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Tracking the Success of Contextual Offer Students at One Scottish Higher Education Institution

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ABSTRACT

Knowing the academic outcomes of students who received contextual offers to higher education is important in understanding whether or not Scotland's Widening Access efforts have been successful in delivering impact to those from socio-economically deprived backgrounds. This study showed that once controlling for academic cohort, sex, ethnicity and faculty, contextual offer students have a greater than 80% chance of progression at the end of first year and a greater than 60% chance of completing their Bachelor's with Honours degree within 4 years. However, for the data used in this study, contextual offer students were not as successful as their standard offer peers. Models also showed that students from more deprived areas (measured using SIMD Quintile) were less likely to be successful compared to their peers from less deprived areas, even when they had the same levels of prior attainment in secondary school exams (Scottish Higher). This study calls for Scotland's Widening Access targets to focus not only on admissions but also on improving the academic outcomes of disadvantaged students' throughout their time at university.

1 | Background

For decades, there have been stubbornly high attainment gaps from primary to the late secondary stages of British education, with gaps observed across the sexes, social classes, schools and geographical areas of deprivation (Boliver et al. 2017; Croxford 2009; Scottish Government 2018, 2022). Research from Boliver (2013) has highlighted the 'unfairness' associated with application to and acceptance into the UK's most prestigious universities for students from lower socio-economic backgrounds. Entry requirements appear to have inflated beyond what is necessary to achieve success at degree level (Boliver et al. 2017), and this inflation has been particularly exacerbated by the disruption to education during the COVID-19 pandemic (Commissioner for Fair Access 2020). Finally, there is evidence of gaps in the degree-level outcomes of those from the most and least advantaged backgrounds (Commissioner for Fair Access 2018; Croxford et al. 2014). All of this evidence leads to the conclusion that the education systems in the UK, at every stage, are not fair nor equal.

Given this situation, it is understandable why there is pressure to ensure a fairer education system for all, particularly for higher education, because degrees can improve graduates' opportunities and life earnings in the labour market (Audit Scotland 2016; Byrom and Lightfoot 2013; Universities Scotland 2023; Waltmann et al. 2020). Efforts to address these gaps in higher education come under the umbrella of Widening Access, the justifications of which are often rooted in both moral and economic arguments. For example, the Commission on Widening Access (2016), formed by the Scottish Government, stated that Widening Access is 'fundamentally about fairness'. They argued that by ignoring those from disadvantaged backgrounds, 'Scotland is missing out on the economic potential of some of our finest talents' (Commission on Widening Access 2016). Additionally,

Scotland's Commissioner for Fair Access, whose job is to lead the national strategy on Widening Access, has tied its progress to efforts that address child poverty and gaps in the labour market (Commissioner for Fair Access 2024).

In 2016, the Commission on Widening Access's (2016) recommendations and targets for Scottish educational reform were published and subsequently accepted by the Scottish Government (Scottish Government 2016a) and all of Scotland's higher education institutions (Universities Scotland 2016). A sector-wide target was set such that by 2030, 20% of entrants to higher education should come from the 20% most deprived areas in Scotland as measured by the Scottish Index of Multiple Deprivation (SIMD). Here, SIMD Quintile 1 refers to the 20% most deprived areas and SIMD Quintile 5 refers to the 20% least deprived areas (for a full definition of SIMD, see Scottish Government (2020)). Included was also the recommendation that 'contextual offers' be implemented across all Scottish higher education institutions (Commission on Widening Access 2016). This is the practice of considering a student's contextual background in addition to their prior attainment when making admission decisions. All universities use SIMD in their eligibility criteria for contextual offers, although other measures can also be considered. For example, the University of Strathclyde considers those from SIMD Quintile 1 or 2, who are care-experienced, who have caring responsibilities and those who attended a 'low-progression' school in their eligibility criteria (University of Strathclyde 2024b). The justification for contextual offers was based on evidence that success at higher education cannot be predicted based on prior attainment alone and that contextual information may also be necessary to better understand a student's 'potential' to succeed (Cameron, Wharton, and Scally 2018; Crawford 2014; Croxford et al. 2014; Hoare and Johnston 2011; Lasselle, McDougall-Bagnall, and Smith 2014).

Contextual offers are seen as a key tool in the recruitment of students from SIMD Quintile 1 geographical areas and other disadvantaged backgrounds (Commissioner for Fair Access 2024). Prior to the implementation of contextual offers, the share of SIMD Quintile 1 students in Scottish higher education institutions in 2015/16 was 14% (Commissioner for Fair Access 2017). This subsequently increased to 16.5% in 2022/23 (Commissioner for Fair Access 2024). The validity of SIMD as the primary measure of eligibility for a contextual offer has, however, been questioned due to its bias towards big cities and against rural areas (Boliver et al. 2020; Boliver, Gorard, and Siddiqui 2022; Learmonth 2023; Universities Scotland 2016). This was highlighted in 2021 when five institutions based in Glasgow (including the University of Strathclyde) achieved the 20% SIMD Quintile 1 target for 2030 ten years early, while four rural institutions had failed to meet a target of 10% (Commissioner for Fair Access 2022). The Commissioner for Fair Access (2022) warned that some institutions may have a 'free pass' in achieving national targets due to their geographical location or historical recruitment strategies. Despite these concerns, SIMD remains the primary measure of progress towards Widening Access targets in Scotland.

In Scotland, much of the emphasis on measuring progress for Widening Access has been focused on admitting disadvantaged students into higher education; less emphasis has been placed on the performance of those students once they are on-programme. There is, however, some indication that this is changing after the new Commissioner for Fair Access (2024) recommended that equal weight be given to disadvantaged students' academic outcomes. It was argued that the retention rates of target groups had seen little progress since 2016, and a commitment was made to investigate why this was the case. Indeed, there has been concern over a lack of support structures at institutions for students with lesser attainment due to their disadvantaged backgrounds who may be struggling (Boliver and Powell 2023). Having targets on the academic outcomes of disadvantaged students could prove to be sufficiently stretching for institutions that have already achieved the 2030 target.

The problem with measuring the academic outcomes of disadvantaged students is in deciding what an appropriate success rate is for such students. Ultimately, what is deemed appropriate is subjective. For example, it may seem appropriate to simply compare the success rates of contextual offer students compared to their peers. However, such a comparison may be unfair given that these students, by definition, have lower prior attainment from secondary education. Furthermore, the potential disadvantage that made these students eligible for a contextual offer may not disappear once they attend and progress through university. A more appropriate measure of their success may be to look at their chances of success, once controlling for other factors. For example, Boliver et al. (2017) argued that an 80%+ probability of progressing from first year to second year could constitute 'high-bars' of success for any student at highly selective institutions. Similarly, one of the University of Strathclyde's key performance indicators is to achieve between 90% and 95% 'retention' (progression from Year 1 to Year 2) for all students going towards 2030 (University of Strathclyde 2024a).

2 | Aims of the Analysis

This study aims to address the growing interest in postadmission academic outcomes for contextual offer students by investigating their progression and completion rates at one Scottish higher education institute (the University of Strathclyde). This was achieved through two analysis aims.

The first aim was to use risk ratios to determine contextual offer students' chances of success compared to standard offer students, once controlling for other significant factors. This gives an assessment of how well contextual offer students are faring in higher education compared to their peers.

The second aim was to determine the average predicted probability of success for contextual offer students, once controlling for other significant factors. These predicted probabilities are then compared to the progression (80%+) benchmark provided by Boliver et al. (2017) as well as the University's 2030 Key Performance Indicator of 90%–95% progression (University of Strathclyde 2024a). The predicted probability of success for standard offer students was also derived for comparison.

Taken together, both the risk ratios and predicted probabilities give a clearer picture of the academic outcomes of contextual offer students at higher education.

3 | Data

Data for these analyses came from the University of Strathclyde's Core Student Record database. Being founded in 1796 and awarded university status in 1964, the University of Strathclyde belongs to Scotland's group of 'old' universities. It is Scotland's third largest university by total population of UK students (Higher Education Statistics Agency 2024) and regularly ranks within the top 50% of UK universities (Times Higher Education 2024). As a socially progressive institution, the University has been practising contextualised admissions since 2013. It is seen as a competitive institution, with high entry requirements for Scottish students (for entry in 2018/19 the average was four subjects at grade A in Scottish Higher qualifications).

The Core Student Record database was combined with the University's prospectus data and the Scottish Government's datasets on SIMD (Scottish Government 2016b, n.d.). The data were subset to only include Scottish school-leavers who were admitted to the University between academic sessions 2015/16 and 2018/19 (four academic cohorts' worth of registration records). Data from 2015/16 were included since the University of Strathclyde had also been practising contextualised admissions for this session. Scottish school-leavers were defined to be those who were full-time, first-degree, Scottish domiciled undergraduates, who were aged 18 or under at the point of their first registration. Only students who applied via the University and Colleges Admissions Service (UCAS) were included. Students who had skipped the first year of a degree programme were removed from the data. Students with missing or unknown data in the Ethnicity and Offer Received variables were also removed from the data. The resultant dataset is referred to as the school-leavers dataset (SLD) and contains 7534 unique students. A summary of the relevant categorical variables in the SLD can be seen in Table 1.

3.1 | Categorical Explanatory Variables

'Academic Cohort' groups students who were admitted to the university in the same academic session. There are approximately equal numbers of students in each Academic Cohort (Table 1). 'Sex' and 'Ethnicity' were derived from what the student had disclosed on their UCAS application. Given the imbalance in the number of students from each ethnic group, ethnicities were combined into the White (British, Irish, Scottish, Other) and Ethnic-minority (including mixed race) categories. This was to ensure that there were enough observations in each group such that this variable could be included in statistical models. There is an approximate 50:50 split between males and females in the dataset (Table 1). Students can change degree programme and/or faculty while registered at the university. To prevent the models becoming overly complicated to interpret, each student's 'Faculty' was fixed at the one they registered with when admitted to the university. There are four faculties at the University of Strathclyde, denoted here as faculties A, B, C and D. The SIMD versions 2012 (Scottish Government n.d.) and 2016 (Scottish Government 2016b) were linked to the data using the student's postcode and Academic Cohort. The SIMD 2012 indicator was used for students from Academic Cohorts 2015/16 and 2016/17, while the SIMD 2016

TABLE 1 | Summary of the categorical variables in the school-leavers dataset.

Variables	Levels	Count	Proportion
Academic Cohort	2015/16	1940	0.257
	2016/17	1943	0.258
	2017/18	1869	0.248
	2018/19	1782	0.237
Completion (outcome variable)	No	1859	0.247
	Yes	5675	0.753
Ethnicity	Ethnic-minority	543	0.072
	White	6991	0.928
Faculty	A	1452	0.193
	B	2086	0.277
	C	2310	0.307
	D	1686	0.224
Offer Received	Con. Offer	1049	0.139
	Std. Offer	6485	0.861
Progression (outcome variable)	No	790	0.105
	Yes	6744	0.895
SIMD Quintile	1	817	0.108
	2	1116	0.148
	3	1209	0.16
	4	1598	0.212
	5	2794	0.371
Sex	Female	3798	0.504
	Male	3736	0.496
Total	—	**7534**	**1.00**

indicator was used for the 2017/18 and 2018/19 cohorts. It was assumed that these were the versions of SIMD that were in use when the student's UCAS application was processed.

3.2 | Defining the Progression and Completion Outcomes

There were two binary academic outcomes of interest: progression at the end of the first registration year (Progression) and completion of a Bachelor's with Honours degree within 4 years (Completion).

Students were considered to have successfully progressed if they advanced one academic stage after their first year of registration. Students who failed to progress may have been withdrawn, may have been in suspension (for academic or personal reasons) or may have repeated a stage of their programme. Around 89.5% of students in the SLD successfully progressed at the end of first year (Table 1).

Bachelor's with Honours degrees are typically 4-year duration in Scotland. Thus, students were considered to have successfully completed their degree if they had achieved a: first-class, second-class or third-class honours degree, or had passed the fourth stage of their Integrated Master's programme, within four registration years (regardless of whether they changed degree programme). Integrated Master's students were included in the analysis because (i) they could not be distinguished from Bachelor's with Honours students, and (ii) various programmes which offered these pathways were identical up to the final Masters year. Failure to complete a degree included anyone who exited the university at any stage with none of the aforementioned classifications or took longer than 4 years to complete their degree. Roughly 75.3% of students in the SLD successfully completed their degree within 4 years (Table 1).

3.3 | Defining Prior Attainment Points

In their senior years of secondary school (S5 and S6), Scottish students can undertake two levels of qualification in individual subjects, Highers and Advanced Highers. Typically, students study five subjects at Higher in S5, followed by another five subjects at Higher in S6. Advanced Highers are typically offered to S6 students who wish to study a subject in greater depth; however, they are not required for entry to most degree programmes in Scotland.

In Scotland, young people normally apply to higher education in their final year of secondary school, which is typically S6. At the end of their previous year, S5, they will have already received the results of their first sitting of Highers and, because entry requirements are usually based on Highers, unconditional offers are common. Those that apply in S5 (without Higher results) will be processed in a similar way to those from the rest of the UK for whom conditional offers are the norm and are often based on predicted grades; young people can leave school after S5 or S6 provided they are 16 years of age.

This means that offers given by institutions to Scottish applicants are primarily based upon attainment in S5 at Higher. This is reflected in the entry requirements to the University of Strathclyde, which typically cite only 4–5 grades at Higher. Thus, to mimic real-world practice, each student's prior attainment from secondary school was summarised as the total

'score' they had achieved in their five best Highers in S5, prior to when they applied to the university. This was defined as the student's 'Prior Attainment Points'. A simple scoring system was used such that the grades: A—3 points, B—2 points, C—1 point. This was considered easier to interpret than, for example, the UCAS tariff points system (A—33 points, B—27 points, C—21 points for Highers) in which many UK and international qualifications are compared, and therefore, the definition of a single tariff point is not clear. In our system, a single point increase corresponds to an increase in grade, for example, a C to a B, or a B to an A. The Prior Attainment Points can, therefore, be interpreted as the student's academic potential as measured by their academic performance at Higher in S5, the qualifications of relevance to our population. The median Prior Attainment Points total across the SLD is 12.00 points, which is the equivalent of four Higher A grades. The median Prior Attainment Points total for standard offer students is 12.00 points and for contextual offer students is 9.00 points.

3.4 | Identifying Contextual Offer Students

For a student to have received a contextual offer, they must first have been eligible, and then they must have met their programme's 'minimum entry requirements' (MERs) at the point of admission (after S5 or S6); standard offer applicants must have met the 'standard entry requirements' (SERs). The difference between SERs and MERs is typically one or two grades at Higher. As outlined previously, the University of Strathclyde deems those eligible for a contextual offer as: applicants from SIMD Quintile 1 or 2, applicants with care experience or caring responsibilities and applicants who attended a low-progression school (University of Strathclyde 2024b).

In the SLD, the offer a student received is not recorded. In addition, only the student's SIMD Quintile is available; no other eligibility criteria are known. Thus, a proxy indicator (Offer Received) was required to identify students who likely received a contextual offer. This was defined such that students in the SLD from SIMD Quintiles 1 or 2 who had achieved below the SERs at the time of application, were classified as 'contextual offer' students and the remaining students were classified as 'standard offer' students. There were 1049 contextual offer students (13.9%) classified in the SLD (Table 1, and the shaded cells of Table 2).

TABLE 2 | Summary of students' SIMD Quintile versus whether or not they met the standard entry requirements at the point of application.

| SIMD quintile | Met standard entry requirements at application? | | Sum (Prop.) |
	Equal to or above	Below	
1	346 (0.05)	*471 (0.06)*	817 (0.11)
2	538 (0.07)	*578 (0.08)*	1116 (0.15)
3	813 (0.11)	396 (0.05)	1209 (0.16)
4	1200 (0.16)	398 (0.05)	1598 (0.21)
5	2158 (0.28)	636 (0.08)	2794 (0.37)
Sum (Prop.)	5055 (0.67)	2479 (0.33)	7534 (1.00)

Note: Contextual offer students (highlighted) were those who attained below the standard entry requirements and were from SIMD Quintiles 1 and 2. Proportions rounded to two decimal places.

To determine whether a student had met the SERs or not, the SERs were converted into simple points, similar to Prior Attainment Points. The difference was then taken between each student's Prior Attainment Points and SERs for the degree programme they applied for. The majority of students from SIMD Quintiles 1 and 2 had achieved below the SERs at the point of application (Table 2) while the majority of those from SIMD Quintiles 3–5 met or exceeded the SERs.

4 | Methodology

Given that both the Progression and Completion variables are binary outcomes, regression techniques from the family of generalised linear models (GLMs) were used for analysis. The three most common methods are logistic regression, modified Poisson regression and log-binomial regression. Logistic regression was considered, but ultimately ruled out due to its derivation of odds ratios, which are frequently misinterpreted as risk ratios (Altman, Deeks, and Sackett 1998; Chu et al. 2021; Davies, Crombie, and Tavakoli 1998; Martinez et al. 2017; Norton and Dowd 2018; Norton, Dowd, and Maciejewski 2018; Tajeu et al. 2012). Use of odds ratios is only appropriate when the prevalence of the outcome of interest is less than 10% (Davies, Crombie, and Tavakoli 1998; Martinez et al. 2017), which is not the case for the progression and completion outcomes in the SLD. Additionally, the error terms for logistic regression are sensitive to changes in model specification (Norton and Dowd 2018). Log-binomial regression models were attempted, but failed to converge when Prior Attainment Points were included in the model specification. Failed convergence can be a common problem in log-binomial fits (Williamson, Eliasziw, and Fick 2013).

This left the Poisson regression model. Normally used to model count data, Poisson regression can appropriately model binary outcomes when it is modified such that the error terms are calculated using 'sandwich estimation' (Zeileis 2006). Such error terms are also known as robust standard errors. Once exponentiated, the coefficients from Poisson regression models can be interpreted as approximate estimates of risk ratios. Risk ratios (RR) can be expressed as

$$RR = \frac{P(Y = 1 | X = 1)}{P(Y = 1 | X = 0)} = \frac{\pi_1}{\pi_0}$$

where π_1 is the probability of experiencing the outcome for those who are exposed to the outcome, $X = 1$, over the probability π_0 of experiencing the outcome for those who were not exposed to the outcome, $X = 0$. For example, if the risk ratio for females successfully progressing versus males successfully progressing was 1.5, then it can be said that females were 50% more likely to progress compared to males. If the same risk ratio was instead 0.75, then it can be said that females were 25% less likely to progress compared to males.

Two modified Poisson regression models were fit to the data and denoted Models 1a and 1b, where 'a' represented the model for the progression outcome, and 'b' for the completion outcome. Models 1a and 1b were used to determine the adjusted risk ratio of progression/completion for contextual versus standard offer students, whilst controlling for academic cohort, faculty, sex and ethnicity which are also common control variables in the literature (Hoare and Johnston 2011; Lasselle, McDougall-Bagnall, and Smith 2014).

This was followed by two additional modified Poisson regression models, denoted Models 2a and 2b, which had the same model specification as before but replaced Offer Received with Prior Attainment Points and a new variable—'SIMD group'. SIMD group was a binary stratification of SIMD Quintile which grouped together SIMD Quintiles 1 and 2 and SIMD Quintiles 3–5. Models 2a and 2b were used to determine whether or not the adjusted risk ratio of progression/completion for Prior Attainment Points and SIMD group were comparable to the estimates of Offer Received in Models 1a and 1b.

The average-adjusted probabilities of success for standard and contextual offer students were calculated from Models 1a and 1b. This was found by predicting each student's probability of progression/completion, once controlling for other variables in the model fits, and then taking the mean within each group. The average adjusted probabilities for students in each SIMD group were also calculated from Models 2a and 2b. The 95% confidence intervals for each of these were constructed using the robust standard errors derived from the modified Poisson regression fits.

For each fit, the reference groups for the categorical explanatory variables were: Academic Cohort—2015/16, Ethnicity—white, Faculty—D, Offer Received—standard offer, Sex—male, SIMD group—Quintiles 3–5. Prior Attainment Points were mean-centred in the model fits. The p-values from Wald's tests on each coefficient were derived using $\alpha = 0.05$ as the critical value. Since the data are cross-sectional, the significant associations that are highlighted should not be interpreted as causal. All analyses were conducted using the statistical software **R (version 4.3.1)** (R Core Team 2023). Poisson regression models were fit using the **glm()** function from the **stats** package (R Core Team 2023). Robust variances for the modified Poisson Regression model were derived using the **sandwich (3.1–0)** package (Zeileis 2006). Average adjusted probabilities were derived using the **avg_predictions()** function within the **marginaleffects (0.23.0)** package (Arel-Bundock, Greifer, and Heiss 2024). Additional packages for general data cleaning and visualisations were used from the **tidyverse (2.0.0)** (Wickham et al. 2019).

5 | Results

5.1 | Risk Ratios for Standard and Contextual Offer Students

The derived risk ratios from Models 1a (Table 3) showed the adjusted risk ratios for Offer Received and other control variables, with respect to the progression outcome. Contextual offer students were 8.3% [95% CI: 5.6%, 10.9%] less likely to progress compared to standard offer students. Students from Faculty C were 4.9% [95% CI: 2.6%, 7.1%] less likely to progress compared to students from Faculty D. Students from Faculties A and B did not appear to be more or less likely to progress compared to students from Faculty D. Students from Academic Cohort 2018/19 were 2.4% [95% CI: 0.2%, 4.5%] less likely to progress compared

TABLE 3 | Modified Poisson model 1a—Measuring the adjusted risk ratio of Offer Received on progression.

Variables	p	Coefficients (Robust S.E.)	Adjusted risk ratios (95% C.I.)
(Intercept)	NA	−0.082 (0.010)	0.921 (0.904, 0.938)
Contextual Offer (vs. Std.)	< 0.001	−0.086 (0.015)	0.917 (0.891, 0.944)
Faculty A (vs. D)	0.207	0.013 (0.011)	1.013 (0.993, 1.035)
Faculty B (vs. D)	0.202	−0.014 (0.011)	0.986 (0.965, 1.008)
Faculty C (vs. D)	< 0.001	−0.050 (0.012)	0.951 (0.929, 0.974)
2016/17 Cohort (vs. 2015/16)	0.419	−0.009 (0.011)	0.991 (0.971, 1.012)
2017/18 Cohort (vs. 2015/16)	0.856	−0.002 (0.011)	0.998 (0.977, 1.019)
2018/19 Cohort (vs. 2015/16)	0.036	−0.024 (0.011)	0.976 (0.955, 0.998)
Female (vs. Male)	0.432	0.007 (0.009)	1.007 (0.990, 1.024)
Ethnic minority (vs. White)	0.543	0.009 (0.015)	1.009 (0.980, 1.040)

TABLE 4 | Modified Poisson model 1b—Measuring the adjusted risk ratio of Offer Received and other control variables on completion.

Variables	p	Coefficients (Robust S.E.)	Adjusted risk ratios (95% C.I.)
(Intercept)	NA	−0.269 (0.017)	0.764 (0.739, 0.789)
Contextual Offer (vs. Std.)	< 0.001	−0.206 (0.025)	0.814 (0.775, 0.855)
Faculty A (vs. D)	0.002	0.053 (0.017)	1.054 (1.019, 1.090)
Faculty B (vs. D)	0.008	−0.049 (0.019)	0.952 (0.918, 0.987)
Faculty C (vs. D)	< 0.001	−0.161 (0.021)	0.852 (0.817, 0.887)
2016/17 Cohort (vs. 2015/16)	0.347	0.017 (0.018)	1.017 (0.981, 1.055)
2017/18 Cohort (vs. 2015/16)	0.078	0.032 (0.018)	1.033 (0.996, 1.070)
2018/19 Cohort (vs. 2015/16)	0.164	0.026 (0.019)	1.026 (0.989, 1.065)
Female (vs. Male)	< 0.001	0.058 (0.014)	1.060 (1.031, 1.090)
Ethnic minority (vs. White)	0.410	0.021 (0.026)	1.021 (0.971, 1.074)

to students from the 2015/16 cohort. Males and females did not appear to have different rates of progression compared to one another, and similarly between whites and ethnic minorities.

The derived risk ratios from Models 1b (Table 4) showed similar adjusted risk ratios but with respect to the completion outcome. Contextual offer students were 18.6% [95% CI: 14.5%, 22.5%] less likely to complete their degree compared to standard offer students. Students from Faculty A were 5.4% [95% CI: 1.9%, 9.0%] more likely to complete their degree compared to students from Faculty D. In contrast, students from Faculties B and C were 4.8% [95% CI: 1.3%, 8.2%] and 14.8% [95% CI: 11.3%, 18.3%] less likely to complete their degree compared to students from Faculty D. Females were 6.0% [95% CI: 3.1%, 9.0%] more likely to complete their degree compared to males. There did not appear to be different rates of completion between each of the Academic Cohorts when compared to the 2015/16 cohort. Similarly, there did not appear to be any differences in completion rates between whites and ethnic minorities.

5.2 | Risk Ratios for SIMD Quintile

The derived risk ratios from Models 2a (Table 5) showed the adjusted risk ratios for Prior Attainment Points and SIMD group, as well as other control variables, with respect to the progression outcome. For each additional point increase over the mean Prior Attainment Points, a student was 0.9% [95% CI: 0.6%, 1.2%] more likely to progress at the end of first year

(Table 5). This meant that for each additional A grade a student achieved at Higher in S5, they were 2.7% more likely to progress. Students from SIMD Quintiles 1 and 2 were 5.2% [95% CI: 3.1%, 7.1%] less likely to progress compared to students from SIMD Quintiles 3–5. Students from Faculty C were 3.0% [95% CI: 0.5%, 5.3%] less likely to progress compared to students from Faculty D. Students from Faculties A and B did not appear to be more or less likely to progress compared to students from Faculty D. Students from Academic Cohort 2018/19 were 2.8% [95% CI: 0.6%, 5.0%] less likely to progress compared to students from the 2015/16 cohort. Males and females did not appear to have different rates of progression compared to one another, and similarly between whites and ethnic minorities.

The derived risk ratios from Models 2b (Table 6) showed similar adjusted risk ratios but with respect to the completion outcome. For each additional point increase over the mean Prior Attainment Points, a student was 2.6% [95% CI: 2.0%, 3.2%] more likely to complete their degree within 4 years (Table 6). This meant that for each additional A grade a student achieved at Higher in S5, they were 7.8% more likely to complete their degree. Students from SIMD Quintiles 1 and 2 were 9.5% [95% CI: 6.3%, 12.6%] less likely to progress compared to students from SIMD Quintiles 3–5. Students from Faculty A were 6.5% [95% CI: 3.0%, 10.2%] more likely to complete their degree compared to students from Faculty D. In contrast, students from Faculty C were 10.0% [95% CI: 6.0%, 13.8%] less likely to complete their degree compared to students from Faculty D. Students from Faculty B did not appear to be more or less likely to complete

TABLE 5 | Modified Poisson model 2a—Measuring the adjusted risk ratio of SIMD group, Prior Attainment Points and other control variables on progression.

Variables	p	Coefficients (Robust S.E.)	Adjusted risk ratios (95% C.I.)
(Intercept)	NA	−0.088 (0.010)	0.916 (0.898, 0.934)
Prior Attainment Points	<0.001	0.009 (0.002)	1.009 (1.006, 1.012)
SIMD Quintiles 1–2 (vs. 3–5)	<0.001	−0.053 (0.011)	0.948 (0.929, 0.969)
Faculty A (vs. D)	0.121	0.016 (0.011)	1.017 (0.996, 1.038)
Faculty B (vs. D)	0.726	−0.004 (0.012)	0.996 (0.973, 1.019)
Faculty C (vs. D)	0.018	−0.030 (0.013)	0.970 (0.947, 0.995)
2016/17 Cohort (vs. 2015/16)	0.269	−0.012 (0.011)	0.988 (0.968, 1.009)
2017/18 Cohort (vs. 2015/16)	0.630	−0.005 (0.011)	0.995 (0.974, 1.016)
2018/19 Cohort (vs. 2015/16)	0.012	−0.029 (0.011)	0.972 (0.950, 0.994)
Female (vs. Male)	0.343	0.008 (0.009)	1.008 (0.991, 1.025)
Ethnic-minority (vs. White)	0.190	0.020 (0.015)	1.020 (0.990, 1.051)

TABLE 6 | Modified Poisson model 2b—Measuring the adjusted risk ratio of SIMD group, Prior Attainment Points and other control variables on completion.

Variables	p	Coefficients (Robust S.E.)	Adjusted risk ratios (95% C.I.)
(Intercept)	NA	−0.292 (0.017)	0.747 (0.722, 0.773)
Prior Attainment Points	<0.001	0.026 (0.003)	1.026 (1.020, 1.032)
SIMD Quintiles 1–2 (vs. 3–5)	<0.001	−0.100 (0.018)	0.905 (0.874, 0.937)
Faculty A (vs. D)	<0.001	0.063 (0.017)	1.065 (1.030, 1.102)
Faculty B (vs. D)	0.350	−0.018 (0.019)	0.982 (0.946, 1.020)
Faculty C (vs. D)	<0.001	−0.105 (0.022)	0.900 (0.862, 0.940)
2016/17 Cohort (vs. 2015/16)	0.680	0.008 (0.018)	1.008 (0.972, 1.044)
2017/18 Cohort (vs. 2015/16)	0.245	0.021 (0.018)	1.021 (0.986, 1.059)
2018/19 Cohort (vs. 2015/16)	0.572	0.011 (0.019)	1.011 (0.974, 1.049)
Female (vs. Male)	<0.001	0.060 (0.014)	1.062 (1.032, 1.092)
Ethnic-minority (vs. White)	0.069	0.047 (0.026)	1.048 (0.996, 1.102)

their degree compared to Faculty D. Females were 6.2% [95% CI: 3.2%, 9.2%] more likely to complete their degree compared to males. There did not appear to be different rates of completion between each of the Academic Cohorts when compared to the 2015/16 cohort. Similarly, there did not appear to be any differences in completion rates between whites and ethnic minorities.

5.3 | Average Adjusted Probability of Success Within Each Group

Using each modified Poisson regression fit, the average adjusted probability of progression/completion for standard and contextual offer students (Models 1a and 1b), as well as for each SIMD Quintile (Models 2a and 2b), were calculated.

Models 1a and 1b showed that once controlling for academic cohort, sex and ethnicity, contextual offer students had an 82.7% [95% CI: 80.4%, 84.9%] chance of progression and a 62.2% [95% CI: 59.3%, 65.2%] chance of completion. Meanwhile, standard offer students had a 90.6% [95% CI: 89.9%, 91.3%] chance of progression and a 77.4% [95% CI: 76.4%, 78.4%] chance of completion. This is equivalent to a gap between standard and contextual offer students of 7.9 percentage points for progression and 15.2 percentage points for completion.

Similarly, Models 2a and 2b showed that once controlling for academic cohort, sex, ethnicity and Prior Attainment Points, those from SIMD Quintiles 1–2 had an 84.8% [95% CI: 83.2%, 86.4%] chance of progression and a 67.3% [95% CI: 65.2%, 69.3%] chance of completion. This contrasted with those from SIMD Quintiles 3–5 who had a 91.1% [95% CI: 90.4%, 91.9%] chance of progression and a 78.1% [95% CI: 77.0%, 79.2%] chance of completion. This constituted a gap between SIMD Quintiles 1 and 5 of 6.3 percentage points for progression and 10.8. percentage points for completion.

6 | Discussion

6.1 | Addressing the Aims of the Analysis

The aims of this analysis were twofold: (i) to determine contextual offer students' controlled chances of success compared to standard offer students, and (ii) to determine the average adjusted probability of success for contextual offer students. Based on the modelled definitions of success, deprivation, prior attainment and the offers received, contextual offer students were less likely to be successful at university compared to their standard offer peers. Contextual offer students' predicted chances of progression exceeded the 'high-bar' of 80%+ argued for by Boliver et al. (2017). These chances are, however, lower than the University of Strathclyde's benchmark of 90%–95% progression for all students. Most contextual offer

students were predicted to successfully complete their degree (around 62.2%), though there exists no benchmark for comparison.

The models also identified a gap in the progression and completion rates of those from SIMD Quintiles 1–2 versus Quintiles 3–5, even when they have the same levels of prior attainment at Higher in S5. These findings highlight that while the University has commendably achieved its Widening Access target on the equal representation of entrants from lower SIMD Quintiles (Commissioner for Fair Access 2022), achieving outcome equality for these students is still in progress. Models also suggested that prior attainment from S5 was more strongly associated with completion than progression. This appears to be reflected in the gap between the adjusted predicted probabilities of standard and contextual offer students, which is higher for the completion outcome than the progression outcome.

6.2 | Implications on Widening Access

These results could be used to argue either for or against Widening Access interventions. To expect contextual offer students to achieve at a level similar to their standard offer peers at university is perhaps unrealistic. This is because, by definition, contextual offer students are very likely to have lower prior attainment when they commence their degree and come from areas with higher levels of deprivation (as defined by SIMD), both of which are negatively associated with a successful outcome in our models. Furthermore, the disadvantage that makes a student eligible for a contextual offer may not completely disappear once the student starts university; it may persist until they graduate and join the workforce. For example, the experiences of Widening Access students at an elite Scottish university suggest that they are more likely to take on full-time or part-time jobs to support themselves and/or family members, do not always have the same levels of support at home, and can struggle with a sense of belonging at university and amongst their peers (Friend 2021). Given such circumstances and the fact that, at this university, greater than 80% of first-year contextual offer students' progress to second year, and greater than 60% complete their degree within 4 years, their achievements are perhaps understated.

The policy of contextual offers and Widening Access targets have had a positive impact on students who may not have otherwise had the opportunity to attend higher education. Yet, if the aim of Widening Access is to progress towards equality of outcome (Commissioner for Fair Access 2024), then universities may need to take a more active role in supporting students admitted via these policies. Setting targets for the proportion of Widening Access students who successfully complete a degree programme, in addition to those currently set on access to higher education and progression past first year for all students, could help with this. Such targets may cultivate more trust from the public that Widening Access policies are providing measurable impact.

6.3 | Modelling Limitations and Future Analyses

Rather than using UCAS tariff points to measure prior attainment, a single-point-based system was adopted, based on attainment from Higher in S5. This was done to improve the interpretability of model fits and because the analysis only considered Scottish school-leavers. Those not from SIMD Quintiles 1 or 2 but satisfying the other criteria for a contextual offer will not be correctly classified as standard offer students in this analysis. If such students have higher/lower rates of progression or completion, then they will bias the results such that the gap between standard and contextual offer students may appear larger/smaller than the true gap. Without access to data on the other eligibility criteria, the true rate of correct classification is unknown. However, anecdotal evidence from the University's Widening Access Team suggests that the majority of students who receive a contextual offer come from SIMD Quintiles 1 or 2, and that there is significant overlap between those from SIMD Quintiles 1 and 2 and the other eligibility criteria. Thus, there is confidence that most students will be correctly classified as either standard or contextual offer. The analysis presented here could be improved with direct access to applicant data. This would remove the need for the proxy indicator.

The outcomes modelled by the fitted regression models were based on defined time periods; progression was measured at the end of 1 year and completion at the end of 4 years. Some students may have had periods of suspension or may have repeated one or more years and thus results may underestimate final success rates. If these behaviours are more prevalent for contextual offer students, then the observed gaps in outcomes may be less pronounced. The effect sizes of some control variables also differed between the models for progression when compared to the models for completion. While some overlap is expected since those who failed to be retained were also counted as failing to complete their degree, it may also be the case that some factors are more associated with one outcome versus the other. These discussion points could be addressed in future analyses by fitting time-to-event models that instead track if and when a student drops out of university (Arulampalam, Naylor, and Smith 2004).

Students from Academic Cohorts 2016/17–18/19 were affected at some point in their registration by the COVID-19 pandemic which began in March 2020. Any potential effects from the pandemic should be controlled for in the model fits via the Academic Cohort variable. It would be of interest for future analyses to compare the academic outcomes of students pre- and postpandemic.

Data on the university-level attainment of students was not available for this study. Individual module attainment is a key factor in the overall academic success rates. It would also distinguish between those who do not progress/complete for personal versus academic reasons. Comparing attainment between contextual and standard offer students could, thus, provide further insight into the reasons for the gaps between the two groups of students.

The results presented here are for a single Scottish university and are not necessarily representative of other universities across Scotland or the rest of the UK. The analysis does not consider students registered with Widening Access specific programmes, only standard or contextual offer students on traditional degree programmes. The data are also cross-sectional and so the associations highlighted should not be interpreted as causal. Future analyses could endeavour to combine results across universities to give a more holistic view of the success rates of contextual offer

students across the country. Of particular interest would be an examination of the four other Glasgow institutions that have already achieved current Widening Access targets (Commissioner for Fair Access 2022).

7 | Conclusion

The results presented in this paper add to the evidence on the associations between area-level deprivation and prior attainment from secondary education with higher education outcomes. The work also estimates, for one university, the size of the attainment gap between standard and contextual offer students. The analysis is, to the best of our knowledge, the first Scottish study to do so using data from the post-Commission on Widening Access (2016) period. Widening Access policies have resulted in commendable progress on admission rates for disadvantaged students into higher education. Going forward, it is important that these policies should focus not only on admissions but also on provision of support and targets focused on the academic outcomes of students admitted via these policies. This may cultivate more trust from the public that Widening Access policies are providing measurable impact.

Author Contributions

Nathan Patrick Burns: writing – original draft, conceptualization, data curation, formal analysis, investigation, software, methodology, validation, visualization, writing – review and editing. **David Young:** supervision, conceptualization, formal analysis, investigation, methodology, project administration, writing – review and editing, writing – original draft. **Andrea Sherriff:** supervision, conceptualization, methodology, writing – review and editing. **Peter Black:** writing – review and editing, data curation, investigation, validation, visualization. **Al Blackshaw:** writing – review and editing. **Louise Kelly:** supervision, writing – review and editing, writing – original draft, conceptualization, formal analysis, methodology, project administration.

Ethics Statement

The authors have nothing to report.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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