or the University of Bath than might otherwise be expected given their socio-demographic characteristics.

A simple comparison was made as to whether Bath summer school participants were more likely to progress to the three HE scenarios (Table 2). Overall, 87% (n=1,260) of students in the analysis sample for HE attendance progressed to HE. There is a difference in progression rate between those who did and did not attend a Bath summer school: 88.9% for those who did attend, 84.1% for those who did not. Looking at the sub sample of those who do attend HE and have UCAS points data available, overall, 63.9% progress to a high-tariff institution, but again there is a notable difference between the progression rate for those who attended a Bath summer school (67.9%) and those who did not (57.5%). Likewise for progression to the University of Bath, overall, 7.9% of the sample attended Bath, with a markedly higher progression rate for those who attended a Bath summer school (9.2%) than those who did not (5.8%).

Table 2: *Comparing rates of progression between Bath summer school participants and comparator (summer school applicants and non-attendees) in the main analysis samples (post PSM).*

⁷ Results are robust to using limited dependent variable models i.e. logistic regression.

	Sample	HE progression	Sub-sample of HE attendees	High-tariff progression	Bath progression
Participants	863	767 (88.9%)	650	441 (67.9%)	60 (9.2%)
Comparator	586	493 (84.1%)	395	227 (57.5%)	23 (5.8%)
Total	1,449	1,260 (87.0%)	1,045	668 (63.9%)	83 (7.9%)

However, as noted above, these higher progression rates to HE, to a high-tariff institution, and to the University of Bath in particular for Bath summer school attendees, cannot be attributed solely to the summer school participation. There are other confounding variables – socio-demographic characteristics and prior attainment – that are related to both summer school participation and the outcomes of interest and need to be considered when making the comparison. Therefore, we estimate our statistical models to control for the effects of these characteristics and derive estimates that compare ‘like with like’ students. We report the estimates from the linear regression model estimated on the sample obtained after the PSM but estimates for the full samples are also reported in Appendix C and confirm the main results.

Enrolling in Higher Education

The model estimate of the effect of attending a University of Bath summer school on enrolling in HE is to increase the probability by 6.3pp, with all other characteristics held equal. Controlling for the effects of individual characteristics, the conditional probability of enrolling in HE amongst non-participants is 83.2%, which increases to 89.5% for summer school participants (Figure 1). The estimated effect is significant at the 1% level of significance.

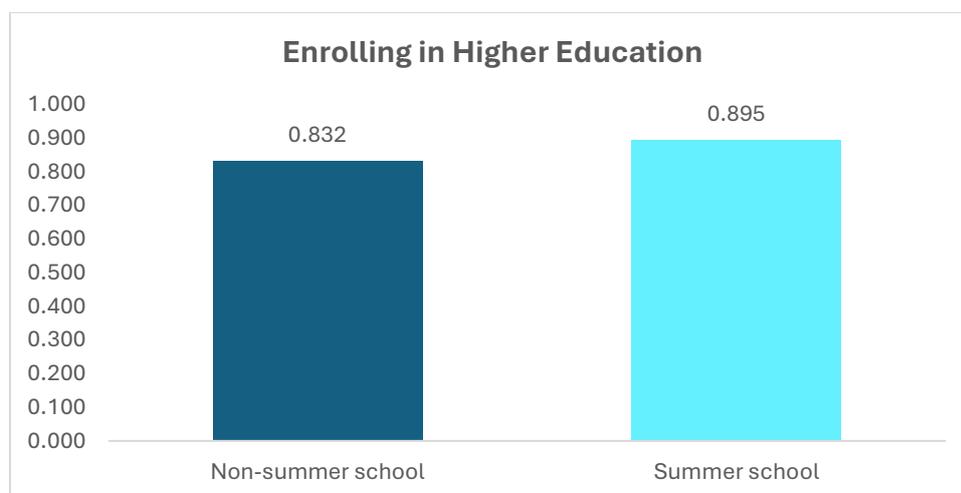


Figure 1: Estimates from full linear probability model on enrolling to HE ($n = 1,449$, $R^2=0.3522$). Block colour bar shows statistically significant results.

Interestingly, the conditional estimated effect of 6.3pp is higher than the raw difference in progression rate between Bath summer school participants and non-participants which was 4.8pp (see Table 2). This suggests that the non-participants have characteristics that promote HE enrolment more so than the Bath summer school participants, such that in the raw comparison the summer school effect is biased downwards. Once we control for these characteristics and compare participants and non-participants with the same socio-demographics, the summer school effect is shown to be even larger. This estimate for the post-PSM sample ($n=1,449$) is almost the same as the estimate on the larger sample before undertaking the PSM ($n=1,803$) where the estimate is a 6.0pp increase, also significant at the 1% level.

One caveat to bear in mind is that for this sample, we cannot control for prior attainment as we do not have the UCAS points measure for those who do not enrol in HE. Should the participants and non-participants differ in their prior attainment, this may bias the estimate. We can investigate this to some extent amongst the sample of those who do go on to HE. Amongst this sample, the participants have higher UCAS points on average (139.9 vs 132.5) – approximately equivalent to one grade better in one A-level.⁸ This is a relatively small difference across four A-levels and as such should not be driving the summer school effect on HE enrolment if the full sample has a similar difference in points between the participants and non-participants. Reassuringly, re-estimating our model for attendance at the University of Bath without controlling for UCAS points only slightly increases our estimate of the effect of summer school attendance, suggesting a small upward bias in our summer school effect when UCAS points are not controlled for. For the model of attendance at a high-tariff institution, failing to control for UCAS points increases the summer school effect more substantially which is perhaps not surprising given that by definition UCAS points score is *the* key determinant of attendance at a high-tariff institution and the impact of UCAS points on high-tariff attendance is larger and much more precisely estimated than in the regression estimates for attending Bath. Given that academic attainment (as proxied by UCAS points) is likely to be much less of a determinant of enrolling at HE *at all* compared with its effect on attendance at a high-tariff institution, this would suggest that our estimated effect of summer school participation on enrolling in HE is unlikely to be substantially biased even though we are unable to control for prior attainment.

Enrolling at a high-tariff institution

Attending a University of Bath summer school is associated with an increase in the likelihood of attending a high-tariff institution, though the increase is not statistically significant at conventional levels. As depicted in Figure 2, the model estimate of the impact of attending a Bath summer school is to increase the probability of attending a high-tariff institution by 4.0pp – increasing it from 61.4% to 65.4%, holding all other things equal. Though not statistically significant in our post-PSM analysis sample ($p=0.17$), in the larger pre-PSM sample the estimated effect is 4.7pp and is marginally statistically significant ($p=0.106$). The raw difference in high-tariff institution attendance between those who did/did not participate in a Bath summer school is 10.4 percentage points, so it seems that much of this difference is driven by differences in the characteristics of those who do/do not participate in a Bath summer school, as once the effects of these characteristics are accounted for, the participation premium reduces by more than half and is not consistently statistically significant. Further analysis shows that unsurprisingly, the driving factor behind the reduction in the summer school effect for high-tariff institution attendance is controlling for UCAS points – just adding this alone to the model reduces the summer school effect from 10.4pp to 5.1pp and increases the explanatory power of the regression, as captured by the model R^2 , from 0.0100 to 0.3209. Adding the rest of the covariates to the model only increases the R^2 to 0.3544.

⁸ The UCAS points system assigns 56 points for an A*, 48 for an A, 40 for a B, etc. Therefore, one A-level grade equates to 8 UCAS points. The average difference between participants and non-participants is 7.4 points

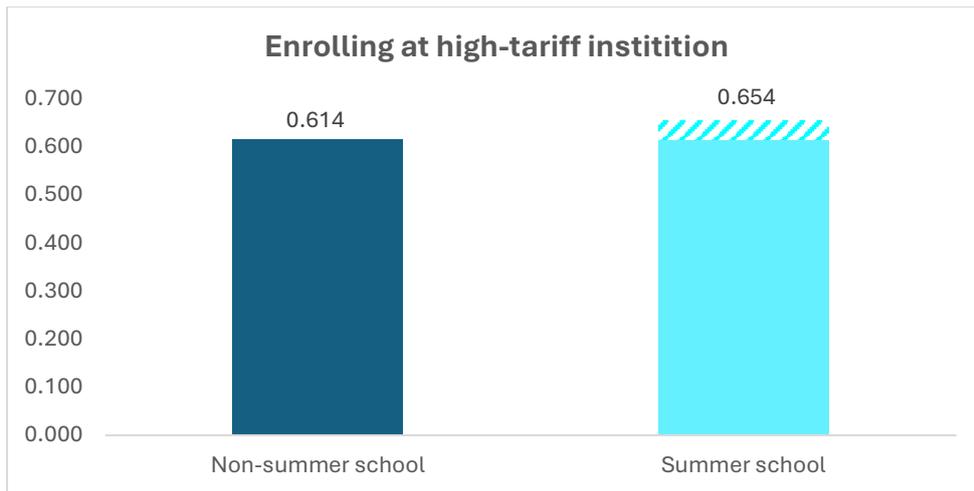


Figure 2: Estimates from full linear probability model on enrolling to high-tariff institution ($n = 1,045$, $R^2=0.3544$). Block colour bar shows statistically significant results; striped bar indicates non-statistically significant difference. The additional effect for summer school participants is non-significant.

Enrolling at the University of Bath

Attending a University of Bath summer school has a positive impact on the probability of attending the University of Bath (Figure 3). Participating in a Bath summer school is associated with a 4.3pp increase in the likelihood of attending the University of Bath, all else equal. Bath summer school participation increases the probability from 5.3% amongst non-participants to 9.5% and is statistically significant ($p=0.017$). This increase in the conditional probability of attending Bath, having considered the impact of individual characteristics, is larger than the raw difference in probability between participants and non-participants which was 3.4pp. As is the case for enrolling in HE at all, compared to Bath summer school non-participants, the individuals who participate in a Bath summer school have characteristics that make them *less* likely to attend the University of Bath, so in the raw comparison the summer school effect is biased downwards. Once we compare like with like students, we see that the summer school effect is in fact larger than the raw data would suggest. The estimated summer school effect using the pre-PSM sample is almost the same (4.0pp) and similarly statistically significant ($p=0.018$).

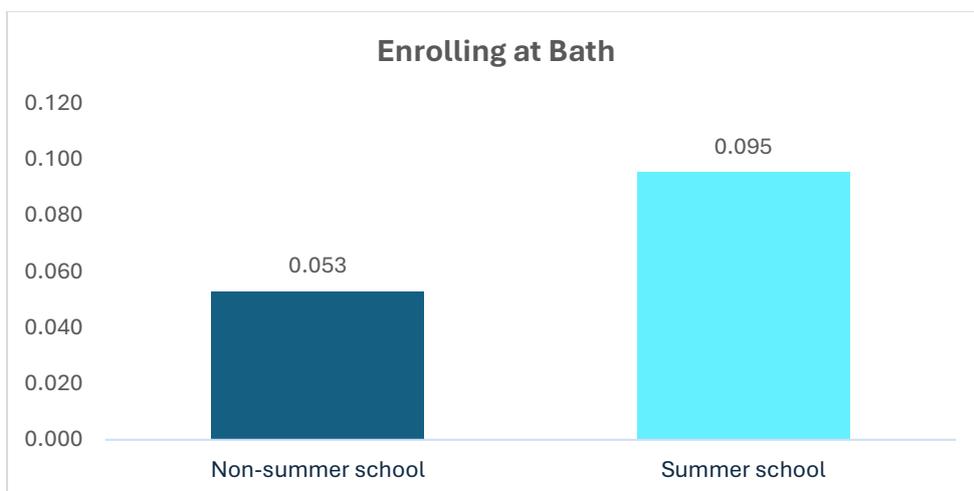


Figure 3: Estimates from full linear probability model on enrolling at Bath ($n = 1,045$, $R^2=0.0568$). Block colour bar shows statistically significant results.

Heterogeneous effects for different student groups

We now go on to look at whether the summer school effect on the probability of enrolling in HE, attending a high-tariff institution, and attending the University of Bath differs for different groups of students based on their characteristics. The groups we investigated were based on gender, ethnicity, disability status, POLAR quintile and IMD quintile.

For enrolment in HE overall, there was little evidence of significant differences between groups. There was however some heterogeneity in the effects of participating in a Bath summer school on attending a high-tariff institution. Here the overall estimated effect of participating in a Bath summer school was 4.0pp though it was not consistently statistically significant at conventional levels. When analysing effects by group, we found that there is a difference in the effect for students from areas with the lowest participation rates in higher education – those domiciled in POLAR quintiles 1 or 2. As Figure 4 shows, holding all other factors constant, summer school participants from POLAR 1 increase their probability of attending a high-tariff institution by 17.6pp compared to similar POLAR 1 students who do not attend a Bath summer school, and for POLAR 2 domiciled students it is an effect of 18.4pp compared to comparable students from an area with similar levels of HE participation but who do not participate in a Bath summer school. In contrast, students from all higher POLAR quintiles do not increase their chance of attending a high-tariff institution by participating in a Bath summer school. This is encouraging as it shows the summer school is positively impacting those from the lowest participation areas – even if the effect in the overall pooled regression was smaller and non-significant, for students from low participation areas, the summer schools are having a substantial positive effect. To put this in context, POLAR 1 and POLAR 2 domiciled students who do not participate in a Bath summer school are 13.9pp and 7.4pp respectively less likely to attend a high-tariff institution than a similar POLAR 5 domiciled student who does not participate. If these POLAR 1 and POLAR 2 students do participate, they respectively become 3.7pp and 11.0pp *more likely* than the non-participating POLAR 5 student to attend a high-tariff institution.

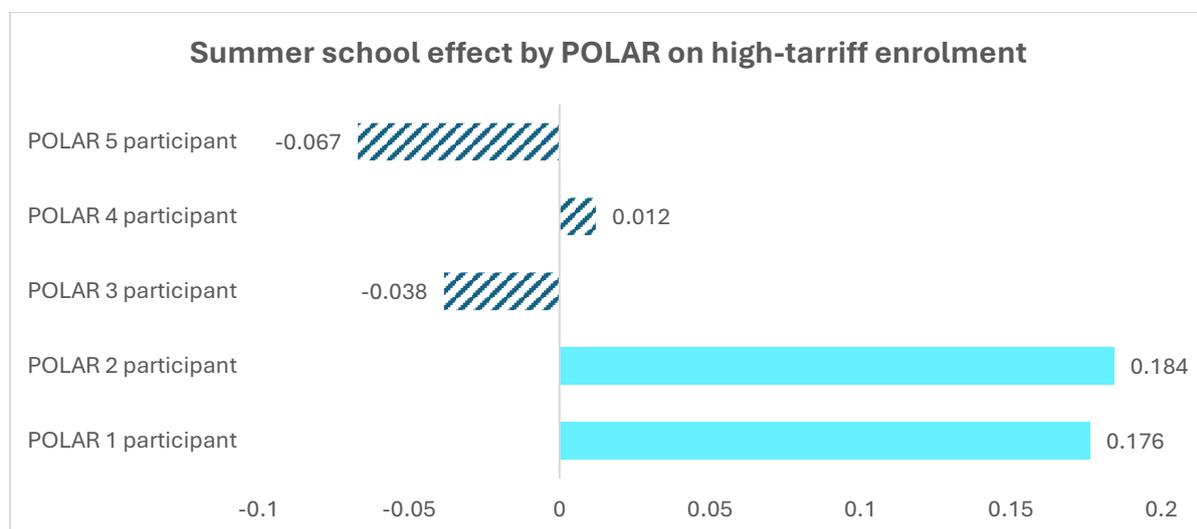


Figure 4: Progression to high-tariff institution by POLAR quintile groupings (n =1,045, R²=0.3646). Block colour bar shows statistically significant results; striped bar shows non-statistically significant results.

We also found heterogeneous summer school effects for the model of attending the University of Bath. Firstly, participating in a Bath summer school significantly increases the chances of both female and male students enrolling at the University of Bath, but the effect is markedly larger for male students (Figure 5).

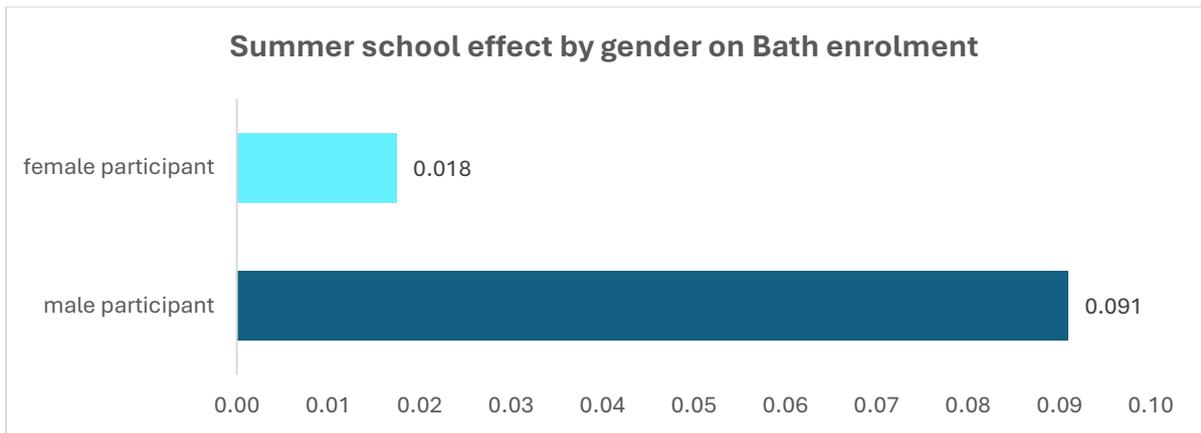


Figure 5: Progression to University of Bath by gender ($n = 1,045$, $R^2=0.0606$). Block colour bar shows statistically significant results.

Attending a Bath summer school did not have a significant impact on progression to the University of Bath for non-white students but it did for white participants (Figure 6), which was statistically significant.

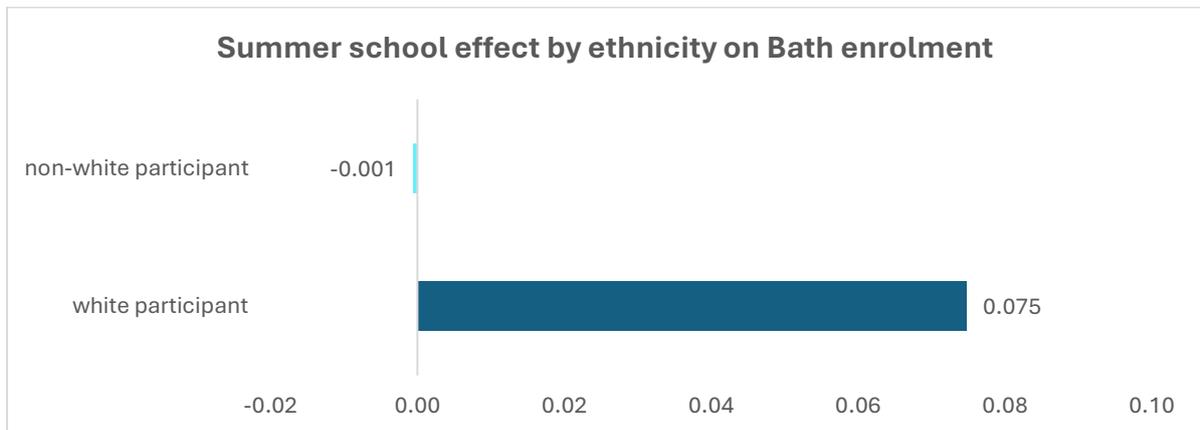


Figure 6: Progression to University of Bath by ethnic group ($n = 1,045$, $R^2=0.0610$). Block colour bar shows statistically significant results.

There was no statistically significant difference in the rates of progression to Bath for those with or without a declared disability (Figure 7) – the estimate is slightly smaller for the disabled participants, but the difference is not significant, which tells us that disabled participants gain the same benefit as non-disabled.

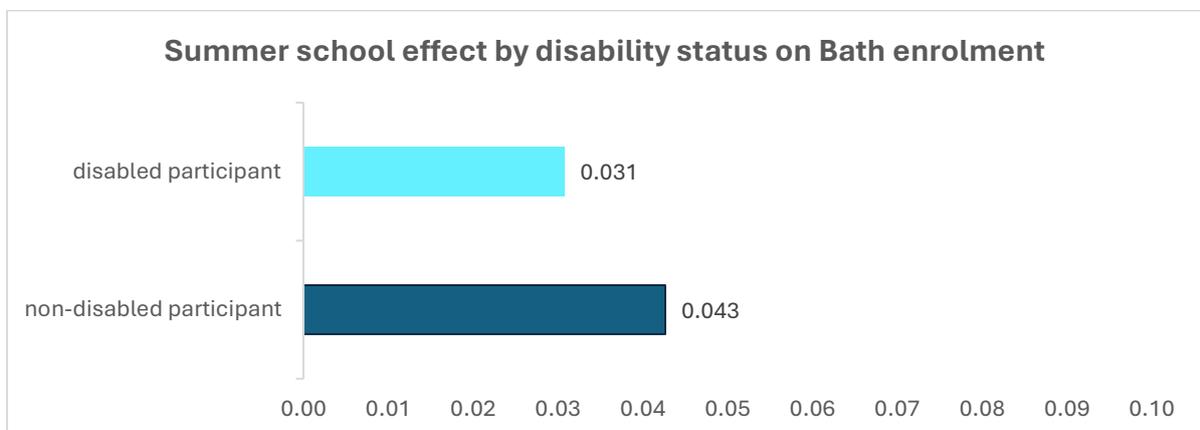


Figure 7: Progression to University of Bath by disability status ($n = 1,045$, $R^2=0.0568$). Block colour bar shows statistically significant results.

When it comes to POLAR quintile groups, again there was heterogeneity though slightly different to the attendance at high-tariff picture (Figure 8). For attending Bath there is a significant effect of the summer school for participants from the middle POLAR quintile, and for the lowest POLAR 1 group the effect is only just outside statistical significance ($p=0.119$). This suggests again that the Bath summer schools are having a greater impact on progression to Bath for those students from the lower participation areas.

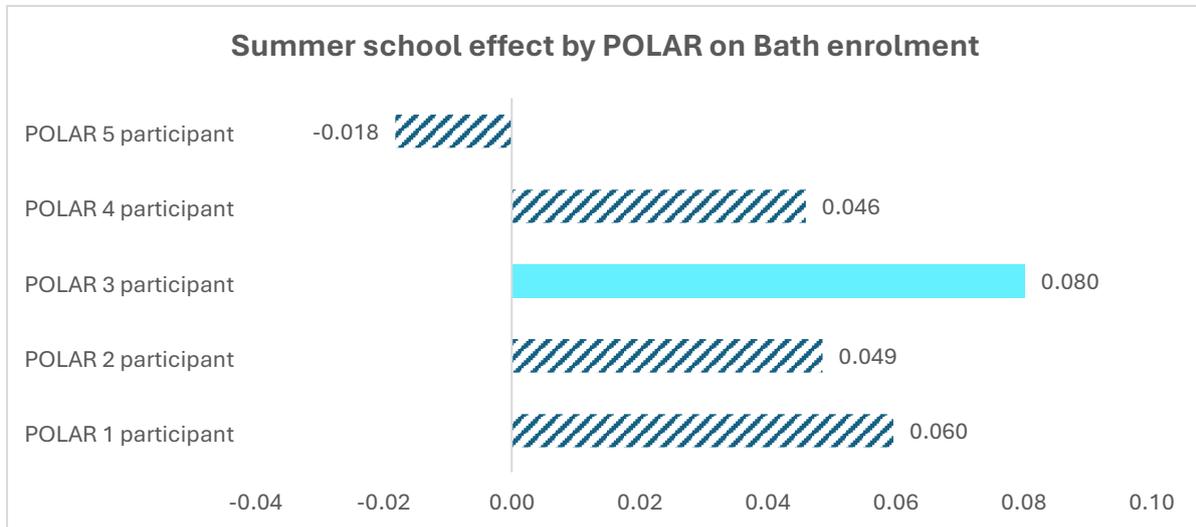


Figure 8: Progression to University of Bath by POLAR quintile groupings ($n = 1,045$, $R^2=0.0604$). Block colour bar shows statistically significant results; striped bar shows non-statistically significant results.

There was no statistically significant difference in the rates of progression to Bath for those within a low socio-economic area (IMD Quintile 1 and 2) compared to those in high (IMD Quintile 3-5) areas, both having a significant positive effect of the summer school of just over 4pp compared to students from the same IMD quintile but who did not participate in a Bath summer school (Figure 9).

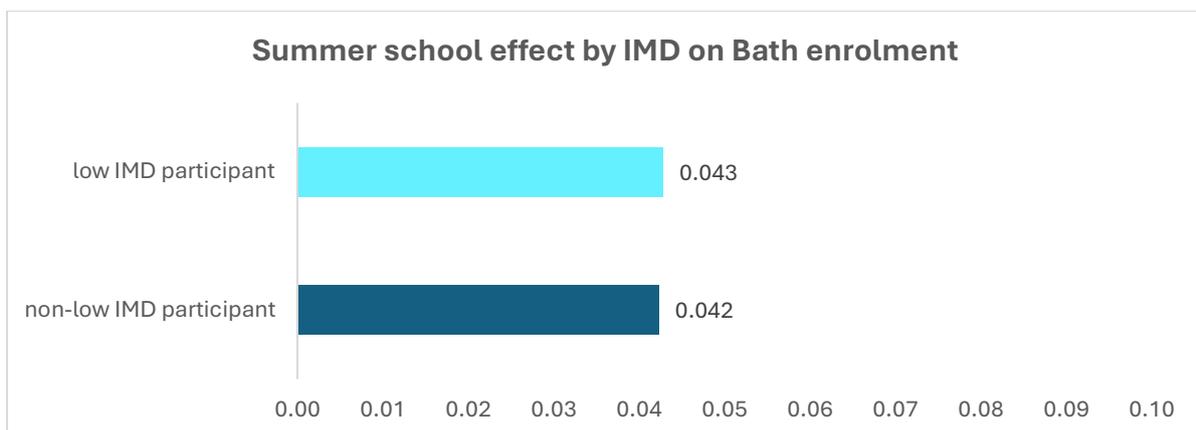


Figure 9: Progression to University of Bath by IMD quintile groupings ($n = 1,045$, $R^2=0.0568$). Block colour bar shows statistically significant results.

Discussion

This analysis set out to understand the impact of University of Bath's, Year 12, residential summer school programmes on students' university application behaviour, and whether it

differs between student groups. The findings presented suggest that there is robust evidence that University of Bath summer school participants are more likely to progress to HE, and more likely to enrol at the University of Bath, and some evidence that they are more likely to enrol at a high-tariff institution, compared to similar students who do not participate in a Bath summer school.

Impact of summer school attendance on HE application rates

There is a positive impact in attending a University of Bath summer school on HE progression, supporting the previous evidence that summer schools are one of the widening participation activities most strongly linked to UCAS application success (Burgess et al., 2021).

Many summer schools in the sector target Year 12 students, a critical but contested intervention point. These students are making imminent HE application decisions yet intervening at this late stage raises questions about whether entrenched attainment gaps and barriers accumulated over years can be meaningfully addressed. TASO (2022) notes that by Year 12, many participants are already interested in attending HE, with 95 per cent reporting they are likely or extremely likely to apply (TASO, 2023). This raises the question of whether summer schools expand access to new populations or primarily serve students already predisposed to attend HE.

Impact of summer school attendance on high-tariff university applications, including University of Bath

There is a positive impact of attending a University of Bath summer school on progression to a high-tariff institution, including University of Bath in particular. While the evidence for progression to high-tariff institutions in general is less robust, the size of the effect is consistent, it is the statistical significance that varies with the choice of estimation sample. Moreover, the heterogeneity analysis reveals that for POLAR 1 and POLAR 2 students there is a strong, positive and statistically significant effect of summer school attendance on progression to a high-tariff institution.

The comparator group of Bath summer school non-participants also have fairly positive rates of progression to high-tariff institutions: a conditional probability of 61.4%. The comparators were students who applied and either did not get on to the Bath summer school due to eligibility or chose not to attend. Those who applied but were ineligible are by definition more likely to be from a more advantaged background than the participant group, which would potentially have a downward biasing effect on our estimate of the Bath summer school effect. The students who were eligible but decided not to attend may have made this choice for a number of reasons. It might be that they were less motivated, in which case this would have an upward biasing effect on our estimates. Alternatively, those eligible but not attending may have attended other interventions or summer schools at other HE institutions which would have a downward biasing effect on our estimates – effectively changing them from being the effect of participating versus no summer school, to the effect of participating in a Bath summer school versus an alternative summer school. In reality, the comparator group are likely to be a mixture of ineligible students, less motivated students and those attending summer schools elsewhere, and we cannot determine this in the data. In light of these considerations, we believe that our findings are unlikely to be upward biased.

Even when comparator and participant groups appear comparable, motivational and academic differences may persist, leading to overestimation of impact if only attitudinal outcomes are measured. Where aspirations are already high, reviewing where they apply and attend can support how effective summer school programme can be.

Correlation between summer school attendance, student characteristics and application rates

In this research, all the students – the participants and the non-participants – applied for a University of Bath summer school, and therefore the sample contains those who have observed and unobserved characteristics that lead them to want to investigate potential HE options by attending a summer school. As such, they may not be representative of the year 12 student body more generally given they may differ systematically from those who do not apply in characteristics that independently predict HE progression, irrespective of programme involvement (Hatt et al., 2009; TASO, 2023). There is uncertainty over whether programmes causally affect the observed outcomes or merely attract students predisposed to positive outcomes. However, our quasi-experimental set-up in which all the students in the data have at least applied to the Bath summer school allows us to account to some extent for this positive selection of students.

Within the sector, summer schools may support recruitment activity more than widening access, by redistributing opportunities among students who may have progressed regardless of interventions. Participation typically requires self-nomination, selecting suitable students to attend based on set criteria, and at times reviewing oversubscribed programmes and selecting based on academic merit, or compelling personal statements which further filter participants.

Our analysis shows that summer schools provided by the University of Bath have a positive impact on progression to HE, progression to a high-tariff provider, and progression to Bath itself. Moreover, in the latter cases, it does not look as though it is merely redistributing opportunity amongst those who would progress to higher-tariff institutions in any case, the evidence suggests that POLAR 1 and POLAR 2 students are the greatest beneficiaries of summer school participation. As such, the Bath summer schools are widening participation, not just increasing recruitment of already HE bound students.

Conclusion

To date, evidence on the effectiveness of summer schools has focused primarily on the impacts on potential students' awareness of HE, their attitudes and their aspirations. There is little analysis of medium-term outcomes, such as HE enrolment and progression to high-tariff institutions. There is also limited existing work examining differential impacts for different groups of students – particularly WP students – and robust plausibly causal estimates are also lacking.

In this project, we address these gaps by examining the effects of participation in a University of Bath summer school on HE enrolment, progression to a high-tariff institution and progression to the University of Bath in particular. All students in the data applied to attend a Bath summer school, removing one element of selection bias, and our combination of propensity score matching and regression modelling provides quasi-experimental estimates of the impact of participating in a Bath summer school on these tangible HE outcomes. Our subgroup analysis allows us to investigate the extent to which WP groups benefit in particular.

Our findings suggest that participating in a University of Bath summer school does indeed increase the likelihood of enrolling in HE, compared to students with similar characteristics who applied but did not attend the Bath summer school. Participation also increases the likelihood of attending a high-tariff institution, and this is particularly the case for students from low participation neighbourhoods (POLAR 1 and 2). Finally, summer school participation also increases the likelihood of a student attending the University of Bath in particular, almost doubling the chances. Again, it is students from low participation neighbourhoods who benefit the most from this, with it also being notable that the summer school has more of a positive effect on males compared to females, and the benefit is exclusively for white students. The

estimates are largely robust and given the quasi-experimental nature of the approach, they are unlikely to be upwardly biased to any significant degree.

The implications of this analysis are three-fold. Firstly, year 12 residential summer schools at the University of Bath do increase the likelihood of progression to HE by a non-trivial amount, even amongst a group of students who already have a high probability of going to HE, though with no particularly different impact for WP students. Secondly, there is evidence that summer school participation does increase the likelihood of attending a high-tariff institution, and that in particular it increases the probability for students from low participation neighbourhoods. The effects are large enough to erase their deficit in probability compared students from the highest participation neighbourhoods and indeed give them an advantage in terms of likelihood of progression to a high-tariff provider. This suggests that the summer schools do an important job for students from low participation areas – whether that is making students aware of the different types of provider, raising their aspirations and/or providing application support – and this translates into a tangible increase in their likelihood of enrolling at a high-tariff institution. Similarly, participation in a University of Bath summer school massively increases the likelihood of students progressing to the University of Bath, and this increase is particularly evident for students from low participation areas. Given the greater likelihood of females attending HE than males overall, it is notable that the effect on attending Bath is particularly important for male students. That there is not a summer school effect for students from ethnic groups other than white is disappointing from a WP perspective, especially given non-white students make up 43% of Bath summer school participants, but provides clear guidance for where future research needs to be directed, in order to understand why the benefits of summer school participation are not translating equally across all ethnic groups.

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Appendices

Appendix A: Access and Participation Plan and Risks to Equality of Opportunity

The University of Bath's Access and Participation Plan⁹ identifies nine risks to equality of opportunity (Figure 1). Equality of opportunity means "individuals are not hampered in accessing and succeeding in higher education as a result of their background or circumstances they cannot fairly influence" (The Office for Students, 2025).

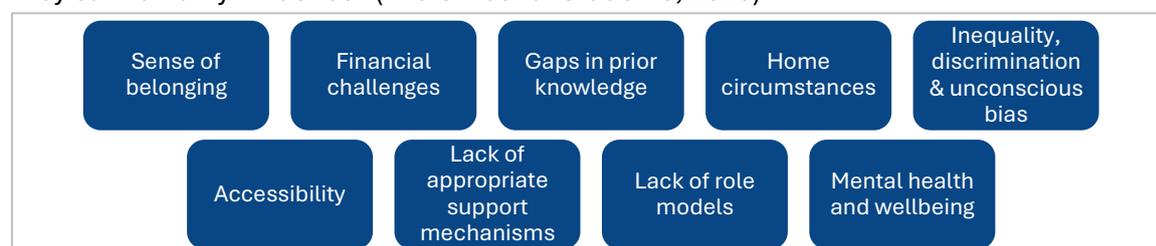


Figure 1: University of Bath's nine key risks to equality of opportunity across the student lifecycle.

The associated risks that the evaluation/programme are designed to address are:

- sense of belonging
- gaps in prior knowledge
- home circumstances
- lack of appropriate support mechanisms
- lack of role models

Appendix B: Descriptive statistics of dataset

	Summer School Participants		PS Matched comparison group*	
	mean	s. d	mean	s. d
year of summer school (2015/16=1, ..., 2018/19=4)	2.8	1.0	2.5	0.9
female	0.623	0.485	0.663	0.473
unknown sex	0.000	0.000	0.000	0.000
disability yes	0.062	0.241	0.008	0.087
disability unknown	0.031	0.173	0.104	0.305
White	0.569	0.496	0.567	0.496
Asian	0.225	0.418	0.185	0.389
Black	0.098	0.298	0.094	0.292

⁹ University of Bath Access and Participation Plan available from <https://www.bath.ac.uk/publications/access-and-participation-plan-2024-to-2028-and-fee-information/>

Mixed ethnicity	0.055	0.229	0.035	0.185
Other ethnicity	0.018	0.135	0.010	0.100
Unknown ethnicity	0.032	0.177	0.109	0.312
Polar4 Q1	0.158	0.365	0.127	0.333
Polar4 Q2	0.226	0.419	0.167	0.374
Polar4 Q3	0.182	0.386	0.233	0.423
Polar4 Q4	0.237	0.426	0.235	0.425
Polar4 Q5	0.157	0.364	0.190	0.393
Polar4 missing	0.040	0.196	0.048	0.214
IMD Q1	0.200	0.400	0.167	0.374
IMD Q2	0.242	0.428	0.197	0.399
IMD Q3	0.198	0.399	0.185	0.389
IMD Q4	0.177	0.382	0.192	0.395
IMD Q5	0.143	0.350	0.210	0.408
IMDQ missing	0.040	0.196	0.048	0.214
IDACI Q1	0.192	0.394	0.134	0.341
IDACI Q2	0.223	0.417	0.197	0.399
IDACI Q3	0.202	0.401	0.185	0.389
IDACI Q4	0.138	0.346	0.170	0.376
IDACI Q5	0.126	0.332	0.180	0.384
IDACI Q missing	0.118	0.323	0.134	0.341
SOC Higher managerial & professional	0.171	0.377	0.213	0.410
SOC lower managerial/professional	0.198	0.399	0.241	0.428
SOC small employers/own account	0.097	0.296	0.084	0.277
SOC intermediate occupations	0.123	0.329	0.127	0.333
SOC lower supervisory & tech. occ.	0.063	0.243	0.046	0.209
SOC semi routine occ.	0.120	0.325	0.116	0.321
SOC routine occ.	0.094	0.292	0.073	0.261
SOC missing	0.134	0.341	0.101	0.302
Young Carer no	0.466	0.499	0.296	0.457
Young Carer yes	0.026	0.160	0.000	0.000
Young Carer unknown	0.508	0.500	0.704	0.457
UCAS points	139.9	36.1	132.5	41.3
N	650		395	

*Comparison group is made up of those that applied to attend a summer school but were either not selected or chose not to participate.

Appendix C: Regression coefficients from model

Dependent variable: Attend Higher Education

	Coeff.	Std. Err.	t	p-value
participant	0.0627	0.0166	3.77	0.000
year of summer school	-0.0066	0.0095	-0.70	0.487
female	-0.0191	0.0158	-1.21	0.228
unknown sex	0.4137	0.0336	12.32	0.000

disability yes	0.0032	0.0368	0.09	0.931
disability unknown	0.2110	0.1176	1.79	0.073
Asian	0.0181	0.0200	0.91	0.365
Black	0.0335	0.0262	1.28	0.202
Mixed ethnicity	-0.0405	0.0321	-1.26	0.206
Other ethnicity	0.0469	0.0574	0.82	0.414
Unknown ethnicity	-0.0834	0.1158	-0.72	0.472
Polar4 Q2	0.0328	0.0256	1.28	0.201
Polar4 Q3	0.0246	0.0268	0.92	0.359
Polar4 Q4	0.0329	0.0255	1.29	0.197
Polar4 Q5	0.0238	0.0294	0.81	0.418
Polar4 missing	0.0124	0.0528	0.23	0.814
IMD Q2	-0.0076	0.0270	-0.28	0.778
IMD Q3	-0.0076	0.0322	-0.24	0.814
IMD Q4	0.0201	0.0368	0.55	0.586
IMD Q5	0.0399	0.0415	0.96	0.336
IDACI Q2	0.0466	0.0274	1.70	0.089
IDACI Q3	-0.0079	0.0344	-0.23	0.817
IDACI Q4	-0.0235	0.0383	-0.61	0.540
IDACI Q5	0.0103	0.0420	0.25	0.806
IDACI Q missing	0.0226	0.0378	0.60	0.549
SOC lower managerial/professional	0.0056	0.0069	0.81	0.419
SOC small employers/own account	-0.0008	0.0102	-0.08	0.935
SOC intermediate occupations	0.0065	0.0098	0.66	0.508
SOC lower supervisory & tech. occ.	-0.0034	0.0101	-0.34	0.735
SOC semi routine occ.	0.0033	0.0106	0.31	0.755
SOC routine occ.	0.0069	0.0111	0.62	0.533
SOC missing	-0.4345	0.0250	-17.42	0.000
Young Carer yes	0.1042	0.0702	1.48	0.138
Young Carer unknown	0.0227	0.0182	1.25	0.211
Constant	0.9225	0.0362	25.52	0.000
N		1449		
R2		0.3523		

Dependent variable: Attend high-tariff institution

	Coeff.	Std. Err.	t	p-value
participant	0.0401	0.0297	1.35	0.177
year of summer school	0.0401	0.0169	2.37	0.018
female	-0.0158	0.0268	-0.59	0.555
disability yes	0.0568	0.0626	0.91	0.365
disability unknown	0.1081	0.1709	0.63	0.527

Asian	0.0208	0.0341	0.61	0.542
Black	-0.0240	0.0463	-0.52	0.605
Mixed ethnicity	0.0704	0.0547	1.29	0.198
Other ethnicity	-0.0947	0.0851	-1.11	0.266
Unknown ethnicity	-0.0575	0.1674	-0.34	0.731
Polar4 Q2	0.0647	0.0450	1.44	0.151
Polar4 Q3	0.0956	0.0452	2.11	0.035
Polar4 Q4	0.0921	0.0434	2.12	0.034
Polar4 Q5	0.1389	0.0473	2.94	0.003
IMD Q2	0.0103	0.0501	0.20	0.838
IMD Q3	0.0662	0.0617	1.07	0.283
IMD Q4	0.0752	0.0657	1.14	0.253
IMD Q5	-0.0116	0.0727	-0.16	0.873
IMD Q missing	0.2294	0.0957	2.40	0.017
IDACI Q2	-0.0562	0.0518	-1.08	0.279
IDACI Q3	-0.0912	0.0600	-1.52	0.129
IDACI Q4	-0.0451	0.0664	-0.68	0.497
IDACI Q5	-0.0351	0.0709	-0.50	0.621
IDACI Q missing	-0.2036	0.0676	-3.01	0.003
SOC lower managerial/professional	0.0231	0.0373	0.62	0.536
SOC small employers/own account	0.0094	0.0486	0.19	0.847
SOC intermediate occupations	0.0059	0.0454	0.13	0.896
SOC lower supervisory & tech. occ.	-0.0056	0.0640	-0.09	0.930
SOC semi routine occ.	0.0267	0.0475	0.56	0.574
SOC routine occ.	-0.0218	0.0555	-0.39	0.695
SOC missing	0.0058	0.0491	0.12	0.906
Young Carer yes	-0.1167	0.1087	-1.07	0.283
Young Carer unknown	-0.0211	0.0318	-0.66	0.508
UCAS points (top 4 A-levels)	0.0067	0.0003	20.87	0.000
Constant	-0.4524	0.0786	-5.76	0.000
N		1045		
R2		0.3544		

Dependent variable: Attend the University of Bath

	Coeff.	Std. Err.	t	p-value
participant	0.0425	0.0171	2.48	0.013
year of summer school	0.0041	0.0105	0.39	0.697
female	-0.0086	0.0189	-0.46	0.647
disability yes	-0.0635	0.0362	-1.75	0.080
disability unknown	0.0261	0.0649	0.40	0.688
Asian	-0.0255	0.0235	-1.09	0.278

Black	-0.0654	0.0216	-3.04	0.002
Mixed ethnicity	-0.0737	0.0335	-2.20	0.028
Other ethnicity	-0.0927	0.0228	-4.07	0.000
Unknown ethnicity	-0.0710	0.0567	-1.25	0.210
Polar4 Q2	0.0216	0.0256	0.84	0.399
Polar4 Q3	0.0205	0.0263	0.78	0.438
Polar4 Q4	0.0320	0.0252	1.27	0.205
Polar4 Q5	0.0678	0.0320	2.12	0.034
IMD Q2	-0.0459	0.0269	-1.71	0.088
IMD Q3	-0.0399	0.0381	-1.05	0.296
IMD Q4	-0.0208	0.0413	-0.50	0.614
IMD Q5	-0.0363	0.0455	-0.80	0.425
IMD Q missing	-0.0137	0.0549	-0.25	0.803
IDACI Q2	0.0346	0.0265	1.31	0.191
IDACI Q3	0.0565	0.0360	1.57	0.117
IDACI Q4	0.0126	0.0391	0.32	0.747
IDACI Q5	0.0653	0.0498	1.31	0.191
IDACI Q missing	0.0442	0.0401	1.10	0.271
SOC lower managerial/professional	-0.0017	0.0300	-0.06	0.955
SOC small employers/own account	-0.0758	0.0298	-2.55	0.011
SOC intermediate occupations	0.0042	0.0347	0.12	0.904
SOC lower supervisory & tech. occ.	0.0353	0.0497	0.71	0.478
SOC semi routine occ.	-0.0434	0.0299	-1.45	0.147
SOC routine occ.	-0.0404	0.0329	-1.23	0.220
SOC missing	-0.0321	0.0315	-1.02	0.307
Young Carer yes	0.0076	0.0619	0.12	0.902
Young Carer unknown	0.0244	0.0189	1.29	0.197
UCAS points (top 4 A-levels)	0.0006	0.0002	3.26	0.001
Constant	-0.0443	0.0456	-0.97	0.331
N			1045	
R2			0.0568	

Robustness of findings to full versus PSM sample

		Main sample (PS matched)				Full sample			
		Coeff.	Std. Err.	t	p-value	Coeff.	Std. Err.	t	p-value
Attend HE	participant	0.0627	0.0166	3.77	0.000	0.0603	0.0159	3.80	0.000
	N		1449				1803		
	R2		0.3523				0.3305		

Attend high-tariff	participant	0.0401	0.0297	1.35	0.177	0.0472	0.0292	1.62	0.106
	N		1045				1175		
	R2		0.3544				0.357		

Attend Bath	participant	0.0425	0.0171	2.48	0.013	0.0399	0.0169	2.36	0.018
	N		1045				1045		
	R2		0.0568				0.0559		

Access and Participation Evaluation



UNIVERSITY OF
BATH

APP Impact Team
Student Recruitment and Admissions
University of Bath
Claverton Down
Bath
BA2 7AY

Email: appimpact@bath.ac.uk