ORIGINAL ARTICLE

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Do participants in widening participation outreach programmes in England progress to selective universities at a higher rate than would otherwise be expected?

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Abstract

Young people growing up in England from a poorer background are less likely to progress into higher education compared to their better off counterparts. This is especially true with respect to more selective universities. This study used government administrative data to gauge the effectiveness of the 'Realising Opportunities' programme, which provides a package of support to prospective university applicants from disadvantaged backgrounds to facilitate their progression to more selective universities. Data was gathered concerning 769 16 to 18-year-old students who took part in the programme—which is delivered by a consortium of selective universities—between 2015 and 2017. This data revealed participants' personal characteristics (e.g., gender, ethnicity and socioeconomic status), school attainment and eventual university destination (or lack thereof). Additionally, national administrative data was sourced from the Department for Education's National Pupil Database and the Higher Education Statistics Agency for the entire cohort of state school pupils in England who turned 16 in the 2014–2015 academic year. This national data was used to generate a statistical model that could predict the likelihood of a young person in England progressing to a selective university based on their school attainment and other personal characteristics. Data concerning the programme participants was fed through the model and it was

observed that the number of participants who had in fact progressed to selective universities greatly exceeded that predicted. Participation in the Realising Opportunities programme therefore appeared to be positively associated with an increased likelihood of progression to a selective university.

KEYWORDS

higher education, outreach, widening participation

Key insights

What are the main issues that the paper addresses?

This paper considers the extent to which taking part in a widening participation outreach programme is positively associated with an increased likelihood of progression to a selective university in England.

What are the main insights that the paper provides?

Participation in the outreach programme was positively associated with an increased likelihood of progression to a selective university. One determinant of the success of the programme was the fact that most participants appeared not to be on a pathway to a selective university prior to their participation in the intervention.

INTRODUCTION

It has long been established that young people in England growing up in poorer households are less likely to take part in higher education (HE) compared to those growing up in better off households (Crawford et al., 2016; Smith, 2018). Furthermore, disparities in access to HE by socioeconomic background appear to be most acute at more selective universities, which require entrants to have high levels of prior attainment (Bolton & Lewis, 2023; Department for Education, 2023).

On average, university graduates enjoy higher salaries than their non-graduate counterparts (Boero et al., 2019; Britton et al., 2016; Naylor et al., 2015), with graduates from more selective universities also tending to earn more on average than those who have attended less selective universities (Belfield et al., 2018; Walker & Zhu, 2017). HE participation also appears to be positively associated with a number of favourable non-financial outcomes in later adulthood, such as longer life expectancy, greater civic engagement and a lower likelihood of committing crime (Brennan et al., 2013). This creates social justice implications, whereby young people from poorer backgrounds are more likely to be deprived of the benefits of HE. Similarly, anything which in fact enables more young people from disadvantaged backgrounds to participate in HE has the potential to facilitate greater intergenerational social mobility.

In recent decades there has been a drive to 'widen participation' in HE through various initiatives and policy interventions that have aimed to increase the number of people from disadvantaged backgrounds progressing to HE. Such initiatives have included the provision of financial support to students (Corver, 2010; Dearden et al., 2014), the use of 'contextual admissions' policies, where disadvantaged students may be admitted to universities with lower prior attainment than would otherwise be required (Boliver et al., 2017; Gorard et al., 2019), and the drive to narrow socioeconomic attainment gaps in primary and secondary schooling, for example through the deployment of 'pupil premium' funding (Department for Education, 2010).

This paper, however, concerns another category of intervention intended to widen participation in HE, which is the provision of outreach programmes. 'Outreach' can be defined as 'any activity that reaches out beyond higher education providers to engage with wider communities in order to raise HE awareness and aspirations' (Moore et al., 2013: iii). This paper focuses in particular on the 'Realising Opportunities' (RO) outreach programme, which is delivered by a consortium of selective universities. The programme targets high-attaining young people from disadvantaged backgrounds and provides them with a package of support including mentoring, study skills support and campus visits with a view to supporting participants to progress to selective universities after completion of the programme (Williams & Mellors-Bourne, 2019).

As will be revealed later in this paper, cohorts of participants in the RO programme do not tend to be representative of the wider population of young people in England. This means that gauging the success of the programme in facilitating progression to selective universities is not entirely straightforward, since any difference in progression rates to selective universities between RO participants and the young population as a whole could easily be explained by various confounding variables and not the programme itself. To work around this problem, this study uses a novel method that leverages an entire cohort of administrative data concerning young people in England to understand the extent to which RO participants are more likely to progress to selective universities, even when their non-representative nature is taken into consideration. The method used also illustrates how it is possible to make effective use of government administrative data, even when it is not possible to directly link it with data concerning the recipients of a particular intervention.

LITERATURE REVIEW

Education and social mobility

Any successful effort to widen participation in HE has the potential to support upward social mobility (i.e., the tendency to end up in a higher social class than one's parents), though overall patterns of social mobility during the twentieth and early twenty-first century remain somewhat unclear. Whilst studies of the early twentieth century have suggested that most people tended to remain in the same social class into which they were born (Glass, 1954), the middle decades of the twentieth century have been described as a 'golden age' of social mobility, primarily due to the increasing availability of professional and managerial employment (Goldthorpe, 2016).

In the early twenty-first century, a report commissioned by Tony Blair's Labour government concluded that levels of social mobility were broadly flat during the period from 1970 to 2000, but that higher levels of social mobility were likely to be on the horizon due to the reductions in levels of educational inequalities that were being observed (Cabinet Office, 2008). However, by 2017, the then Education Secretary Justine Greening did not appear to be of

the view that levels of social mobility were high, and claimed that Britain was facing a 'social mobility emergency' (Greening, 2017).

Educational interventions have the potential to support greater social mobility by disrupting the transmission of both advantage and disadvantage from one generation to the next. Such transmission can be understood in both an economic and a sociological sense. Wealthier parents are able to use their financial capital to support their children to succeed in the education system, for example they may pay for private tutoring or be more likely to be able to afford to reside in the catchment areas of higher-quality schools (Gorard, 2016; Ireson & Rushforth, 2011). Additionally, wealthier parents may also possess greater levels of non-financial cultural and social capital, which may help to support their children in achieving higher levels of educational qualifications (Bukodi & Goldthorpe, 2012). Within the framework of human capital theory, young people who develop their skills and knowledge through education are perceived to be more valuable to employers and as such are able to command higher salaries in the labour market (Becker, 1964; Schultz, 1959). Supporting young people from disadvantaged backgrounds to achieve higher levels of educational qualifications through HE participation is therefore one possible mechanism that might disrupt some of the usual patterns of transmission of different forms of capital across generations.

Widening participation in higher education

Concerns about disparities in access to HE by social class background would appear to date back to at least the nineteenth century (Kettley, 2007), though the issue fell into sharper focus in the twentieth century following the publication of the 'Robbins Report' in 1963, which asserted that HE 'should be available for all those who are qualified by ability and attainment' (Committee on Higher Education, 1963: 8). Whilst the Robbins Report advocated for an expansion of HE provision, declining birthrates from the 1960s onwards could, in fact, have resulted in a shrinking of the HE sector (Armitage, 1978). However, by the late 1970s, a government discussion paper on the future of HE acknowledged that one possible way the number of HE students in England could be kept at least stable might be through 'taking positive steps as a matter of social policy to encourage participation by children of manual workers to approach more closely the level of participation by children of non-manual workers' (Department of Education and Science, 1978a: 9). In practice, HE access efforts during this period were focused on enabling more mature students to enter HE to support with recruitment to certain professions (e.g., teaching and social work), given the anticipated future shortfall of younger HE students (Department of Education and Science, 1978b).

By the mid-1990s, the term 'widening participation' was starting to enter general parlance (see, e.g., Sanders, 1994; Uden, 1996) and around the same time a report published by the influential 'Dearing Committee' found that inequalities in rates of HE access by family background still very much existed (NCIHE, 1997). The significant growth of the HE sector during this period was accompanied by an ongoing concern as to whether certain groups might be benefiting disproportionately from this expansion (Meikle & Major, 1997). By 1998, university tuition fees of £1000 per year had been introduced in England for the first time, though young people from poorer families were made exempt from payment (Crawford et al., 2016).

In 2003, a government white paper set out plans for the continued expansion of the UK HE sector in order to both drive economic prosperity and support social justice by ensuring that 'all those who have the potential to benefit from higher education should have the opportunity to do so' (Department for Education and Skills, 2003: 68). Nine years later, the maximum permitted cost of undergraduate degrees in England had hit an all-time high (at the time) of £9000 per year, though universities were only allowed to charge more than £6000 per year if they committed to spending some of their revenue

on initiatives to support more disadvantaged students to attend (BIS, 2011). By 2018, the recently formed Office for Students (the HE regulator for England) set out a new vision for what they called 'access and participation', involving more ambitious targets for the sector (with respect to widening access), increased accountability for universities and an evidence-led approach with respect to the delivery of interventions intended to support disadvantaged or under-represented groups (Office for Students, 2018b). HE providers were now required to produce 'Access and Participation Plans', which described the steps they were taking to support equality of opportunity (Office for Students, 2019b). Providers were also encouraged to explain how they would contribute to the sector as a whole meeting certain 'Key Performance Indicators' specified by the Office for Students, one of which was a target to eliminate entirely the gap in entry rates at 'higher-tariff providers' between the most and least represented groups by the 2038–2039 academic year (Office for Students, 2019a).

The link between household income and progression to selective universities

The UK government's Department for Education (DfE) releases annual statistics concerning the progression rates of entire cohorts of English state school pupils to higher education (Department for Education, 2023). These statistics are broken down by various personal characteristics such as gender and ethnicity, and there is also a breakdown by destination such that the proportion of pupils progressing to 'high-tariff' universities can be observed alongside proportions progressing to HE in general. The DfE groups all HE providers into the three categories of 'high tariff', 'medium tariff' and 'low tariff' by calculating a mean entry tariff of examination grades achieved by UK-domiciled entrants aged under 21 to these universities before assigning one-third of providers into each category (Department for Education, 2021). In this paper, the terms 'selective' and 'high tariff' should be read as being synonymous.

A link between household income and the likelihood of progression to selective universities is revealed when one examines the DfE's statistics concerning pupils who are in receipt of free school meals (FSM). Pupils qualify for FSM when members of their household meet particular criteria, such as being in receipt of certain means-tested benefits (HM Government, 2012). These pupils can therefore be presumed to live in households with a lower income, and recent research has confirmed that FSM status correlates well with other measures of socioeconomic status (Ilie et al., 2017). Table 1 summarises recent trends in access to high-tariff HE, broken down by FSM status.

These figures concern progression to university by age 19. The academic year in each row refers to the year that the cohort turns 16 (and completes the last year of compulsory secondary schooling). For example, the cohort that turned 16 during 2017/2018 would be observed beginning HE study in either the 2020/2021 year at age 18 or the 2021/2022 year at age 19. For every cohort, non-FSM pupils are considerably more likely to progress to high-tariff HE than FSM pupils. Over time, rates of participation have increased for both non-FSM and FSM pupils, though the percentage point gap between the two progression rates has not narrowed and in fact has widened for the most recent cohort.

What might explain the persistently lower progression rate of FSM students to selective universities? Previous research has suggested that the lower HE participation rate of FSM pupils can largely be attributed to their lower average school attainment (Crawford & Greaves, 2015; Croll & Attwood, 2013), though some research points to other potential contributing factors, such as worries about the cost of university (Callender & Jackson, 2004). Some researchers also suggest that young people from a working-class background may

TABLE 1 Progression to high-tariff universities in England by age 19 by FSM status (2012–2018).

Academic year (during which pupils turn 16)	Total size of cohort	Number of non-FSM pupils progressing to high-tariff HE	Number of FSM pupils progressing to high-tariff HE	Percentage of non-FSM pupils progressing to high-tariff HE	Percentage of FSM pupils progressing to high-tariff HE	Percentage point difference between non-FSM and FSM progression
2017/2018	523,990	66,912	3564	14.6	5.3	9.3
2016/2017	529,802	57,212	3128	12.4	4.5	7.9
2015/2016	541,022	56,167	2869	12.0	4.0	8.0
2014/2015	554,758	57,373	3136	12.0	4.1	7.9
2013/2014	559,960	53,767	2760	11.2	3.4	7.8
2012/2013	572,942	53,134	2653	10.9	3.1	7.8

Abbreviations: FSM, free school meals; HE, higher education.

Source: Department for Education (2023).

feel more psychologically constrained in the HE decision-making process and may disregard more prestigious universities due to worries about not fitting in (Ball et al., 2002; Reay, 1998).

Students from less advantaged backgrounds might also find themselves disadvantaged in the application process for a more selective university. For example, Jones (2013) observes that, compared to applicants from independent schools, university applicants from state-funded schools and colleges may find that they have fewer experiences to draw upon when completing 'personal statements', which are used by selective universities in making admissions decisions. Similarly, Boliver (2013) examined application data to prestigious universities from 1996 to 2006 and found that applicants from a lower social class background were less likely to receive an offer of admission compared to equivalently qualified peers from a wealthier background.

It should be noted, however, that parental household income is certainly not the only personal characteristic that appears to have a bearing on the likelihood of young people progressing to high-tariff HE, with disparities in access also being observed in relation to gender, ethnicity and neighbourhood of residence (Crawford & Greaves, 2015; Department for Education, 2023; Montacute & Cullinane, 2023; Richardson et al., 2020).

Outreach programmes

Widening participation outreach programmes may have the potential to reduce socioeconomic disparities in access to selective universities. Robinson and Salvestrini (2020) provide a categorisation of five different types of outreach intervention that might be offered to disadvantaged or under-represented students:

1. 'Mentoring, counselling and role models' interventions typically involve interaction between current HE students and prospective ones.
2. 'Information, advice and guidance' interventions help to supply students with relevant information so that they may make informed decisions about their future.
3. 'Summer school' interventions are typically residential experiences where students live on campus for a short period of time to get a taste of university life.
4. 'Black box interventions' are multi-faceted interventions that may involve a combination of approaches already mentioned.
5. Any other interventions, such as campus visits and subject taster sessions.

Some outreach programmes are delivered through government-funded initiatives such as the National Collaborative Outreach Programme (later rebranded as 'Uni Connect') (Office for Students, 2018a), while others are delivered by charitable third-sector organisations (IntoUniversity, 2017; The Brilliant Club, 2018). Some programmes are run by individual universities, such as the University of Oxford's summer schools programme (University of Oxford, 2017), while others are run collaboratively by a number of universities working together, such as the Realising Opportunities programme that is the focus of this paper (Williams & Mellors-Bourne, 2019).

A number of different literature reviews have been conducted so far on the effectiveness of widening participation outreach programmes, including Gorard et al. (2006), Moore et al. (2013) and Robinson and Salvestrini (2020). These three reviews have two themes in common. Firstly, there is agreement that, broadly speaking, the literature shows signs of promise that outreach interventions may be effective. For example, Moore et al. (2013) find that 'there are instances where the balance of evidence points to a strong possibility of significant impact' (p. ix), while Robinson and Salvestrini (2020) observe that 'most of the

studies analysed found positive but modest effects' (p. 5). Secondly, there is agreement that a lack of rigour in programme evaluation so far has meant that it is not necessarily clear that outreach programmes are having a *causal* impact on their participants, since any positive outcomes could be attributed to the self-selecting and unrepresentative nature of those participating. Robinson and Salvestrini (2020), for example, reported that only 23 out of the 92 studies they reviewed had used a method that could judge whether an effect was causal.

Crawford et al. (2017) propose that evaluations of outreach programmes are classified on a scale of three different 'levels' of rigour. To reach 'Level 1', an outreach provider must provide a narrative as to why a particular outreach strategy has been selected, whereas to get to 'Level 2', an evaluation must involve the collection and analysis of data concerning measurable outcomes of outreach participants. To achieve 'Level 3', evaluators must use a method that can demonstrate that their outreach programme has a causal effect on participants. This may involve an experimental method such as a randomised controlled trial (RCT).

A large number of evaluations of outreach programmes found in the literature sit at 'Level 2' in this hierarchy, since they involve the collection and analysis of data concerning programme participants. For example, Hatt et al. (2009) collected data concerning participants in a summer school programme and found that taking part in the programme helped young people to feel more confident about 'fitting in' socially and academically at university. Similarly, an analysis of the national Aimhigher summer school programme found that participants from the programme's target group were more than twice as likely to apply to and be accepted into HE when compared to those from similar backgrounds who did not participate (HEFCE, 2010).

A small number of studies in the literature reach the 'Level 3' standard of evaluation through the use of an appropriately selected comparator group. For example, Sanders et al. (2018) used an RCT method to gauge the effectiveness of a programme where current undergraduate students delivered inspirational talks in secondary schools about the benefits of HE. The outcomes for participating students were compared against outcomes for a control group of non-participants who were also attending a school that had expressed an interest in taking part. The researchers concluded that the intervention had a small but modest impact on school-level application rates to high-tariff universities.

A second 'Level 3' evaluation can be found in TASO (2022), which presents the initial findings of an RCT used to evaluate online summer schools provided by a number of different universities in 2021, during the COVID-19 pandemic. As part of this analysis, participants were asked to complete surveys both prior to and after the summer school intervention, with one question in the survey asking participants to specify how likely they felt it was that they would apply to university. Even prior to the intervention, 94% of participants indicated that they were either 'likely' or 'extremely likely' to apply to HE (TASO, 2022), leading the evaluators to remark that 'summer schools designed to reduce equality gaps in access to higher education are largely attended by students already destined for university' (TASO, 2022). The overall effectiveness of a given outreach programme is likely to be a function not just of the quality and appropriateness of the programme's activities and content, but also of the appropriateness of the cohort of participating students recruited to take part. If participating students in fact have a high likelihood of HE progression prior to the intervention, there is a risk that resources are being allocated 'to change the behaviour of an individual who is likely to display the desired behaviour anyway' (TASO, 2022: 27).

The Realising Opportunities programme

RO is a widening participation outreach programme delivered by a consortium of different universities, which aims to support young people from disadvantaged backgrounds to progress

to selective universities. RO draws on a tradition of partnership in widening participation outreach provision, given that it involves a partnership formed between multiple universities. This can be contrasted with outreach partnerships formed solely between individual universities and individual schools or colleges, such as those observed by Murphy (2002). The partnership is led by a central administrative team based at Newcastle University. This section describes the programme as it was constituted between 2015 and 2017, the timeframe for the analysis presented in this paper. The RO website describes the programme as follows:

> RO is a unique collaboration of leading research intensive universities working together to promote fair access to university and professions. We support some of the country's brightest 16–19 year olds through a structured programme of interventions designed to ensure they can be successful in their education and future career. (Realising Opportunities, n.d.)

RO can be described as a 'black box' intervention, as defined above by Robinson and Salvestrini (2020), since it involves the provision of a package of different interventions. Whilst each intervention is not likely to be unique to RO, the programme offers participants the convenience of being able to access multiple different services and opportunities through a single channel. Students take part in the programme for 2 years between the ages of 16 and 18. To be offered a place on the programme, participants must submit an online application to take part. This application has to be submitted relatively early during a student's A-level (or equivalent) studies, typically during the autumn term of the first year of A-level study. Whilst some students may be encouraged to apply by their teachers, individual students must nonetheless take the initiative to choose to apply and be organised enough to submit their application ahead of the deadline.

Once enrolled on the programme, participants take part in a launch event on a university campus, complete an online study skills programme, engage in 'e-mentoring' with a current undergraduate student, attend a national student conference and complete an academic assignment. Students who complete the programme and go on to apply to a participating university receive a lower 'alternative offer' for entry, which is typically two A-level grades (or equivalent) lower than the standard offer. In order to be eligible to apply to take part in the programme, students must be attending an underperforming state-funded school and are required to have achieved high examination grades at age 16 in their GCSE or equivalent assessments. Applicants must also meet at least two disadvantage criteria, such as being in receipt of FSM, living in a socioeconomically deprived area or living in local authority care. Williams and Mellors-Bourne (2019) provide full details of programme eligibility criteria and a list of participating universities. They also present their own evaluation of the RO programme, which concludes that the programme is well targeted and helps participants to increase their knowledge of high-tariff universities. RO participants were found to be more likely to attend high-tariff universities compared to a comparator group, were less likely to drop out of university once they started and also more likely to undertake further study after graduation (Williams & Mellors-Bourne, 2019). The evaluation of RO presented in this paper complements this existing evaluation and also triangulates some of its findings.

METHODS

Data gathering

Data concerning participants in the RO programme was supplied directly by the programme's administrative staff and was provided in anonymised form. The data concerned

a single cohort of participants who took part in the programme between 2015 and 2017. The dataset supplied revealed each participant's gender, ethnicity and FSM status. It also revealed characteristics of the participant's neighbourhood; that is, the 'POLAR' and IMD metrics for these neighbourhoods (further details of these metrics are provided later). There were also details of the Key Stage 4 qualifications obtained by each participant, including subjects studied and grades achieved. Finally, there was a field showing the HE destination (if any) of each participant. The original source of this data (bar the HE destinations data) was an application form completed by participants prior to taking part in the programme. The HE destinations data was sourced by RO staff using data supplied by the Higher Education Statistics Agency (HESA). In total, data concerning 815 participants was supplied. However, some data was missing for 34 of these participants and a further 12 participants had not consented to have their HE destination tracked. These cases were discarded, leaving 769 cases remaining.

In addition to the data concerning RO participants, data was also sourced concerning the entire cohort of English school pupils who turned 16 during the 2014–2015 academic year (of which the RO students were a subset). The national cohort data was obtained from the DfE's National Pupil Database (NPD) and was accessed through the Office for National Statistics (ONS) Secure Research Service. In particular, the Key Stage 4 dataset within the NPD was used. This contained full details of pupils' attainment at age 16, as well as details of certain characteristics of pupils such as their gender, ethnicity and FSM status. Pupils' home postcodes were also available, and these could be used to infer details of the neighbourhoods in which pupils resided. Records concerning 622,519 pupils were accessed in total.

Additionally, data was accessed concerning all undergraduate students registered at UK HE institutions during the 2017–2018 ($n = 1,556,322$) and 2018–2019 ($n = 1,598,574$) academic years. This data was provided by HESA and also accessed through the ONS Secure Research Service. These datasets revealed which particular HE institution students were attending.

Pseudonymous matching references included in both the NDP and HESA datasets meant that it was possible to link these two datasets together. However, it should be noted that it was not possible to match the data concerning the RO participants to the NPD and HESA data, given the lack of any suitable identifiers or matching references that could be used for this purpose. Had such matching been possible, participation in RO could have been used as an independent variable in a regression analysis to gauge its influence on the likelihood of progression to a selective university once other covariates had been controlled for. The inability to match these datasets together is therefore what necessitated the statistical modelling approach, described below.

Data processing and analysis

Several initial steps were taken to prepare the NPD dataset for analysis. Firstly, all pupils who were not aged 15 at the start of the 2014–2015 academic year ($n = 11,506$) were removed from the dataset. Independent school pupils ($n = 48,656$) were also removed. Whilst independent school pupils are present in the NPD, details of the personal characteristics of these students are not typically available, meaning that these pupils were not suitable for use in this analysis. There were a small number of duplicate cases in the data ($n = 519$), and one of each duplicate was removed. By this stage, there were 565,169 cases remaining. Of these cases, 15,247 (2.7%) had at least one piece of relevant data missing and so were removed. This meant there were 549,922 cases remaining.

Postcode data in the dataset was used to create two new fields, which indicated the POLAR quintiles and IMD deciles of the neighbourhoods in which pupils resided. 'POLAR' (an acronym

standing for Participation Of Local AReas) is a measure used to gauge geographical inequalities in HE access. It is established by calculating the proportion of young people in each neighbourhood (Middle-Layer Super Output Area) in the United Kingdom who attend university by the age of 19, and all neighbourhoods are assigned to one of five quintiles based on their rate of young HE participation (Office for Students, 2020a). Postcode data was downloaded from the Office for Students website, which could be used to reference postcodes against POLAR quintiles (Office for Students, 2020b). 'IMD' (Index of Multiple Deprivation) is the official measure of relative deprivation in England and is drawn together using data concerning neighbourhood levels of income, employment, health deprivation and disability, education skills and training, crime, barriers to housing and living environment (Ministry of Housing Communities & Local Government, 2019). Again, a postcode file was accessed—this time from the ONS Open Geography Portal—which referenced postcodes against IMD rankings (Office for National Statistics, 2016), and these rankings were collapsed into a 10-point decile scale.

Finally, a new field was created in the NPD dataset, which would indicate whether or not pupils progressed to a high-tariff HE provider by the age of 19; the value of this field was determined through the use of the HESA datasets. A list of high-tariff providers for the 2017–2018 academic year was obtained from the DfE website (Department for Education, 2020), and this list was used to code HE providers within the HESA datasets as either high-tariff or not high-tariff. Students were considered to have progressed to a high-tariff provider if they were marked in the HESA data as being a member of the 'standard HE registration population' at such a provider during either the 2017–2018 and/or the 2018–2019 academic year. Those students who were not identified as attending a high-tariff provider were either attending a low or medium-tariff provider or they had not progressed to HE at all. The use of two cohorts of HESA data meant that progression up to age 19, rather than age 18, could be captured. This meant that students who had taken a year out of the education system, perhaps to undertake a 'gap year', could be included in the analysis. This is an important step to remove bias, given that some research suggests that those students who elect to take a gap year may not be representative of the wider student population (Jones, 2004).

To summarise, Table 2 shows the fields in the national cohort dataset alongside summary notes that specify the official names of NPD variables used.

Generating a statistical model

Next, the dataset described in Table 2 was used to generate a statistical model (in this case a logit model) that could predict the likelihood of a young person progressing to high-tariff HE based on their gender, ethnicity, FSM status, neighbourhood characteristics and school attainment. These particular characteristics were chosen for the model, since previous research has suggested that these characteristics tend to be predictive of the likelihood of progression to HE, and also high-tariff HE in particular (Crawford & Greaves, 2015; Croll & Attwood, 2013; Department for Education, 2023; Montacute & Cullinane, 2023; Richardson et al., 2020). When it came to pupil attainment, a decision was taken to include a measure that could capture what type of qualifications pupils were achieving, in addition to the level of attainment. This was achieved through the inclusion of a variable showing whether or not pupils had met the criteria of the 'English Baccalaureate' by achieving at least a Grade C in GCSE English language, English literature, mathematics, at least two science qualifications, a language and either history or geography. The English Baccalaureate measure therefore captures whether or not pupils have demonstrated competence in a number of more traditional academic subjects. Previous research has suggested that holding qualifications in these traditional academic subjects (sometimes referred to as the 'facilitating subjects') is predictive of progression to high-tariff HE (Dilnot, 2016).

TABLE 2 Details of the fields in the national cohort dataset.

Field	Description
Gender	Sourced from the 'KS4_FEMALE' variable in the NPD. Note that this is a dichotomous variable and that no value other than male (0) or female (1) can be recorded in the NPD.
Ethnicity	Sourced from the 'KS4_ETHNIC' NPD variable. There are 98 ethnic codes in the NPD; these were collapsed down to 17 subcategories used by the DfE (which can be seen in Table 3). For the purpose of analysis, this field was recoded as a series of dummy variables, referenced against the White British subcategory.
FSM status	Sourced from the 'KS4_FSM' NPD variable. A dichotomous field where pupils are recorded as either being in receipt of FSM (1) or not being in receipt of FSM (0).
IMD decile	A measure of neighbourhood deprivation, derived from the 'KS4_PPCODE' NPD variable, which shows pupil postcode.
POLAR quintile	A measure of neighbourhood HE participation, derived from the 'KS4_PPCODE' NPD variable, which shows pupil postcode.
Key Stage 4 points score	The 'KS4_PTSCNEWE_PTQ_EE' NPD field, which provides a points score for pupils' best eight GCSE (or equivalent) grades. This is on a scale, where a grade A* is awarded 58 points, an A is awarded 52 points, a B 46 points (and so on, descending by 6 points for each grade interval). The 2014–2015 academic year was the last year in England when all GCSEs were graded on a lettered, as opposed to a numbered, scale.
English Baccalaureate marker	The 'KS4_EBACC_PTQ_EE' NPD field, which indicated whether pupils have (1) or have not (0) met the criteria for the English Baccalaureate, which involves achieving at least a Grade C in English language, English literature, mathematics, at least two science qualifications, a language and either history or geography.
Selective university marker	Derived from the linked HESA data and indicates whether pupils are (1) or are not (0) recorded by age 19 as being in the standard HE registration population at a HE institution designated by the DfE as 'high tariff'.

Abbreviations: FSM, free school meals; HE, higher education; IMD, Index of Multiple Deprivation; NPD, National Pupil Database; POLAR, Participation Of Local AReas.

To create the model, a binary logistic regression analysis was performed where the dependent variable was set as whether or not pupils had progressed to high-tariff HE, and all other pupil characteristics were set as independent variables. Table 3 shows the regression coefficients that resulted from the analysis.

Little can be inferred from these regression coefficients themselves, however, they can be used as part of Equation (1), which predicts the likelihood of a young person progressing to high-tariff HE based on the characteristics listed above.

$$p = \frac{1}{1 + e^{-(B_1 X_1 + B_2 X_2 + \cdots + B_{23} X_{23} + B_0)}} \tag{1}$$

In this equation, p is the probability on a scale from 0 (impossible) to 1 (certain) of a pupil progressing to high-tariff HE. The X values in the equation represent the different variables listed in Table 3, and the B values represent the corresponding regression coefficients. B_0 represents the regression constant, also shown in Table 3. The use of regression coefficients in this manner to predict probabilities is described in Cohen et al. (2003). One can use such an equation to make a binary prediction as to whether or not a pupil will progress to high-tariff HE by predicting that they will progress if the predicted probability is greater than 0.5 (or 50%) and predicting that they will not progress if the predicted probability is less than 0.5. When used is this manner, the equation (or model) predicts the correct outcome 92.5%

TABLE 3 Regression coefficients resulting from the binary logistic regression analysis.

Variable	Regression coefficient
Is the pupil female	−0.2876
Neighbourhood POLAR quintile	0.1204
Neighbourhood IMD decile	0.0262
Is the pupil in receipt of free school meals	−0.0449
Any other Asian ethnicity	0.2587
Any other Black ethnicity	0.3573
Any other ethnicity	0.2416
Any other mixed ethnicity	0.2257
Any other White ethnicity	0.1990
Bangladeshi ethnicity	−0.0673
Black African ethnicity	0.4912
Black Caribbean ethnicity	−0.0519
Chinese ethnicity	0.7656
Gypsy or Roma ethnicity	0.2337
Indian ethnicity	0.2156
Pakistani ethnicity	0.1671
Traveller of Irish heritage ethnicity	−0.8833
White and Asian ethnicity	0.1965
White and Black African ethnicity	0.1905
White and Black Caribbean ethnicity	0.0145
White Irish ethnicity	0.4380
Key Stage 4 points score	0.0395
Achieved English Baccalaureate	0.1541
Constant	−17.6225

of the time when applied to the original cohort of data from which it was generated. This success rate is an improvement against a baseline success rate of 89.8% where no modelling is used and every case in the original cohort is predicted to not attend a selective university. It should be noted then that the predictive power of the statistical model is only slightly higher (in percentage terms) when compared against the baseline model—this is often the case when there is an uneven distribution of cases across the two possible outcomes and the scope for improvement in predictive power is reduced (Gorard, 2021). It should be borne in mind that the small size of this improvement in the predictive power of the modelling is a limitation of this study.

The statistical model will be drawn upon in the next section, where the results are presented.

RESULTS

In this section, the data and analysis described so far is drawn together with a view to trying to ascertain whether participants in the RO programme are more likely to progress to high-tariff HE than might otherwise be expected.

Initially, a simple comparison was made as to whether RO participants were more likely to progress to high-tariff HE when compared to members of the entire cohort of young people of the same age. Table 4 presents this comparison.

It is clear from this data that participants in the RO programme were considerably more likely to progress to high-tariff HE compared to the average member of the wider cohort of all state school pupils in England. In fact, RO participants on average were more than three times as likely to progress to high-tariff HE compared to members of the same age cohort as a whole. However, further analysis of the data revealed that the RO cohort was certainly not representative of the wider age cohort, as illustrated in Tables 5 and 6.

This data reveals considerable average differences between the character of the RO cohort and the wider cohort of all state school pupils in England of the same age. RO participants are considerably more likely to be female and from ethnic minority backgrounds compared to the national cohort as a whole. They are also more likely to be in receipt of FSM and live in deprived neighbourhoods and/or neighbourhoods where a smaller proportion of young people progress to HE. The RO participants did considerably better in their GCSE examinations at age 16 compared to an average pupil of the same age. With a score 97.57 points above the national average, a typical RO participant achieved roughly two grades higher in their best eight GCSEs than the average pupil. RO participants are also considerably more likely to meet the requirements of the English Baccalaureate.

Given that the aim of the RO programme is to target high-achieving students from disadvantaged backgrounds, this data is encouraging as it suggests that the programme organisers have been successful in meeting this aim. However, because it is clear that the RO cohort is not representative of the wider population, the simple comparison presented

TABLE 4 Comparing rates of progression to high-tariff HE between RO participants and the cohort as a whole.

	Size of cohort	Number progressing to high-tariff HE by age 19	Percentage progressing to high-tariff HE by age 19
RO participants (2015–2017)	769	248	32.2
All state school pupils in England who turned 16 in 2014–2015	565,169	57,687	10.2

Abbreviations: HE, higher education; RO, Realising Opportunities.

TABLE 5 Comparison of some of the characteristics of the Realising Opportunities (RO) cohort and the entire age cohort (missing values excluded before percentages calculated).

Characteristic	Percentage within the RO participants (2015–2017)	Percentage within all state school pupils in England who turned 16 in 2014–2015
Female	68.2	48.7
In receipt of FSM	28.6	12.8
White British ethnicity	49.7	75.4
Residing in IMD decile 1 (most deprived neighbourhoods)	30.0	12.0
Residing in POLAR quintile 1 (neighbourhoods of lowest young HE participation)	27.0	20.1

Abbreviations: FSM, free school meals; HE, higher education; IMD, Index of Multiple Deprivation; POLAR, Participation Of Local AReas.

TABLE 6 Comparison of average attainment within the RO cohort and the entire NPD cohort.

Attainment measure	RO participants (2015–2017)	All state school pupils in England who turned 16 in 2014–2015
Mean Key Stage 4 points score	402.30	305.73
Percentage of pupils achieving English Baccalaureate	62.9	23.7

Abbreviations: NPD, National Pupil Database; RO, Realising Opportunities.

TABLE 7 Frequency and proportion of the RO cohort predicted to progress to high-tariff HE.

	Predicted to progress		Observed progressing	
	Frequency	Percentage	Frequency	Percentage
Progression to high-tariff HE among the RO participants ($n = 769$)	107	13.9	248	32.2

Abbreviations: HE, higher education; RO, Realising Opportunities.

in Table 4 cannot be used to infer that that higher progression rates to high-tariff HE are being driven by the RO programme itself, because these higher progression rates could be explained by other confounding variables such as the higher average attainment of the RO participants.

This is where the statistical model, shown as Equation (1), comes into play. When making predictions about the likelihood of a young person progressing to high-tariff HE, it takes into consideration the young person's attainment and other personal characteristics. Therefore, when the model is applied to the cohort of RO participants, the non-representative nature of this cohort is factored in.

All 769 of the RO participants were fed through the model shown in Equation (1), and for each participant a probability (on a scale of 0 to 1) was obtained for the likelihood of them progressing to high-tariff HE based on their prior attainment and other personal characteristics. Binary predictions were also made as to whether or not a participant would ordinarily be expected to progress to high-tariff HE—it was predicted that participants would progress to high-tariff HE if their estimated probability was greater than 0.5 (or 50%) and it was predicted that they would not progress if their probability was lower than 0.5 (no participants had a predicted probability of 0.5 precisely). Table 7 summarises the results.

Of the 769 RO participants, just 107 (13.9%) were predicted to progress to high-tariff HE based on their attainment and other personal characteristics. To reiterate the actual progression figures first presented in Table 4, the actual number of RO participants who were observed progressing to high-tariff HE was 248 (or 32.2% of the cohort). The number of RO participants progressing to high-tariff HE is more than twice as high as might otherwise be expected, suggesting that participation in the RO programme is positively associated with an increased likelihood of progression to high-tariff HE.

CONCLUSION AND DISCUSSION

The analysis presented in this paper would seem to suggest that the simple answer to the question that is posed as the paper's title is *yes*—RO participants do indeed seem to be more likely to progress to selective universities than would otherwise be expected, even once their non-representative nature is taken into consideration. This would suggest that

the RO programme appears to be broadly successful in meeting its aim of facilitating the progression of students from a disadvantaged background to more selective universities. In a broader sense, the RO programme may also support the promotion of greater social mobility, insofar as those young people with qualifications from more selective universities are more likely to be paid higher salaries on entering the labour market. This finding chimes with other published literature, which has considered the effectiveness of widening participation outreach programmes, with three literature reviews completed on the subject broadly concurring that most evaluations of outreach programmes such as RO tend to report positive effects (Gorard et al., 2006; Moore et al., 2013; Robinson & Salvestrini, 2020). The analysis presented in this paper also triangulates the findings of an earlier evaluation of RO, which uses a different method of comparing HE progression rates of RO participants against those of a matched-comparator group of non-participants with similar characteristics (Williams & Mellors-Bourne, 2019).

However, the results of the analysis presented in this paper should be interpreted with some caution. Whilst the method used was able to adjust for various *observable* differences between the RO participants and the wider age cohort (such as attainment and demographic differences), it was not able to adjust for the myriad *unobservable* differences that may well exist between the RO participants and the wider age cohort. Young people must choose to apply to take part in the RO programme, and those who take the initiative to apply may differ on average in various respects when compared to those who do not take this initiative. This phenomenon is often referred to as 'selection bias' (Haynes et al., 2013; Kenny et al., 1979). Young people who take the trouble to apply to programmes such as RO might have a pre-existing inclination towards HE and perhaps towards selective universities in particular. They might also be more motivated and driven to meet their future goals when compared to otherwise similar young people who do not take the trouble to apply. Given that unobservable differences between the RO participants and the wider cohort could not be taken into consideration, this study cannot be seen to demonstrate a *causal* effect of the RO programme. This is certainly not to say that it should be concluded that the RO programme does not have a causal effect on participants, however a different methodology (e.g., an experimental trial) would be required to confirm whether the effect is causal or not.

The evaluation of the RO programme presented in this paper should therefore be seen as sitting at 'Level 2' and not at 'Level 3' of the evaluation hierarchy presented by Crawford et al. (2017). This also means that this study does not address the problem of the lack of causal evidence in this area remarked upon in previous literature reviews (Gorard et al., 2006; Moore et al., 2013; Robinson & Salvestrini, 2020). However, even though a causal inference cannot be made from this analysis, one thing that has been avoided is the ruling out of the effectiveness of the RO programme. If the RO participants had not been observed progressing to selective universities at a higher rate than predicted by the modelling, then it might be assumed that the programme was not effective. As it stands, the present analysis provides an estimate of the upper bound of the causal effect of the RO programme, though it is still possible (at least in principle) that no causal effect might be observed if all possible confounding variables could be accounted for.

It is also possible that the result observed could reflect to some extent the use of the 'alternative offer', whereby RO participants who make applications to participating universities are made lower A-level (or equivalent) grade offers than they otherwise might, had they not participated in RO (having said this, some applicants from disadvantaged backgrounds may still receive lower 'contextual offers' from universities even if they have not taken part in an outreach programme). It is not possible to disentangle any possible effect of this from the effect of participating in the programme itself. Similarly, RO is a 'black box' programme, comprised of a package of multiple different interventions. The method used in this study is not able to disentangle the effects of particular elements of the programme, and it is possible

that some elements of the programme could be more effective than others. This is an issue that the programme providers might be able to investigate further themselves, for example by using participant destination data alongside programme engagement data to try to ascertain which elements of the programme the most successful students tend to engage with the most.

This study has used a novel method to try to gauge the effectiveness of a widening participation outreach programme. The method has involved leveraging an entire cohort of government administrative data about young people in England to judge the effectiveness of an intervention administered to only a small subset of this cohort. The study demonstrates how large national datasets such as the NPD can be exploited in this way, something which has very seldom been seen in the literature so far on this topic. In the future, if the *direct* linkage of government administrative datasets with data concerning participants of different interventions becomes easier, this is likely to further enhance the utility of such administrative datasets.

This study has also involved the generation of a statistical model that can predict the likelihood of a young person progressing to high-tariff HE based on their school attainment and other personal characteristics (in the same process, a second model predicting progression to HE in general was also generated). Such models may have further applications beyond this study. For example, they might be applied to data concerning participants in other outreach programmes. This could allow for comparison of the relative effectiveness of different programmes, enabling researchers to assess which programmes might offer the best returns on the investment of time, money and other resources. As noted earlier, it should be borne in mind that the improvement in the predictive power (against a baseline level) of the particular model used in this research was relatively small, and this remains a limitation of this study.

Finally, predictive statistical models might also be used as a way of ensuring that appropriate cohorts of students are recruited to take part in outreach programmes in the first place. It is interesting to note in this study that only a relatively small minority (13.9%) of the RO participants were predicted to progress to high-tariff HE based on their prior attainment and other characteristics. This gave the programme providers a large margin for improvement as there were clearly many participants who may not have been destined for high-tariff HE but who may then have been moved on to that pathway as a result of their participation in the programme. Evaluations of other programmes that support students to progress to HE in general—such as the summer schools evaluation by TASO (2022)—sometimes report that participants appear to have a very high likelihood of progression to HE even prior to taking part in the outreach intervention. In response, the TASO evaluators remarked that it is 'imperative that providers target students who may enrol in HE after taking part in the intervention, but who would not enrol without it' (TASO, 2022: 27). The use of appropriate statistical models could assist with this endeavour, to avoid a situation where outreach providers are simply 'preaching to the converted' by targeting students who, despite being from a disadvantaged background, may still be likely to progress to HE anyway—even in the absence of an outreach intervention. When this occurs, there is no margin for improvement and as such no opportunity for the programme to achieve an aim of changing participant outcomes, no matter how well designed the programme itself might be.

CONFLICT OF INTEREST STATEMENT

There are no conflicts of interest to report.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the Department for Education and the Higher Education Statistics Agency. Restrictions apply to the availability of these data, which were used under licence for this study. Data are available at https://www.gov.uk/guidance/apply-for-department-for-education-dfe-personal-data, with the permission of the Department for Education.

ETHICS STATEMENT

This research was carried out following ethical guidelines from the British Educational Research Association and was granted ethical approval by the University of Warwick.

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