Educational Review

ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/cedr20

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**To cite this article:** Paul Martin (2021): Exploring the relationship between the characteristics of English schools and the progression rates of their pupils to degree-level study, Educational Review, DOI: 10.1080/00131911.2021.1978395

**To link to this article:** https://doi.org/10.1080/00131911.2021.1978395

EDUCATIONAL REVIEW
https://doi.org/10.1080/00131911.2021.1978395

Routledge
Taylor & Francis Group



# Exploring the relationship between the characteristics of English schools and the progression rates of their pupils to degree-level study

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**ABSTRACT**

This article explores the extent to which three different school or college characteristics are related to school or college-level progression rates to higher education. Using data from publicly available datasets concerning state schools and colleges in England, linear regression analyses were performed to investigate the extent to which progression rates to higher education are related to the proportion of socioeconomically disadvantaged pupils within schools, the proportion of pupils in schools who reside in "low participation neighbourhoods" and the effectiveness of schools as determined through Ofsted inspections. Schools with a higher proportion of socioeconomically disadvantaged pupils tend to send fewer pupils to university though once school-level attainment is controlled for this trend reverses. However, schools with higher proportions of pupils in low participation neighbourhoods and those with lower Ofsted ratings tend to send fewer pupils to university both before and after school-level attainment is controlled for. The findings are interpreted within the context of a widening participation agenda and suggestions are made for how providers of widening participation outreach activities may most effectively target school-level interventions designed to increase higher education participation, especially those which do not have the effect of raising pupil attainment.

**ARTICLE HISTORY**
Received 24 November 2020
Accepted 6 September 2021

**KEYWORDS**
Widening participation; higher education; fair access; outreach programmes

## Introduction

It is well established that the subset of young people who progress into Higher Education (HE) in England is not entirely representative of all young people within the wider English population (Crawford et al., 2016). Unsurprisingly, there is a very close relationship between pupils' level of attainment in school or college and their likelihood of progressing into HE (Croll & Attwood, 2013; Gayle et al., 2002). However, the likelihood of progression into HE would also appear to be related to several other factors including school type attended (Crawford, 2014), the geographical area in which a young person resides (Department for Education, 2020) and also personal characteristics such as gender, ethnicity and socioeconomic background (Crawford & Greaves, 2015).

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This article has been corrected with minor changes. These changes do not impact the academic content of the article.

Disparities in rates of HE access between different groups of young people are an obvious cause for concern given that there would appear to be several benefits associated with attending HE. For example, there remain clear financial advantages associated with HE attendance and for most graduates their additional earnings premium more than offsets the costs associated with attending a university (or other HE provider) (Belfield et al., 2018; Britton et al., 2020). Furthermore, there may also be a range of non-financial benefits linked to HE attendance since graduates tend to report higher levels of health and wellbeing in later adulthood than non-graduates (Brennan et al., 2013). Given the multiple benefits of HE, addressing the underrepresentation of certain groups of young people within the HE system is likely to be especially important in enabling upwards social mobility and reducing the likelihood of patterns of disadvantage from simply being reproduced across generations. Furthermore, many young people are simply likely to want to attend university, perhaps since they recognise the value of education in and of itself irrespective of any other advantages which may be conferred on university graduates. In a socially just society, disadvantage ought not to act as a barrier to access.

In this article statistical analysis will be used to explore the relationship between certain school and college characteristics and school and college progression rates to HE. The analysis will then be interpreted with a view to identifying the characteristics of schools or colleges which may benefit the most from interventions designed to raise HE participation, with a particular focus on interventions which do not necessarily have the effect of raising pupil attainment.

The following two research questions will be addressed:

(1) How are progression rates to HE from English schools and colleges related to the proportion of socioeconomically disadvantaged pupils within the school or college, the proportion of pupils who reside in "low participation neighbourhoods" and the effectiveness of the school or college as judged by Ofsted (both before and after school-level attainment is controlled for)?
(2) How are progression rates to selective high-tariff universities from English schools and colleges related to the proportion of socioeconomically disadvantaged pupils within the school or college, the proportion of pupils who reside in "low participation neighbourhoods" and the effectiveness of the school or college as judged by Ofsted (both before and after school-level attainment is controlled for)?

## Literature review

### *Widening participation in higher education*

In recent decades a political consensus has emerged in the UK in which successive governments of different ideological orientations have all agreed on the importance of promoting social mobility by enabling more young people from disadvantaged backgrounds to access HE. Evidence of this can be found by scrutinising speeches and policy documents linked to the "New Labour" administration which came to power in 1997 (Department for Education and Skills, 2003), the Conservative and Liberal Democrat coalition government which came to power in 2010 (Department for Business, Innovation & Skills, 2013) and then the later Conservative administration (Greening,

2017). Whilst there are some government ministers who have recently signalled a move away from the policy agenda of enabling more disadvantaged young people to enter HE (Donelan, 2020; Williamson, 2020), the official policy of the Office for Students (England's HE regulator) is that HE providers must strive to achieve the long-term target of eliminating gaps in HE entry rates between the most and least represented groups (Office for Students, 2020).

From the mid-1990s onwards, the term "widening participation" (WP) has typically been used to refer to the broader effort to enable those who are from disadvantaged or underrepresented backgrounds to progress into HE (see, for example, Sanders, 1994; Uden, 1996), though the precise definition of WP is likely to remain contested (Stevenson et al., 2010). More recently, government regulators have begun using the term "access and participation" as opposed to WP, a term which has a broader scope covering access to HE in the first place as well as the extent to which different groups of students are successful on their degree programmes and then progress on to appropriate destinations after graduation (Office for Students, 2018). Since this article focuses on HE access, the term WP will be used as opposed to access and participation.

There are many different strategies which may be used to try to widen access to HE. These strategies include the drive to reduce socioeconomic attainment gaps in schools through the use of additional "pupil premium" funding (Laws & Morgan, 2013), providing socioeconomically disadvantaged students with additional scholarships and bursaries (Kaye, 2020) and the use of contextual admissions policies which may result in disadvantaged or underrepresented students being admitted to universities with lower entry requirements than would otherwise be required (Boliver et al., 2019). This article, however, will focus on another strategy which is the use (and targeting) of outreach interventions. In this article the term "outreach" will be used to refer to interventions aimed at improving HE access for the disadvantaged or underrepresented which go beyond financial aid and contextual admissions policies (and also interventions which are not simply initiatives implemented by schools and colleges themselves).

## *WP outreach activities*

In their review of the effectiveness of WP outreach interventions, Robinson and Salvestrini (2020) illustrate the wide range of different WP outreach activities which take place including interventions that provide "information, advice and guidance", mentoring and counselling, residential summer schools and "black box" interventions which combine two or more of these components. Over recent decades, a sizeable industry of WP outreach has emerged which has in large part been encouraged by government (Department for Business, Innovation & Skills, 2013). For example, in 2004 the government created the AimHigher programme – a multimillion pound initiative aimed at building better links between schools, colleges and universities and raising the HE aspirations of young people, especially those from disadvantaged backgrounds (Department for Education and Skills, 2003). By 2012, universities had been allowed to raise their tuition fees to an all-time high (at the time) of £9,000 per year for undergraduate students; however, universities could only charge this amount if some of the extra revenue from these higher fees was spent on initiatives to encourage more disadvantaged students to attend (Department for Business, Innovation & Skills, 2011). This policy incentivised universities to develop their own extensive outreach

operations and these operations were supplemented by the continued development of government sponsored national outreach programmes (such as the Office for Students' Uni Connect programme) as well as a range of outreach activities delivered by charitable third-sector organisations such as The Sutton Trust, **Into**University and The Brilliant Club.

The scale of the WP outreach industry can be illustrated by the considerable amount of money that is invested in outreach each year. The Office for Students (2019a) reports on the level of planned investment in "access activity" (which does not include financial support such as bursaries and scholarships) by 171 English HE providers. Through their Access and Participation plans (documents which HE providers must produce which set out the steps they are taking to reduce access inequalities) these providers estimate that they will spend £197.9 million on outreach activity in the 2020–21 academic year and this figure is estimated to rise steadily over the following four academic years, reaching an estimated £212.2 million for the 2024–25 academic year.

Given that there is such a close connection between attainment and the likelihood of young people attending university (Croll & Attwood, 2013), it can be reasonably assumed that any intervention which increases school or college-level attainment would also be likely to result in increased HE progression from that school or college. However, raising attainment in schools and colleges can be a very difficult task and may often be beyond the scope of WP outreach activities. The evidence on the effectiveness of university-led initiatives to raise attainment at the school or college level is limited; for example, an analysis of the performance of university technical colleges (schools which universities have either set up or sponsor in their local communities) shows that these organisations tend to have lower levels of average attainment when compared against schools or colleges which have not been set up or sponsored by universities (Dominguez-Reig & Robinson, 2018). This could suggest that universities are not entirely effective in raising the quality of teaching and learning which takes place in schools and colleges. The analysis presented in this article was carried out with a view to identifying the characteristics of schools and colleges which may benefit the most from outreach interventions, especially those that do not have the effect of raising pupil attainment. This includes outreach activities which aim to raise pupils' HE aspirations or improve the quality of information, advice and guidance provided to pupils. It should be noted at this point that in recent times there has been a slight shift within some parts of the WP community away from the narrative of "raising aspirations" and towards the idea of "raising expectations" (Harrison & Waller, 2018). There is also some evidence to suggest that young people's average levels of aspiration are also reasonably consistent across different social class groups (Kettley & Whitehead, 2012). Nonetheless, there are many WP outreach activities which continue to focus on various ways of offering encouragement for young people to attend HE despite the fact that the aspirations discourse continues to be contested. Whilst this article will consider where might be the best places to target WP interventions which may not raise attainment, it is accepted that more work may be needed to identify the best mechanisms by which HE participation may actually be increased.

## *Targeting outreach work effectively*

Given the amount of time, effort and money invested in WP outreach, there is pressure on outreach providers to demonstrate that their work is effective in meeting its aims. For example, the Office for Students has a new key performance indicator in development

which is a measure of the ratio of outcomes achieved through access and participation to money spent on access and participation (Office for Students, 2019b). Several literature reviews have been published which have aimed to analyse existing published research on the effectiveness of WP outreach activity (see, for example, Gorard et al., 2006; Moore et al., 2013; Younger et al., 2019). A recurring theme in these literature reviews is that whilst there are many signs of promise to be found in published research, more work is needed (and work of better methodological rigour) to understand the true extent of the effectiveness of WP outreach. However, whilst there is a growing body of research on the subject of whether WP outreach is effective, there is less research to be found on the subject of how to best target WP outreach in the first place. Whilst much outreach evaluation involves looking back to see whether an intervention has been effective, it is also important that outreach interventions are designed carefully so that they stand the greatest chance of being effective, for example, by ensuring they are driven by an appropriate theory of change (see, for example, Barkat, 2019).

Given the aims of the broader WP project, outreach programmes are best targeted at individuals in those groups which are known to be either disadvantaged or underrepresented as opposed to individuals in those groups which have a more established tradition of progression to HE. Robinson and Salvestrini (2020) report that WP initiatives typically target groups of individuals with certain characteristics, such as socioeconomically disadvantaged learners, care leavers or mature students. Consequently, many outreach initiatives are likely to be made available exclusively for individuals who meet certain criteria. For example, a university might organise an online mentoring programme and only make this available to pupils who are eligible for free school meals, are looked after in local authority care or who are part of the first generation in their family to go to university. Yet with certain WP outreach activities, it may only be possible in practice to target these activities at the school or college level as opposed to the individual pupil level. Examples of such interventions might include school assemblies in which current undergraduate students provide inspirational testimonials of their experiences of HE, classroom-based activities in which outreach staff coach entire classes of Year 12 pupils on how to write effective personal statements for UCAS applications or CPD (Continuing Professional Development) activities with teachers and career advisers in schools in which participants are taught how to provide their students with the most effective guidance about HE. WP outreach providers must decide how to best target these kinds of school or college-level interventions, but what are the characteristics of the schools and colleges which would be most likely to benefit from them?

There is some evidence to suggest that different types of schools may offer differential levels of support when it comes to helping their pupils to put together university applications. For example, Jones (2013) finds that personal statements (short pieces of writing which pupils submit to universities as part of their applications) written by pupils in state comprehensive schools and sixth form colleges contain more spelling, punctuation and grammar mistakes when compared to those written by pupils (with the same attainment) in grammar schools and independent schools. This could suggest that in certain schools applications are checked less thoroughly by staff than in others and interventions which encourage staff to offer more support with applications could then result in an increase in the quality of applications. On the other hand, there is other evidence to suggest that schools and colleges are only likely to increase the likelihood of

their pupils progressing to university by increasing their attainment and not by other means such as offering more effective guidance. Crawford (2014) finds that there are a range of school characteristics which are related to the likelihood of university progression (such as school selectivity, the proportion of pupils on free school meals and whether the school has an attached sixth form), however, once different levels of attainment and other variations in pupil characteristics are controlled for these differences reduce to almost zero.

In this article, three different school and college characteristics will be explored with a view to investigating whether they may be a good basis for effective targeting of WP outreach activities. The first characteristic will be the proportion of socioeconomically disadvantaged pupils within schools. Socioeconomic disadvantage will be determined by establishing whether pupils have been in receipt of free school meals or have been looked after in local authority care. Evidence suggests that free school meals remains a useful proxy for socioeconomic disadvantage (Ilie et al., 2017). The second characteristic to be considered will involve identifying the proportion of disadvantaged pupils in schools in a more geographical sense as opposed to in a socioeconomic sense. "POLAR" (Participation Of Local AReas) is a classification initially developed by the Higher Education Funding Council for England. POLAR classifies local areas into one of five quintiles based on the proportion of young people in the area who enter HE at either 18 or 19 years old (Office for Students, 2019c). Quintiles 1 or 2 (which represent the 40% of areas with the lowest participation) are often referred to as "low participation neighbourhoods" (LPNs). Different versions of the POLAR classification exist which correspond to different points in time. In this research, the third version of POLAR (POLAR3) is used as this corresponds best to the time frame being considered. Whilst there is some correlation between socioeconomic disadvantage and geographical disadvantage as measured by POLAR, the association between the two is fairly weak and evidence suggests that there are in fact many advantaged families (in a socioeconomic sense) residing in LPNs and many poorer families who reside in areas of higher participation (Harrison & McCaig, 2015). Given this weak connection, these two different measures of disadvantage would appear to be measuring quite different things, and it is for this very reason that both of these different measures of disadvantage will be considered separately. It may be the case that some pupils could be disadvantaged simply by residing in certain neighbourhoods (such as those in more remote areas, or those where there are not very many universities nearby) even if they do not live in households which have a low income. Furthermore, despite criticisms of POLAR it is likely to remain in focus as a measure of disadvantage given that it appears to be the preferred measure used by the Office for Students in the formulation of their key performance indicators for the HE sector (Office for Students, 2019b).

The final school or college characteristic to be considered will be the effectiveness of schools as measured by Ofsted inspections. Ofsted is the term used to refer to the Office for Standards in Education, a non-ministerial government department which carries out routine inspections of all state schools in England in order to provide "an independent assessment of the quality of provision" (Office for Standards in Education, 2017, p. 3). Whilst a high value has been placed on the outcomes of Ofsted inspections by both schools and parents, there has been relatively little research undertaken which has analysed the relationship between the quality of schooling young people are exposed

to (as determined by Ofsted inspections) and the various outcomes experienced by young people. Research so far suggests that the significance of school quality as measured by Ofsted may be limited with one study finding that, after other factors were controlled for, only 1% of variance (at pupil level) in GCSE examination results could be explained by the Ofsted rating of the school which a pupil attended (Von Stumm et al., 2020).

## Methods

The analysis presented in this article concerns both schools and also Further Education (FE) colleges. For ease, from this point the term "school" will simply be used, although whenever this appears it can be assumed to refer to both schools (with sixth forms) and FE colleges.

The remainder of this article will proceed as follows. Firstly, the process by which data about schools in England was gathered will be explained. Next, the three different characteristics about schools which have been discussed will be considered in turn. For each characteristic, the raw relationship between the characteristics and rates of HE progression will be considered but also the extent to which the characteristics are related to rates of HE progression after school-level attainment is controlled for. If school-level gaps in HE progression are not explained by school-level differences in attainment, this may help to identify the characteristics of schools which would benefit from WP outreach interventions which do not raise attainment. The article concludes with a discussion of how WP outreach providers can make the best use of evidence to ensure that their WP initiatives are targeted at the schools which are most likely to benefit from these initiatives.

In this article aspirations are considered to be distinct from attainment, meaning that once attainment has been controlled for statistically any remaining differences in progression rates to HE could potentially be explained by differences in aspiration (among other unobserved factors). It could be argued that WP outreach, which aims to raise aspirations in fact raises attainment in an indirect sense, if those with higher aspirations are then spurred on to put more effort into their studies. However, it is far from clear that higher levels of attainment result from higher levels of aspiration and if there is a causal connection between these two attributes, then it may well be the case that higher attainment drives higher aspirations and not the other way around (Cummings et al., 2012).

### *Data collection*

School-level data was gathered and collated using a range of publicly available datasets. The first set of data obtained was the Department for Education's 16 to 18 destinations dataset (Department for Education, 2019) which contains school-level data showing the proportions of school cohorts which have progressed to degree-level study (and also the proportions progressing to more selective universities). This data concerns pupils who studied post-16 level 3 qualifications (such as A levels and BTEC qualifications) at state-funded mainstream institutions and completed their level 3 studies in the 2015 to 2016 academic year. Pupils are counted as progressing to degree-level study if they begin their HE studies in the 2 years after completing their level 3 study and this allows for pupils who

took a single gap year to be included in the destinations data. To be included in destinations statistics, pupils must be recorded as having sustained participation at their given destination for a period of at least six consecutive months.

For each school in England the following data fields were gathered from this first dataset: the number of level 3 pupils in the cohort who finished their studies in 2016, the percentage of these pupils who progressed to degree-level study in the next two years, the percentage of pupils who progressed to degree-level study at a selective institution within the next two years and finally the number of level 3 pupils in the cohort who were classified as "disadvantaged". The Department for Education's definition of a selective institution is an institution which is in the top one-third of all institutions when they are ranked according to the mean UCAS A level tariff score of entrants and a pupil is classified in this data as "disadvantaged" if they were eligible for the pupil premium when they were in Year 11 (Department for Education, 2019). Pupils are eligible for the pupil premium if they are in receipt of free school meals (or have been at any point in the last 6 years) or if they have been looked after in local authority care. Since for each school the total number of level 3 pupils was known and the number of disadvantaged level 3 pupils was also known, an additional field was created by calculating the percentage of disadvantaged pupils in each school's cohort.

This first dataset contains data from 2393 mainstream schools, colleges and sixth form centres. Since the data analysis involved looking at percentages of pupils in the cohorts who met certain criteria (e.g. percentage of disadvantaged pupils or percentage of pupils who progress to selective universities) it was judged that these statistics could be unreliable for schools with minimal cohorts since differences in small numbers of pupils could exert a large influence on the size of these percentages. As a result, 156 schools with cohort sizes of fewer than 25 pupils were excluded, leaving 2237 schools remaining. In schools where there were fewer than six disadvantaged pupils (but not zero) the precise number of disadvantaged pupils was suppressed and not published. In these cases, estimates were made of the number of disadvantaged pupils in the school cohort based on the overall size of the cohort. Schools were grouped into five quintiles according to their overall size and those in the first quintile were assumed to have one disadvantaged pupil, those in the second quintile were assumed to have two disadvantaged pupils and so on.

Next, data about school-level attainment was obtained. This data is also publicly available and can be used to compile school performance tables. The school-level dataset with Key Stage 5 attainment data for the 2015 to 2016 academic year was downloaded from the Government's "Find and compare schools in England" website (HM Government, 2020a). Two different attainment statistics were obtained for each school and these were average points score per academic entry (this includes qualifications such as A levels, AS levels and the International Baccalaureate), and average points score per applied general entry (these are vocational qualifications which involve applied learning and include many of Pearson's BTEC qualifications). School attainment data for entries in Tech level qualifications was not gathered (these include, for example, some City and Guilds qualifications and are not to be confused with "T level" qualifications). This data was not used since these qualifications are not typically intended to enable progression into HE and instead are designed to enable pupils to progress immediately into a particular occupation. School-level data on both academic and applied general attainment was combined

to create a single, overall attainment score for each school. Whilst the average academic and applied general attainment scores are on the very same 0–60 "performance points" scale, on average applied general point scores tend to be higher than academic point scores. To take this into account, all schools were ranked into deciles and given a score from 1 to 10 for both their academic and applied general performance based on their performance relative to all other schools nationally. For example, if a school had an academic point score of 40.2 or greater, they would be given a score of 10 for academic attainment since such a score would place the school within the top 10% of school performances nationally. A weighted mean of the academic and applied general decile was then calculated for each school based on the proportion of pupils within the school who were studying each qualification type, giving each school an overall attainment score on a continuous scale from 1 to 10. There were only two schools for which this score could not be calculated since these schools were only offering Tech-level qualifications and so these were excluded from the analysis.

The next piece of school-level data obtained was data about the overall effectiveness of schools as determined by Ofsted inspections. Data concerning the particular Ofsted judgements awarded to schools can be found on the Government's "Get information about schools" website (HM Government, 2020b) and in this dataset schools are reported as being in one of six Ofsted categories: Outstanding, Good, Requires improvement, Serious Weaknesses, Special Measures or Inadequate. Since Special Measures and Serious Weaknesses are schools which are considered by Ofsted to be Inadequate in their overall effectiveness (Office for Standards in Education, 2019) these two categories were collapsed into the Inadequate category. An Ofsted judgement was not found for every school; however, it was available in the vast majority of cases and a classification was found for 2079 out of the 2237 schools for which reliable destinations and attainment data was available. Ofsted inspections typically take place every five years, though some schools with the highest level of effectiveness may become exempt (Office for Standards in Education, 2019) and therefore the ratings used in this study represent a snapshot of the performance of schools over the five-year period preceding the point at which the data was collected in March 2020.

Finally, the last piece of school-level data which was gathered was the proportion of pupils in individual schools who reside in "low participation neighbourhoods". In this case, the only publicly available data which could be found was published by the now-defunct Higher Education Funding Council for England (or HEFCE, which has since been superseded by the Office for Students). In 2016 HEFCE published on their website data concerning the proportion of pupils in individual schools who reside in different wards (HEFCE, 2016). The HEFCE website has subsequently been closed; however, this data was retrieved using the UK Government Web Archive. This dataset contains a list of state-maintained schools in England with Key Stage 4 pupils in the 2013 to 2014 academic year. For each school, the proportion of pupils who reside in each of the 2001 census wards is provided, as is the POLAR quintile of each of these wards. This enabled the proportion of pupils at each school who reside in "low participation neighbourhoods" (i.e. POLAR quintiles 1 and 2) to be calculated. One limitation of this dataset is that only schools are included, and not FE colleges (which were included in the previous datasets). Furthermore, data is not available for schools with fewer than five pupils in any ward. As a result of these limitations, for the 2237

schools identified in the attainment and destinations data, POLAR3 data was only available for 1830 of these schools. However, the fact that this dataset concerns pupils who were in Key Stage 4 in 2014 means that it fits neatly with the attainment and destinations datasets which concern the cohort of pupils who finished Key Stage 5 in 2016.

Before the various datasets were analysed it was necessary to merge them together. This was straightforward in the case of the first three datasets (destinations data, attainment data and Ofsted judgements) because each one contained unique school reference numbers provided by the Department for Education. However, no reference numbers were available in the HEFCE dataset, so in this case the data had to be matched using school postcodes. The vast majority of secondary schools in England do not share a postcode with any other secondary school; however, there are a few exceptions to this rule. To match the HEFCE data, schools in England which do not have a unique postcode were identified first. This small number of schools was matched in to the dataset manually, and then the remaining schools were matched in automatically using their postcodes.

To carry out the analysis, a series of six linear regressions were performed. For each of the three school characteristics of interest, two different linear regressions were performed (one where the dependent variable was set to progression rates to any degree-level study and one where the dependent variable was set to progression rates to high-tariff universities). Each time, independent variables were entered into models in two blocks. For example, in the analyses involving proportion of disadvantaged pupils, the variable for proportion of disadvantaged pupils was entered on its own first so that the raw relationship between this variable and progression rates to HE could be understood. In the second block, attainment was then added into the model so it could be understood how disadvantage is related to HE progression once school attainment is controlled for and held fixed. This same approach was then repeated for the other two school characteristics of interest (i.e. proportions of pupils in LPNs and Ofsted ratings).

It is worth noting two limitations of the analysis with the LPN data. Firstly, LPN data was available for fewer schools (n = 1830) than data concerning the proportion of disadvantaged pupils (n = 2237). However, when the analysis of disadvantaged pupils was repeated, but only for the schools where LPN data was available, the results were broadly similar. Second, the LPN data concerned Key Stage 4 cohorts at the schools concerned, not Key Stage 5 cohorts. This is not ideal since the composition of cohorts could vary across these key stages since for any given school many pupils are likely to leave at the end of Key Stage 4 and also some newcomers could arrive before the beginning of Key Stage 5.

For the linear regressions involving the Ofsted data, a numerical value was used for each school's Ofsted rating and the scale used was the same as that typically used by Ofsted itself, where 1 denotes an Outstanding school, 2 denotes Good, 3 denotes Requires improvement and 4 denotes Inadequate. The Ofsted ratings can therefore be presented on an ordinal scale; however, for the purposes of the analysis this variable was entered as if it were continuous. This comes with a limitation as it assumes that, for example, the difference in quality between an Outstanding school and a Good school is precisely the same as the difference in quality between a Requires improvement school and an

Inadequate school, though in practice this may not be the case. Due to the way that Ofsted's numerical categories are ordered, this of course means that an increase in the Ofsted rating variable represents a decrease in the quality of the school.

## Results

### *Proportion of disadvantaged pupils*

Tables 1 and 2 show the results of the first analysis regarding proportion of disadvantaged pupils where the dependent variable was set as progression rate to all degree-level study.

This analysis shows that there is a slight negative association between the proportion of disadvantaged pupils in schools and school progression rates to degree-level study. In other words, schools with a higher proportion of disadvantaged pupils tend to send fewer pupils on to degree-level study. On average, every 1% increase in the proportion of disadvantaged pupils in schools is associated with a 0.18% decrease in progression rates to degree-level study, though overall very little variation in HE progression rates between schools (only 2%) can be explained by differences in the proportion of disadvantaged pupils.

Something surprising is observed in model 2 once school-level attainment is factored in. Once school-level attainment is controlled for and held fixed, the proportion of disadvantaged pupils in schools becomes *positively* associated with school progression rates to degree-level study. Once attainment is taken into account, each 1% increase in the proportion of disadvantaged pupils in schools is associated on average with a 0.16% *increase* in school progression rates to degree-level study.

**Table 1.** The relationship between the percentage of disadvantaged students and progression rates to degree study.

| Model Summary | | | |
|---|---|---|---|
| Model | N | R | R Square |
| 1 | 2237 | .142[a] | 0.020 |
| 2 | 2237 | .680[b] | 0.463 |

[a]Predictors: (Constant), % of disadvantaged pupils
[b]Predictors: (Constant), % of disadvantaged pupils, school attainment level

**Table 2.** The relationship between the percentage of disadvantaged students and progression rates to degree study (coefficients).

| Coefficients | | | | |
|---|---|---|---|---|
| Model | | Unstandardised coefficients | | Standardised coefficients |
| | | B | Std. Error | Beta |
| 1 | Constant | 65.672 | 0.622 | |
| | % of disadvantaged pupils | −0.178 | 0.026 | −0.142 |
| 2 | Constant | 28.626 | 0.979 | |
| | % of disadvantaged pupils | 0.159 | 0.021 | 0.127 |
| | School attainment level | 5.878 | 0.137 | 0.718 |

**Table 3.** The relationship between the percentage of disadvantaged students and progression rates to high-tariff universities.

| Model Summary | | | |
|---|---|---|---|
| Model | N | R | R Square |
| 1 | 2237 | .354[a] | 0.125 |
| 2 | 2237 | .785[b] | 0.616 |

[a]Predictors: (Constant), % of disadvantaged pupils
[b]Predictors: (Constant), % of disadvantaged pupils, school attainment level

Overall, the analysis makes clear that average school attainment has a much greater bearing on school level HE progression than the socioeconomic character of school cohorts. Once attainment is added into the model, the amount of variance in school level HE progression which can be explained by the model shoots up from 2% to 46% and when disadvantage and attainment are considered together, the influence of the latter on school level HE progression is roughly six times greater than that of the former. It is worth noting, however, that even when both variables are included in the model, the majority of variation in HE progression rates between schools is still left unexplained.

Tables 3 and 4 show the results of the analysis where the dependent variable was set as progression rate to high-tariff universities.

There are some quite noticeable differences in the output once the dependent variable is switched so that it only concerns progression to more selective universities. This time, progression rates are more strongly associated with the disadvantage within school cohorts and every 1% increase in disadvantaged pupils within a school cohort is associated with a reduction of 0.4% in progression rates to selective universities. Disadvantage within school cohorts also explains much more variation this time in progression rates between schools – 12.5% is explained compared to only 2% before.

Unlike in the first regression analysis, the proportion of disadvantaged pupils in school cohorts remains negatively associated with progression rates to more selective universities even once school-level attainment is controlled for, though it is worth noting that this negative association is small. Progression rates to selective universities would appear to be easier to predict using a linear model than progression rates to all universities, and this time the majority of variation between schools (61.6%) can be explained by both the level of disadvantage within school cohorts and average levels of school attainment. As before,

**Table 4.** The relationship between the percentage of disadvantaged students and progression rates to high-tariff universities (coefficients).

| Coefficients | | | | |
|---|---|---|---|---|
| Model | | Unstandardised coefficients | | Standardised coefficients |
| | | B | Std. Error | Beta |
| 1 | Constant | 28.482 | 0.542 | |
| | % of disadvantaged pupils | −0.408 | 0.023 | −0.354 |
| 2 | Constant | −7.541 | 0.764 | |
| | % of disadvantaged pupils | −0.082 | 0.016 | −0.071 |
| | School attainment level | 5.715 | 0.107 | 0.756 |

attainment has a much greater bearing overall on progression rates and exerts an influence which is more than ten times greater than the proportion of disadvantaged pupils when both of these variables are considered together.

### *Proportion of pupils in schools who reside in low participation neighbourhoods*

Tables 5 and 6 show the results of the first analysis regarding proportion of pupils in LPNs where the dependent variable was set as progression rate to all degree-level study.

Much greater variance (26.1%) in school-level progression rates to degree-level study can be explained by differences in the proportion of pupils who reside in LPNs than it can by the proportion of pupils who are socioeconomically disadvantaged (where only 2% of variance was explained). An increase of 1% in the number of pupils residing in an LPN is associated with a 0.25% reduction in progression rates to degree-level study. Crucially, the association between the proportion of LPN pupils in a school and progression rates to degree-level study remains negative even when school-level attainment is added to the model and held fixed. This was not the case with respect to the proportion of socioeconomically disadvantaged pupils within a school cohort.

Taken together, the proportion of LPN pupils in a school and average school attainment account for 45.9% of all variation in school progression rates to degree-level study. Interestingly, the relative influence of the proportion of LPN pupils as measured by the standardised coefficient of −0.329 is reasonably similar in magnitude (though of course of a different sign) to the corresponding coefficient for school attainment (0.481), whereas in the case of proportion of socioeconomically disadvantaged pupils there was a much more considerable difference between these coefficients.

**Table 5.** The relationship between the percentage of students in low participation neighbourhoods and progression rates to degree study.

| Model Summary | | | |
|---|---|---|---|
| Model | N | R | R Square |
| 1 | 1830 | .511[a] | 0.261 |
| 2 | 1830 | .678[b] | 0.459 |

[a]Predictors: (Constant), % low participation neighbourhood
[b]Predictors: (Constant), % low participation neighbourhood, school attainment level

**Table 6.** The relationship between the percentage of students in low participation neighbourhoods and progression rates to degree study (coefficients).

| Coefficients | | | | |
|---|---|---|---|---|
| Model | | Unstandardised coefficients | | Standardised coefficients |
| | | B | Std. Error | Beta |
| 1 | Constant | 74.728 | 0.467 | |
| | % low participation neighbourhood | −0.248 | 0.010 | −0.511 |
| 2 | Constant | 51.698 | 0.976 | |
| | % low participation neighbourhood | −0.160 | 0.009 | −0.329 |
| | School attainment level | 3.570 | 0.138 | 0.481 |

**Table 7.** The relationship between the percentage of students in low participation neighbourhoods and progression rates to high-tariff universities.

| Model Summary | | | |
|---|---|---|---|
| Model | N | R | R Square |
| 1 | 1830 | .501[a] | 0.251 |
| 2 | 1830 | .802[b] | 0.644 |

[a]Predictors: (Constant), % low participation neighbourhood
[b]Predictors: (Constant), % low participation neighbourhood, school attainment level

**Table 8.** The relationship between the percentage of students in low participation neighbourhoods and progression rates to high-tariff universities (coefficients).

| Coefficients | | | | |
|---|---|---|---|---|
| Model | | Unstandardised coefficients | | Standardised coefficients |
| | | B | Std. Error | Beta |
| 1 | Constant | 32.402 | 0.510 | |
| | % low participation neighbourhood | −0.264 | 0.011 | −0.501 |
| 2 | Constant | −2.787 | 0.859 | |
| | % low participation neighbourhood | −0.129 | 0.008 | −0.244 |
| | School attainment level | 5.454 | 0.121 | 0.677 |

The LPN analysis was repeated with the school progression rate to competitive universities set as the dependent variable. Tables 7 and 8 show the results.

The overall association between the proportion of LPN pupils in the school and progression rates to degree study is relatively similar irrespective of whether all degree courses are considered or whether only progression to competitive universities is considered. Each 1% increase in proportion of LPN pupils is associated with a 0.26% decrease in school progression rates to selective universities (compared to 0.25% for all universities). As before, this negative association persists (though reduces) even when school-level attainment is added in to the model. With progression to competitive universities, the relative influence of attainment is greater (compared to progression to all universities) and more variation in progression rates between schools can be explained by the linear model and the majority of variance (64.4%) can be accounted for.

## *The effectiveness of schools as judged by Ofsted*

The final school level characteristic to be considered was the effectiveness of schools as determined by the outcome of Ofsted inspections. Before regression analyses were completed, some initial analysis of the data was completed in an attempt to understand the average differences of schools in the different Ofsted categories. This initial analysis is presented in Table 9.

Unsurprisingly, schools with higher Ofsted ratings tend to have higher levels of attainment than those with lower ratings (though Inadequate schools are doing slightly better than Requires improvement schools). This could be because schools with better quality provision (as observed by Ofsted) lead their pupils to better examination results though it is also the case that inspectors are instructed to consider levels of attainment in schools

**Table 9.** Average characteristics of schools by Ofsted rating.

| | | N | Average school attainment level | Average % of disadvantaged pupils | Average % low participation neighbourhood | Average % progression to degrees | Average % progression to top third |
|---|---|---|---|---|---|---|---|
| Ofsted rating | Outstanding | 534 | 7.42 | 14.79 | 17.46 | 77 | 39 |
| | Good | 1100 | 4.92 | 17.99 | 35.00 | 61 | 18 |
| | Requires improvement | 320 | 3.95 | 21.75 | 53.71 | 54 | 12 |
| | Inadequate | 125 | 4.10 | 23.42 | 57.68 | 54 | 11 |

when they are forming their judgements in the first place (Office for Standards in Education, 2019). Schools in the most effective categories tend to send more of their pupils on to degree study and also more of their pupils on to the most competitive universities. This could be explained by the higher attainment levels in these schools or it could also be that more effective schools provide better quality guidance to pupils, offer pupils more encouragement or create more aspirational school cultures.

It is clear from the analysis that schools with lower Ofsted ratings have a much higher proportion of pupils residing in low participation neighbourhoods. The analysis also confirms the findings of another study by Hutchinson (2016) which found that schools in the lower Ofsted categories tend to have higher proportions of socioeconomically disadvantaged pupils. Observations such as this have led to criticism of the inspection process and the suggestion that the grading of schools can effectively amount to a grading of school intakes rather than constituting a genuine measure of school effectiveness (Allen-Kinross, 2019). Whilst a lengthy discussion of criticisms of the Ofsted inspection process is beyond the scope of this article, potential shortcomings of the inspection process should nonetheless be borne in mind in the interpretation of the analysis of Ofsted data.

The results of the first linear regression performed with the Ofsted data are presented in Tables 10 and 11.

**Table 10.** The relationship between Ofsted rating and progression rates to degree study.

| Model Summary | | | |
|---|---|---|---|
| Model | N | R | R Square |
| 1 | 2079 | .410[a] | 0.168 |
| 2 | 2079 | .660[b] | 0.436 |

[a]Predictors: (Constant), Ofsted rating
[b]Predictors: (Constant), Ofsted rating, school attainment level

**Table 11.** Relationship between Ofsted rating and progression rates to degree study (coefficients).

| Coefficients | | | | |
|---|---|---|---|---|
| Model | | Unstandardised coefficients | | Standardised coefficients |
| | | B | Std. Error | Beta |
| 1 | Constant | 82.268 | 0.978 | |
| | Ofsted rating | −9.214 | 0.450 | −0.410 |
| 2 | Constant | 43.649 | 1.471 | |
| | Ofsted rating | −2.675 | 0.425 | −0.119 |
| | School attainment level | 4.738 | 0.151 | 0.594 |

**Table 12.** The relationship between Ofsted rating and progression rates to high-tariff universities.

| Model Summary | | | |
|---|---|---|---|
| Model | N | R | R Square |
| 1 | 2079 | .504[a] | 0.254 |
| 2 | 2079 | .790[b] | 0.624 |

[a]Predictors: (Constant), Ofsted rating
[b]Predictors: (Constant), Ofsted rating, school attainment level

**Table 13.** The relationship between Ofsted rating and progression rates to high-tariff universities (coefficients).

| Coefficients | | | | |
|---|---|---|---|---|
| Model | | Unstandardised coefficients | | Standardised coefficients |
| | | B | Std. Error | Beta |
| 1 | Constant | 43.855 | 0.897 | |
| | Ofsted rating | −10.960 | 0.413 | −0.504 |
| 2 | Constant | −0.090 | 1.163 | |
| | Ofsted rating | −3.535 | 0.336 | −0.162 |
| | School attainment level | 5.393 | 0.119 | 0.698 |

16.8% of all variation in school progression rates to degree-level study can be explained by Ofsted rating alone and each single decrease in Ofsted rating (for example, a reduction from Outstanding to Good) is associated with a 9.2% reduction in school progression rates to degree-level study on average. Even when school attainment is held fixed, every reduction in school quality by one level is still associated on average with a 2.7% reduction in school progression rates to degree-level study. When Ofsted rating and school attainment are considered together, 43.6% of all variation in school-level progression to degree study can be explained by these variables, though the relative influence of attainment is roughly five times greater than that of Ofsted rating.

As with the other characteristics, the linear regression analysis was repeated but with school progression rates to high-tariff universities used as the dependent variable. Tables 12 and 13 show the results.

The picture painted here is broadly similar to that of the first analysis, though Ofsted ratings would appear to be more strongly related to progression rates to high-tariff universities than they are to progression rates to degree-level studies in general. Taken together, Ofsted rating and school-level attainment explains a majority (62.4%) of variation in school progression rates to high-tariff universities. Even when considering schools with the same level of attainment, a single reduction in an Ofsted rating is associated with a 3.5% reduction in progression rates to high-tariff universities.

## Discussion

### *Socioeconomic disadvantage*

The analysis of school data does not appear to suggest that, on average, schools with a greater proportion of socioeconomically disadvantaged pupils are held back (when it comes to HE progression) by cultures of low aspiration, lack of encouragement from

teachers or poor quality guidance. If this were the case, it would be expected that a negative association between disadvantage and HE progression would persist even once school-level attainment is controlled for. The fact that this does not happen suggests that the culture within more disadvantaged schools is no less aspirational than it is within more advantaged schools (and in fact may even, on average, be more aspirational). These results would also suggest that the small negative general association between disadvantage and school progression rates to HE is likely to be explained predominantly by differences in school-level attainment. The discovery here of a positive association between school disadvantage and school progression rates to HE once attainment is controlled for is reminiscent of the findings of other studies, for example, studies which have shown that pupils from state schools tend to perform better at university when compared to pupils from independent schools with the same level of attainment (HEFCE, 2015; Smith & Naylor, 2001). This could be because the state school pupils may officially have a level of attainment which is an underrepresentation of their true potential when compared to independent school pupils. Similarly, schools with more disadvantaged cohorts may find it more difficult to achieve a given level of attainment when compared to similar schools with more advantaged cohorts and so it may be the case that when it comes to more disadvantaged schools the average level of school attainment may be a slight underrepresentation of the true average level of potential of the pupils within the school. Another possible explanation is that schools with higher proportions of disadvantaged pupils may also have a greater proportion of pupils who benefit from contextual admissions policies which enable pupils to progress into universities with lower levels of attainment than would otherwise be expected.

Having said this, when the analysis was restricted to progression to more selective universities, the association between the proportion of socioeconomically disadvantaged pupils and HE progression remained negative both before and after attainment controls were applied. This suggests that WP outreach interventions focusing on progression to more competitive universities could have the effect of (slightly) raising school progression rates to these universities even if these interventions do not have the effect of raising school attainment.

### *Low participation neighbourhoods and Ofsted ratings*

Discussion of these two remaining school characteristics has been brought under the same heading as there is a similar trend both times. The proportion of LPN pupils in schools and (decreases in) school quality as measured by Ofsted are both negatively associated with progression rates to HE and this negative association persists even once school-level attainment is controlled for. Therefore, the lower levels of HE progression in schools with high proportions of LPN pupils and also schools with lower Ofsted ratings cannot simply be explained by lower levels of attainment in these schools. The same phenomenon is observed even if the analysis is restricted to concern only progression to more selective universities. The findings suggest that it is possible that the lower rates of progression in schools with more LPN pupils and lower Ofsted ratings could be

explained in part by other unobserved factors such as less aspirational cultures within these schools, poorer quality guidance or less encouragement from staff to attend university.

## *Implications for WP outreach*

It must be stressed that all the analysis presented in this article was completed using *school-level* data. Linear regression analyses have considered the relationship between school-level characteristics and school-level progression rates to degree-level studies. Therefore, only conclusions about schools can be drawn. No inferences about *individuals* (or groups of individuals with certain characteristics) should be made from this analysis and conclusions drawn about the effective targeting of WP outreach activities concern *school-level* targeting of these activities, not individual-level targeting of these activities.

When it comes to efforts made to increase the progression rates to degree-level study at particular schools, it would seem fairly clear that the surest way to achieve this is by increasing school-level attainment since school-level attainment is so closely associated with school-level progression rates to degree study and this association cannot be explained away by other confounding variables. However, attainment raising is not the only strategy which is typically implemented in the drive to increase rates of progression to degree-level study in schools. As noted earlier, many WP outreach activities do not have attainment raising as their goal but instead they may focus on other factors such as creating more aspirational cultures within schools, improving the quality of guidance in schools (with respect to the university application process) and urging teachers to offer their pupils more encouragement when it comes to university progression. Focusing on these non-attainment factors is more likely to be effective in schools where there are gaps in progression rates to degree-level study which cannot simply be explained away by attainment differences.

Following the analysis presented in this article, a distinction can be drawn between schools with higher proportions of socioeconomically disadvantaged pupils, on one hand, and schools with higher proportions of LPN pupils or lower Ofsted ratings on the other hand. Given that schools with higher proportions of socioeconomically disadvantaged pupils have a progression rate which appears to be held back predominantly by school attainment, these may not be the schools which benefit the most from outreach activity which does not have the effect of raising attainment. However, schools with high proportions of LPN pupils or those with lower Ofsted ratings (which on average have progression gaps which cannot be attributed entirely to attainment differences) may stand to benefit more from certain outreach interventions.

However, there is one method of school targeting yet to be discussed which is likely to be the most successful of all, which is to consider schools individually rather than making generalisations based on the average character of school cohorts. All the conclusions presented in this article apply *on average*; however, in reality every school is unique. Whilst it may be true on average that schools with lower Ofsted ratings (or those with more LPN pupils) send fewer pupils on to degree-level study than would be expected considering school attainment, there will still be some schools in these circumstances where progression to degree-level study is in fact in line with attainment and so they are less likely to be influenced by WP outreach activity. Similarly, there will

still be many individual schools in England with high levels of socioeconomically disadvantaged pupils which would benefit from WP outreach activity, even though these schools may be less likely to benefit on average. Of course, many WP outreach initiatives will have increasing the number of socioeconomically disadvantaged pupils who progress to degree study as their main aim, so in this sense of course outreach providers will want to target schools with a high proportion of disadvantaged learners. However, they should do so intelligently by targeting the particular schools where progression to degree-level study is lower than would be expected given school-level attainment as opposed to a blanket targeting of all schools in disadvantaged communities. This is not to say that some schools in disadvantaged communities should simply be ignored; however, for some schools the best focus may be on attainment raising (rather than engagement with WP outreach) and the best way to achieve this is likely to be through measures taken to improve the quality of teaching and learning at the school.

The sizeable WP outreach industry in England which has developed over time would likely benefit from being provided with school-level data which gives an indication of whether a school's progression rate to degree-level study (or perhaps also progression rate to high-tariff universities) is commensurate with the school's level of attainment or not. WP outreach initiatives which aim to drive up progression to degree-level studies without increasing attainment are best targeted at schools where a progression gap has been identified after attainment has been controlled for statistically. There can be no guarantee that a WP outreach initiative (which does not raise school attainment) will drive up a school's progression rate simply because that school serves a community with a high proportion of socioeconomically disadvantaged learners.

## Acknowledgement

The author would like to acknowledge the support of Emma Smith and Eliza Kozman.

## Disclosure statement

No potential conflict of interest was reported by the author(s).

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