Social Mobility through Higher Education: Exploratory Analysis of Ethno-Racial, Gender and Class Intersection in Professional Undergraduate Programmes

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ABSTARCT

Higher education and elite professional occupations are considered to be key sources of social mobility. In this paper we suggest that examining patterns of admission into professional undergraduate programmes, a key route for entry into elite professional occupations, may provide important insights into social mobility through higher education. We analyse university admission offer data and assess the impact of ethno-racial, gender and class intersection on relative likelihood of student admission to six elite professional programmes (medicine, law, accounting, architecture, engineering and business management), in comparison to non-professional programmes. Our exploratory analysis provides several interesting results; though they present a generally pessimistic picture of potential social mobility through higher education. We find that higher class background is a key factor in admissions to elite professional programmes, especially evident in the exemplar traditional professions of medicine and law; presumed gender effects on entry into technical math based professional programmes, such as engineering and accounting, are substantially moderated by class background; and ethno-racial background may mitigate some of the class penalties for women, but leads to double penalty for black men. Our findings contribute directly to the current research on impact of class origin on social mobility, especially that on class ceiling. Further, we respond to recent calls for fuller inclusion of class in intersectionality based research by showing how class may work both through and against other social factors, such as race and gender.

KEYWORDS

1. Social mobility
2. Intersectionality
3. Race, Gender and Class
4. Class Ceiling
5. Higher Education
6. Professions and Occupations

INTRODUCTION

The recent decades have been marked by extensive media and political interest in the status of social mobility in Britain (Payne 2017), especially with reference to higher education and elite professional occupations. The former is a key component of the OED triangle (Bukodi & Goldthorpe 2016), while the latter has historically been considered the 'engine' of expanding career opportunities and achieving socio-economic mobility (Milburn 2009: 5). This policy interest has led to substantial expansion of higher education, increase in access for those from underprivileged backgrounds (Brown, Reay & Vincent 2013) and monitoring of inequities in higher education (Milburn 2012a) and elite professional occupations (Milburn 2009 & 2012b).

But, despite widening access, gender, ethno-racial and class based inequities have tended to persist in prestigious Russell Group universities and in specific high earning potential subjects, mostly professional programmes, such as medicine and law (Dilnot & Boliver 2018; Steven et al. 2016; Shiner & Noden, 2015; Noden, Shiner & Modood 2014; Boliver 2013), resulting in a "steeply hierarchical and stratified system" (Reay 2016: 131). Similarly, recent research has also highlighted various inequities in elite professional occupations, for example, the negative impact of race and gender on career progression (Tomlinson et al. 2018), class origin penalty in pay or class-ceiling (Laurison & Friedman 2016; Friedman, Laurison & Miles 2015), and influence of class based cultural capital on entry into and growth within professional services (Ashley & Empson 2013, 2017; Ashley et al. 2015).

However, despite the rich variety of research on ethno-racial, gender and class based inequities in both higher education and elite professional occupations, our current understanding of barriers to social mobility still suffers from three key limitations. First, social mobility relevant research in higher education and professional occupations has tended

to focus on university entry and labour market or professional organizations data, respectively. Less attention has been paid to ethno-racial, gender and class based inequities in professional degree programmes, even though access to elite professional occupation careers and higher education are fundamentally linked, as specialised professional degree programmes, such as those in medicine, law and engineering, provide the key pathway for entering these specialised professional occupations. Second, despite its apparent relevance to social mobility, holistic studies of ethno-racial, gender and class intersectionality (Acker 2006) in professional degree programmes are mostly lacking. Even when such intersectionality is considered, there is an emphasis on race and gender intersection, while class, particularly parental occupation, is typically not included (Tomlinson et al. 2018; Hurst 2019). Third, most of the recent research has tended to focus on elite traditional professions, especially medicine and law, while comparatively less attention has been paid to bigger professional occupations, such as engineering, technology and business management. This is problematic as recent labour market data shows that administration, finance and business, and engineering and technology are the biggest sources of professional services jobs in the UK (Office of National Statistics 2017).

In order to address these issues, in this paper we examine recent university undergraduate admissions offer data to analyse how the intersectionality of ethnicity-race, gender and class (e.g. white women from lower class background) affects relative likelihood of admission into six elite professional undergraduate programmes – medicine & dentistry, law, accounting, architecture, engineering and business management - in comparison to entry into non-professional programmes (predominantly, social sciences, humanities and sciences). Our approach is different from examining absolute rates of admission, which is highly sensitive to the denominator, or calculating likelihood of admission with reference to the most privileged group (e.g. white men from higher class background), which represents one

way of assessing social mobility, albeit, an important one. Overall, our analysis directly complements existing research on social mobility in higher education and professional occupations literatures (e.g. Dilnot & Boliver 2018; Boliver 2017 & 2013; Davies et al. 2013; Laurisson & Friedman 2016) and directly responds to recent calls for holistic studies that "pay attention to the ways race, gender, and class intersect" (Hurst 2019: 1; Tomlinson et al. 2018).

THEORETCIAL BACKGROUND

Social mobility, higher education and elite professional occupations

Social mobility relevant research in higher education, especially policy papers and think tank reports, focus predominantly on both aggregate and temporally relative rates of entry of women, ethno-racial minorities and working class into universities, as it "enables them to enter high status jobs and increase earnings" (Milburn 2012a: 13). Driven by the massive expansion of higher education late 1990s onwards, absolute enrolment of traditionally underprivileged groups has increased substantially. However, many race, gender and class based inequities have doggedly persisted in prestigious Russell Group and old Red Brick universities in UK (Boliver 2017; Reay 2016; Reay et al. 2001), especially in prestigious professional programmes, such as, medicine and law.

For instance, recent research has shown that non-selective state school applicants to medical and law programmes are less likely to receive admission offers in comparison to applicants from private schools, despite the same A-level subject attainment profile (Dilnot & Boliver, 2018); applicants from deprived postcodes and with parents from lower SES occupational groups (NS-SEC 4-5) and attending non-selective state schools were both less likely to apply or obtain an offer of admission in medical programmes (Steven et al. 2016); in law programmes, accepted applicants from the less advantaged group were more likely to have better grade profile than their more advantaged peers, suggesting higher grade

requirements in order to gain admission (Bridge Group, 2020); and just 21% of all engineering and technology programme entrants were women, whereas they accounted for more than half (57%) of the student population overall (Engineering UK 2020). Thus, not just students from underprivileged backgrounds tend to be under-represented in higher education vis-á-vis the national population, their rates of under-representation become particularly exacerbated in both prestigious Russell Group and elite professional degree programmes, substantially "steepening the observed social gradient" (Steven et al. 2016: 1).

In parallel, sociological studies of social mobility have looked extensively at various barriers to intergenerational mobility in elite professional occupations. Research shows that women and ethno-racial minorities tend to be preponderant in lower status semi-professional roles (e.g. nursing), low status specializations (e.g. accident and injury law and family law) and marginal organizational forms (e.g. high street law firms) (Tomlison et al. 2018; Byars-Winston, Fouad & Wen 2015). Further, they also suffer from recruitment bias, pay gap and glass ceiling (Gorman and Kmec 2009; Brynin and Guveli 2012; Cohen, Huffman, and Knauer 2009). For example, in a study of career progression to partnership in solicitor law firms, Tomlinson et al. (2018) found that female solicitors and minority ethnic solicitors were 76 percent and 49 percent less likely to reach partnership, respectively, and these negative effects were particularly pronounced at prestigious large corporate and specialist law firms.

Similarly, studies on social class of origin have shown that social class, typically defined by parental occupational background and educational opportunities, may substantially affect social mobility outcomes. For instance, Friedman, Laurison & Miles (2015), in their analysis of Great British Class Survey (GBCS) data, found significant income differentials within various elite professional occupations, based on the occupational category (NS-SEC) of the subject's parents, with class origin pay gap or 'class ceiling' ranging from £5000 in medicine to £24000 in financial services for respondents whose parents were in

manual or semi-manual occupations. Further, several qualitative studies have explored specific mechanisms through which class origin matters in professional occupations, as professionals from lower class backgrounds face substantial challenges from their lack of social and cultural capital, class bias, perceived lack of fit and emotional dislocation (Hurst 2019; Hurst 2018; Ashley and Empson 2013 & 2017; Ashley et al. 2015).

However, while prior research, has looked at various ethnicity-race, gender and class based inequities in higher education and elite professional occupations, overall, there is limited research which holistically takes into account the important issue of intersectionality of penalties or privileges associated with ethnicity-race, gender and class. Even when intersectionality is considered, there is an emphasis on race and gender intersection, while class or socio-economic background, particularly parental occupation, is typically not included (Tomlinson et al, 2018; Hurst, 2019). This is particularly problematic as class background is a key factor in explaining unequal outcomes in higher education and professional occupations (see Dilnot & Boliver 2018; Steven et al. 2016; Boliver 2017 & 2013; Laurison & Friedman 2016; Ashley et al. 2015). For instance, in their resume audit study of gender and class intersection in application to elite law firms, Rivera & Tilcsik (2016) found that higher class male applicants received more than four times interview callbacks than the average of the other three groups (higher class-female, lower class-female and lower class-male applicants). Further, they also found that higher-class signals increase the probability of receiving interview callbacks, but only for men, and not women. In the same vein, Laurison and Friedman (2016) found that women and ethno-racial minorities suffer double penalty based on class origin and gender or race. This is an important issue as it shows that class of origin may moderate the effects of other characteristics, especially gender, and class privileges and gender or ethnic penalties in the professional labour market may exist simultaneously. Hence, there is increasing recognition of the need for inclusion of

class variables into more common race and gender based intersectional analysis (Hurst, 2019; Tomlinson et al. 2018; Laurison and Friedman 2016).

METHODOLOGY

Research context & data

Student admission into professional higher education programmes presents an important context for exploring social mobility because professional undergraduate programmes form the key route of entry into elite professional occupations. We explore recent three year undergraduate admissions offer data, for years 2015, 2016 and 2017, from a mid-rank Russell Group university located in the north of England. We used three-year data, instead of just one year, in order to minimize any random year specific variation in admission offer patterns. While at first glance using admission offer data from a single university may seem to be limiting, we argue that our data may be appropriate for this analysis for two reasons. First, as a non-Oxbridge top quartile university, this university is highly representative of the student body offered admissions at high status British universities, especially non-Oxbridge Russell Group universities. Second, by analysing admission offers we are able to incorporate a much wider set of successful applicants during the years 2015-2017 into our sample. As students can apply simultaneously to up to five different universities through the Universities Central Admissions Services (UCAS) main scheme, our data sample is not university specific and almost 80 percent of the students offered admission end up accepting a place in some other, comparable or better ranked, university.

We followed a multi-step data preparation process to reach the appropriate sample for examining our research question. First, we identified and defined key variables for measuring our concepts of interest - professional programmes, non-professional programmes, ethnicity-race, gender and class. Next, we cleaned and systematised the dataset, by removing foreign students and students educated in foreign educational institutions, as, (1) they may inflate the numbers in certain groups (for example, conflating a student from China with a British-

Chinese ethnicity student), leading to spurious results; and (2) the variables for measuring class were mostly missing for foreign students. This cleaning process led to the final sample of 85,282 students (81% of the initial population of 105,913), on which we carried out our final data analysis.

Variables

Our dependent variable is the undergraduate programme of admission. By examining university classification of all the undergraduate programmes, we categorised and aggregated them into eight programme types – six elite professional programmes, other professional programmes and non-professional programmes. The six elite professional programmes included medicine (including dentistry), law, accounting, architecture, engineering (including IT), and business management (including finance). The category of "other professional programmes" includes several smaller, non-traditional, and relatively new occupations, such as pharmacology, journalism and education, which share some traits of a profession, and lead to specialized occupational jobs for students. It is important to differentiate them as they form a category distinct from both the six elite professional programmes and generalist non-professional programmes, our baseline comparison programme category. Rest of the programmes - sciences, general arts, humanities and other social sciences - were categorized as non-professional programmes. Further, we also removed math and economics undergraduate programmes from the non-professional programmes category as they have recently emerged as key degrees for entry into financial services graduate level jobs, suggesting a key pathway, in addition to business management finance degrees (Institute of Fiscal Studies 2018). Overall, the dependent variable 'programme of admission' was coded on a 0 to 7 scale: nonprofessional programmes (baseline) as 0, medicine as 1, law as 2, accounting as 3, architecture as 4, engineering as 5, business management as 6 and other professions as 7.

Following our research question, we identified appropriate independent variables. First, ethnicity-race is measured through three variables - White, Asian and Black – representing the predominant majority of ethno-racial groups across the university. Second, gender is measured through the variable 'women'. Third, we measure class through two variables: type of school attended during A levels and parent's occupational background (NS-SEC). We identified three different types of schools: two types of selective schools – 'private schools' and 'grammar schools' – and, third, non-selective 'state school' (which incorporates all state supported schools, including academies). Our second measure of class is based on parent's occupational background. NS-SEC classification measures parent's occupational background through an established seven-point classification (NS-SEC 1 – 7) of occupational categories: (1) higher managerial, (2) lower managerial, (3) intermediate occupations, (4) small employers, (5) routine occupations, (6) semi-routine occupations and (7) lower supervisory functions. For this study, we collapsed these seven categories in two variables: managerial and professional occupations (MPO), which includes NS-SEC 1, 2 3 & 4, and routine occupations (RO), which includes NS-SEC 5, 6 & 7. We also measure A-levels grade profile, an important factor which has obvious significance for admission into elite professional undergraduate programme, by including the control variable ABB+, which was the benchmark A-level attainment criteria for admission into high demand elite professional programmes at this university.

Analysis

To examine the effect of intersection of student's ethnicity-race, gender and class attributes on the relative likelihood of admission into elite professional programmes, we use multinomial logistic regression. Multinomial logistic regression tests the effect of independent variables (ethnicity-race, gender, type of school and parent's occupational background) for every dependent variable category (six types of elite professional

programmes) in comparison to the baseline category (non-professional programmes). We examine intersection by testing for the effects of various interaction variables, overlaying them one by one. For instance, we test multiple models with race (white), race-gender (white-men), race-gender-parent's occupation (white-men-MPO) and race-gender-parent's occupation-A level school (white-men-MPO-private school). We follow this process for each ethno-racial group. All the models, including interaction variables, also controlled for independent effects of ethnicity-race, gender, class, and A-level educational attainment (ABB+). Statistical analysis was run using STATA 16.

FINDINGS

Table 1 includes the descriptive statistics, that is, percentage distribution of various independent variables (ethnicity-race, gender and class attributes) and control variable (ABB+) across different types of programmes of admission. In table 2 we present the most and the least privileged intersections for each ethno-racial and gender combination. For example, white-men or white-women, and then add both variables representing higher class position – parents with managerial and professional occupational background (MPO) and student's A level school education at private school or grammar school – or, lower class position – parents with routine occupational background (RO) and student's A level school education at a state school. The cells highlighted in red show lower class combinations which are significantly less likely to enter a professional programme, representing lack of potential social mobility. The cells highlighted in green show lower class combinations which are significantly more likely to enter a professional programme, representing high potential social mobility. The cells highlighted in blue show higher class combinations which are significantly more likely to enter a professional programme, representing status quo. In appendix A we present the complete intersectional analysis, wherein we consecutively

overlay both the class indicators (parent's occupational background and type of A-level school) on every ethnoracial-gender combination.

The probability ratios presented in table 2 and appendix A have to be interpreted as the relative likelihood of admission into various professional programmes *in comparison* to non-professional programmes. For example, the odd ratio for white male students in engineering is 1.49. This should be interpreted as likelihood of white-men entering engineering is 49 percent (1.49 - 1) more than the likelihood of white-men entering non-professional programmes, suggesting positive social mobility**.** Overall, our intersectional analysis presents five key interesting, and sometimes counterintuitive, findings.

Insert table 1 here

Insert table 2 here

Class ceiling in professional higher education

Our first key finding is consistent with the recent research showing a class ceiling in various social mobility relevant outcomes. We find that, overall, students from higher class background, that is, those with parents in managerial and professional occupations (MPOs) and having attained A-level education at private and grammar schools, are more likely to enter most of the elite professional programmes. As shown in figure 1, higher class intersections (blue bars) form the majority of combinations with odd ratios greater than 1. In contrast, very few lower class intersections (black bars), that is, students with parents in routine occupations (ROs) and A-level education at state schools, show odd ratio more than 1. In fact, figure 1 shows near mirror opposite class representation, with most odd ratios less than one being black bars (lower class intersections) and most odd ratios more than one being blue bars (higher class intersections).

Insert figure 1 here

Specifically, we find that exemplar traditional professional programmes, such as, medicine and law, present the most extreme case of class privileges and penalties. Higher class background substantially increases the relative likelihood of entering medicine programme for most ethnoracial-gender combinations. For example, as shown in table 2, white men and white women with MPO parents and grammar school education are 78 percent and 31 percent more likely to enter medicine, respectively. Similarly, Asian men and women from higher class background are 18 percent and 21 percent more likely to enter medicine, respectively. In contrast, we didn't find any lower class intersection (except for white women) which was relatively more likely to be enter medicine. Asian men and women, and black men from lower class background, that is, those with parents in ROs and attended state schools, are 18 percent, 26 percent and 66 percent less likely to enter medicine, respectively.

Gendered privileges and penalties of class

Second, we find strong evidence of the gendered nature of class privileges and penalties. As shown in table 2, women from higher class background (MPO parents and private or grammar school education) across ethno-racial categories are either more likely to enter various elite professional programmes or are not likely to suffer any class penalty. For example, white women from higher class backgrounds are more likely to enter all the professional programmes, except law. They are 91 percent more likely to enter business management, 87 percent more likely to enter engineering, 82 percent more likely to enter accounting, 60 percent more likely to enter architecture, and 31 percent more likely to enter medicine. On the other hand, white women from lower class background (parents in ROs and state school education) are either less likely to enter elite professional programmes (36

percent less likely to enter engineering and 29 percent less likely to enter architecture) or have no significant effects for most professional programmes, except medicine, which they are 17 percent more likely to enter. In contrast, to compare, white men from lower class background are not less likely to enter any elite professional programme, except law, and are 37 percent more likely to enter architecture and 21 percent more likely to enter engineering.

Following we explain the gendered nature of class privileges with two specific examples. Within our sample, the most illustrative case of gendered class privileges and penalties are for white-women entering technical math based professional programmes (e.g. engineering, accounting & finance, and architecture). Most media coverage, even policy discussions, of women in technical professions tend to present a highly gendered narrative regarding entry of women in these fields, especially engineering and IT, wherein gender is the key variable of interest and focus. As illustrated in figure 2A, we find that while, overall, white-women are 34 percent less likely to enter engineering programmes, white women from higher class backgrounds (white-women-MPO-Private School and white-women-MPO-Grammar School) are 67 and 87 percent more likely to enter engineering programmes, respectively. In contrast, white women from lower class background (white-women-routine occupation-state school) are 36 percent less likely to enter engineering programmes. Figure 2B shows similar inversion of odd-ratios based on class background in the case of Asian women in medicine.

With respect to other professional programmes, we find that white women from higher class background, e.g., those with MPO parents and grammar schools education, are 82 percent more likely to enter accounting programme and those with MPO parents and private school education are 60 percent more likely to enter architecture programme. In contrast, white women from lower class background (white-women-RO-State School) are not significantly more likely to enter accounting programmes and are 29 percent less likely to

enter architecture. Overall, our analysis shows that instead of gender, it is class which should be the focal variable of interest.

Insert figures 2A & 2B here

Ethno-racial counterbalance to gender-class Penalty

Our third key finding shows that minority ethno-racial background may, to some extent, counterbalance gendered class penalty suffered by women from lower class background. Specifically, we find that women from ethno-racial minorities do not show same levels of class penalties as do white-women, especially in technical math based programmes, such as architecture and engineering. The case of engineering programmes provides the most interesting, and somewhat complicated, illustration of the complex interactions between ethnicity-race, gender and class. While hitherto considered a highly gendered male professional field, we find that both gender and class effects vary substantially based on ethnicity-race.

For example, as illustrated earlier, for white women, class background leads to both penalties and privileges in terms of admission to engineering programme. Those from higher class backgrounds are up to 87 percent more likely to enter and those from lower class background are 36 percent less likely to enter engineering programmes. Asian and Black women from higher class background enjoy similar privileges. Asian and black women with MPO parents and private or grammar school education are 78 percent more likely to enter engineering programme and four times more likely to enter architecture programme, respectively. However, in contrast to white women, lower class background for Asian and black women doesn't necessarily lead to any penalty in terms of admission to technical math based professional programmes (engineering, accounting and architecture) and they are not less likely to enter any of these programmes.

Double jeopardy of gender and ethnicity-race for black men

Fourth, the case of black ethno-racial group presents very interesting results in terms of the reversal of assumed gender penalties and class privileges. Our findings show that black men not just suffer from penalties of lower class background, they also don't benefit from any higher class background privilege. Black men from higher class background (MPO parents and private or grammar school education) are not more likely to enter any elite professional programme and are, in fact, 81 percent less likely to attend business management programmes. Simultaneously, they also suffer substantial class penalty and black men from lower class background are significantly less likely to attend traditional professional programmes, such as medicine and accounting, by 66 percent and 39 percent, respectively. Further, even engineering programmes, which neither White nor Asian men from lower class background are less likely attend, black-men from lower class background are less likely to attend by 42 percent. These findings suggest that black-men may suffer from intersecting penalties of gender, ethnicity-race and class. In contrast black women do not suffer such class penalties, for any elite professional programme.

The curious case of the most privileged intersection

Finally, fifth, we present our most counterintuitive result, the case of the most privileged intersection of ethnicity-race, gender and class – white men with MPO parents and private schools education. Prior research has established that white men from the most privileged class background tend to outperform other categories in attaining various social mobility outcomes. However, counterintuitively, our results show that white male students from most privileged class background (white-men-MPO-Private School) are not more likely to attend any of the elite professional programmes and are, in fact, significantly less likely to attend math based technical programmes, such as architecture (by 38 percent) and engineering (by 17 percent).

While this result may seemingly contradict prior research, we believe that it may be explained through three reasons. First, students from such highly privileged backgrounds tend to have the capital and resources to choose subjects they might be interested in or are traditionally considered high status, especially prestigious social science and humanities subjects, such as politics, philosophy and economics. Second, prior research shows that such students are able to leverage their parent's capital, especially networks, to enter prestigious occupations, such as management consultancy, investment banking and law, irrespective of their undergraduate programme subject (see Hurst 2018). Third, recent research has also shown that postgraduate programmes are becoming increasingly important in labour markets (see Wakeling & Laurison 2017). Hence, students from privileged backgrounds can undertake postgraduate conversion courses leading to entry into elite occupations (e.g. law) or pursue specialist masters' programmes (e.g. MSc and MBA) to enter administrative managerial roles.

CONTRIBUTIONS & DISCUSSION

Our study makes three specific contributions. First, we contribute directly to the literature on social mobility relevant outcomes in higher education. Recent research has focussed on differential rates of admission of traditionally underprivileged groups in comparison to the benchmark category –white men from higher class background - into high status universities and high wage premium subjects, typically professional undergraduate programmes (Reay et al. 2001; Shiner & Noden 2015; Dilnot & Boliver 2018; Boliver 2017 & 2013; Davies at al. 2013). Our analysis contributes to this stream of research by showing how we can also measure social mobility by comparing the probability ratios of admission of the focal group in high wage premium professional programmes, in comparison to non-professional programmes. While comparing various social groups (e.g. white men from higher class background versus others) provides us with better understanding of the existing

hierarchy of privileges and penalties, comparing the admission of focal group across programme types may help us attain better understating of potential future social mobility of that group. Such an analysis is more appropriate for assessing potential social mobility through higher education as it allows us to compare intersecting categories (ethnicity-race, gender and class) and assess if some groups are more or less likely to enter specific professional programmes (our measure for potential social mobility) and achieve long term social mobility. Groups which are more likely to enter different professional fields, are also more likely to achieve social mobility in future, through professional careers (which are more difficult to enter with non-professional degrees, though not impossible). Hence, our study provides an additional methodological lens to explore social mobility via higher education.

Second, this study contributes directly to current research highlighting the importance of class background in defining various social mobility outcomes, also referred to as the class ceiling. Recent research has attempted to develop a more nuanced and occupationally specific analysis of social mobility and has shown that class background has substantial impact on various social mobility outcomes, such as differential incomes within the same profession (Laurison & Friedman 2016). The central argument here is that the key processes of social reproduction of inequalities, such as closure, emerge at the level of specific professional occupation. Our results provide further empirical support for this line of research, particularly in higher education. We find that student's class position provides both privileges and penalties in terms of relative likelihood of admission into prestigious undergraduate professional programmes. These findings have direct implications for social mobility as these professional programmes form the key pathways for admission into high wage premium elite occupations and our results show that class ceiling may not just apply within elite occupations, but before that too. The class penalties and privileges in admission into professional programmes may further exacerbate class ceiling effects endured by various

groups, as they suffer from penalties both at the point of admission into the professional programme and then at the point of entry into the professional occupation.

Third, our study directly responds to the recent calls for fuller inclusion of class in intersectionality based research, which has tended to focus predominantly on ethnicity-race and gender (Hurst 2019; Tomlinson et al. 2018). Our analysis shows how an intersectional approach including class may help disentangle some of complex relationships between ethnicity-race, gender and class and provide better explanation for various social mobility outcomes. We find that not only the class of origin is of paramount importance when explaining relative rates of admission into elite professional programmes, it may also moderate the presumed effect of gender on entry into technical and engineering fields in defining ways. Simultaneously, we also find that ethno-racial background may mitigate some of the class penalty in terms of admission into elite professional programmes, supporting recent literature on impact of ethnic background (see Davies et al. 2013).

LIMITATIONS & AVENUES FOR FUTURE RESEARCH

This research suffers from three key limitations and following we suggest associated avenues for future research. First, our data, taken from a top quartile Russell Group university in the north of England, while appropriate for exploring our research question, may not be fully representative of either the national university admission cohort or the highly stratified higher education field in UK. We suggest that future research may adopt our analytical approach – of comparing likelihoods of admissions across professional and non-professional programmes within the focal category of consideration – and apply it to a more representative sample, following, for example, Shiner & Noden (2015). Such an analysis would help incorporate another important source of mobility through higher education – the prestige of university attended. Considering university prestige and admission into professional

programmes together may provide a more holistic assessment of social mobility via higher education.

Second, our analysis examines admission offer data. While such an analysis can help us assess intersectionality of ethnicity-race, gender and class in various professional programmes, the data is not appropriate for explaining potential reasons for these effects, such as, the influence of family background (e.g. second generation immigrant), culture, peer pressure and school environment on subject choices made by students during A-levels, that is, choice of various facilitating subjects, and differential rates of application to various programmes at the point of application to universities. Future research may quantitatively compare application rates with admission rates for a more robust application of our proposed model. Further, qualitative scholars may explore various influencing factors driving subject choices in-depth, using both ethnographic and grounded theory approaches.

Third, while we posit that an undergraduate degree forms the most dominant route for entry into most elite professional occupations, we acknowledge that careers in some elite professional occupations can be accessed without the relevant undergraduate degree, such as, through suitable postgraduate degrees (e.g. MBA for business management), conversion courses (e.g. law) and in-house training (e.g. accounting, financial services and management consultancy). We speculate that a comparative analysis of graduate labour market entry patterns, which contrasts gender, class and race-ethnicity backgrounds of those entering with professional degrees and those without them, may help us established novel ways in which gender, ethnicity-race and class based privileges operate in labour markets.

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Table 1: Descriptive statistics – Distribution of student attributes across programmes (percentage)

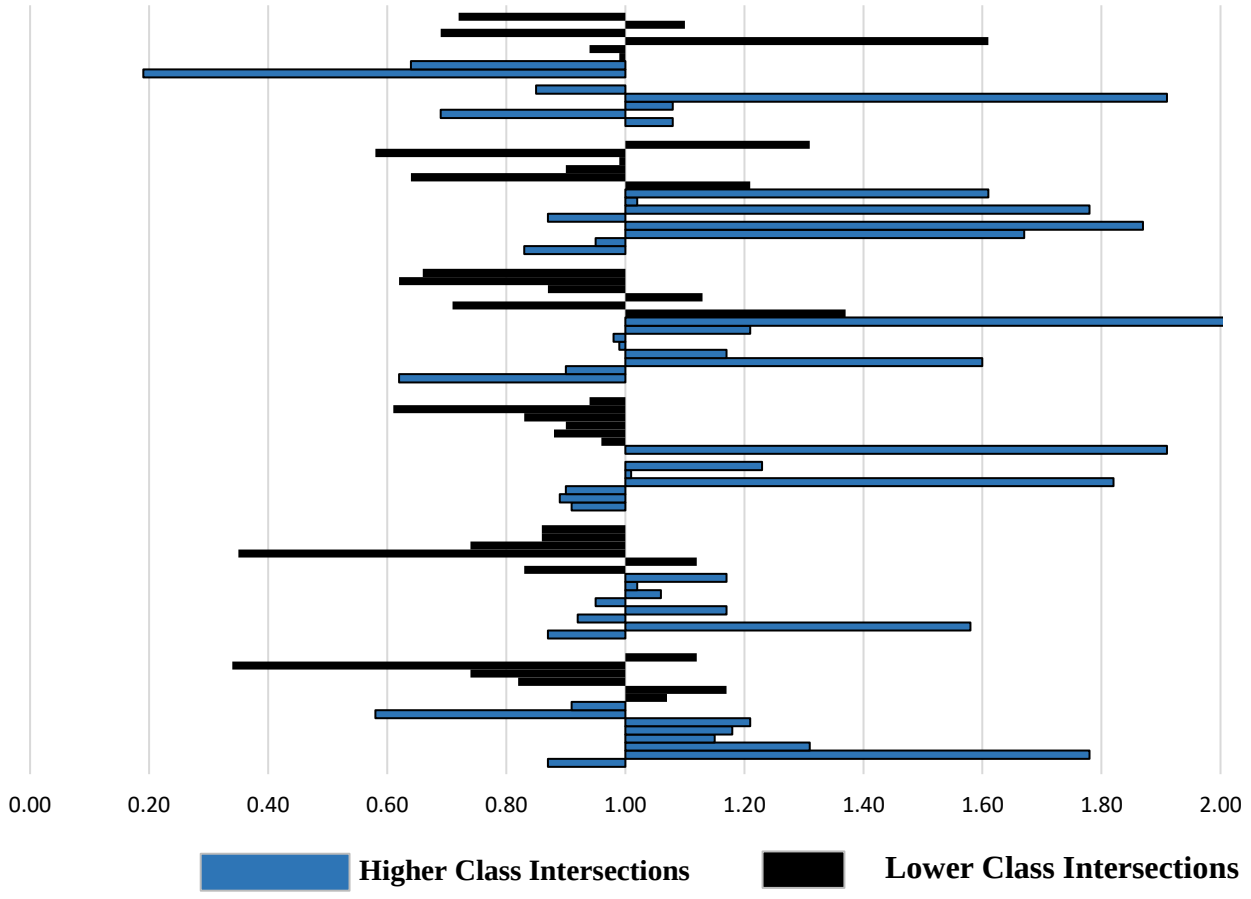
	Measurement Variable	Medicine (9285)	Law (3737)	Accounting (2498)	Architecture (1489)	Engineering (9877)	Business Management (6325)	Other Professions (12365)	Economics & Math (3846)	Non Professional Programmes (35860)	Total (85282)
Gender	Female	55.32	65.03	34.31	47.01	14.84	43.4	65.56	31.54	60.40	51.96
Ethno-Racial Group	White	63.49	84.45	76.94	77.9	78.37	88.93	80.65	87.18	91.37	83.95
	Asian	21.53	7.06	14.65	9.94	10.54	4.51	9.9	5.72	2.76	7.67
	Black	5.69	3.21	3.26	4.43	4.54	2.67	3.41	1.82	1.26	2.77
	Others	9.29	5.28	5.15	7.73	6.55	3.89	6.04	5.28	4.61	5.61
Parental Occupational Background	Managerial & Professional Occupations (NS-SEC 1-4)	70.91	72.81	73.26	73.88	71.18	78.92	73.33	79.17	78.59	75.69
	Routine Occupations (NS-SEC 5-7)	29.09	27.19	26.74	26.12	28.82	21.08	26.67	20.83	21.41	24.31
A-level School Type	Private School	13.53	10.68	15.85	20.28	11.61	30.37	16.46	17.29	23.07	19.22
	Grammar School	4.39	8.13	7.69	3.9	4.1	4.06	4.21	4.11	3.37	4.11
	State School	82.08	81.19	76.46	75.82	84.29	65.57	79.34	78.6	73.56	76.66

*The number in brackets for each undergraduate programme in the first row is the absolute number of students in that programme category.
*The table inputs are percentages. E.g. the number of medicine students in the sample in 9285; 55.32% medicine students are female; 63.49% are white; and 70.91% have parents in managerial and professional occupations (NS-SEC 1-4).

Table 2: Relative likelihood of admission into professional programmes – Most and least privileged intersections (odd ratios)

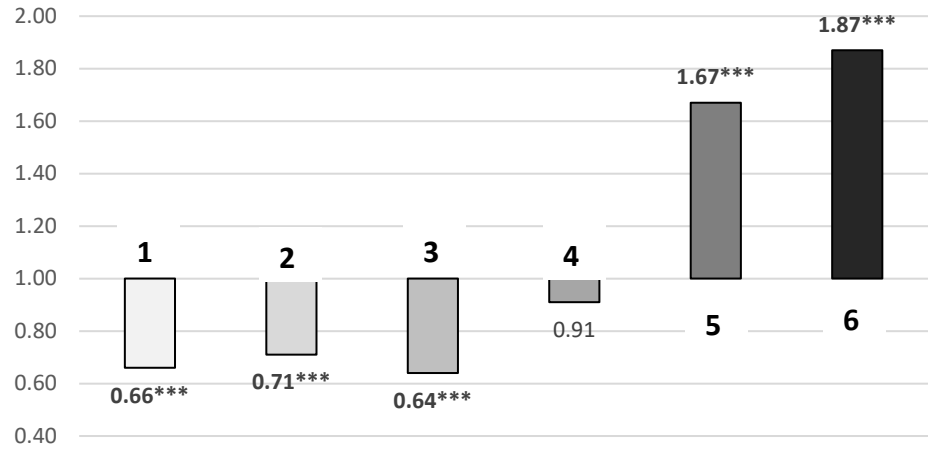
Ethnicity/Race-Gender-Class Intersection	Medicine	Law	Accounting	Architecture	Engineering	Business Management
White-Men-Managerial & Professional Occupations-Private School	0.87*	0.87	0.91	0.62***	0.83**	1.08
White-Men- Managerial & Professional Occupations-Grammar School	1.78***	1.58***	0.89	0.90	0.95	0.69**
White-Men-Routine Occupations-State School	1.07	0.83**	0.96	1.37***	1.21***	0.99
White-Women- Managerial & Professional Occupations-Private School	1.31***	0.92	0.90	1.60***	1.67***	1.08
White-Women- Managerial & Professional Occupations-Grammar School	1.15	1.17	1.82***	1.17	1.87***	1.91***
White-Women- Routine Occupations-State School	1.17***	1.12	0.88	0.71***	0.64***	0.94
Asian-Men- Managerial & Professional Occupations-Private/Grammar School	1.18*	0.95	1.01	0.99	0.87	0.85
Asian-Men- Routine Occupations-State School	0.82*	0.35*	0.90	1.13	0.90	1.61***
Asian-Women- Managerial & Professional Occupations-Private/Grammar School	1.21**	1.06	1.23	0.98	1.78***	1.00
Asian-Women- Routine Occupations-State School	0.74***	0.74*	0.83	0.87	0.99	0.69*
Black-Men-MPO- Managerial & Professional Occupations-Private/Grammar School	0.58	1.02	1.00	1.21	1.02	0.19***
Black-Men- Routine Occupations-State School	0.34***	0.86	0.61*	0.62	0.58***	1.10
Black-Women- Managerial & Professional Occupations-Private/Grammar School	0.91	1.17	1.91	5.58***	1.61	0.64
Black-Women- Routine Occupations-State School	1.12	0.86	0.94	0.66	1.31	0.72

FIGURE 1
Class background and relative likelihood of entry into elite professional programs



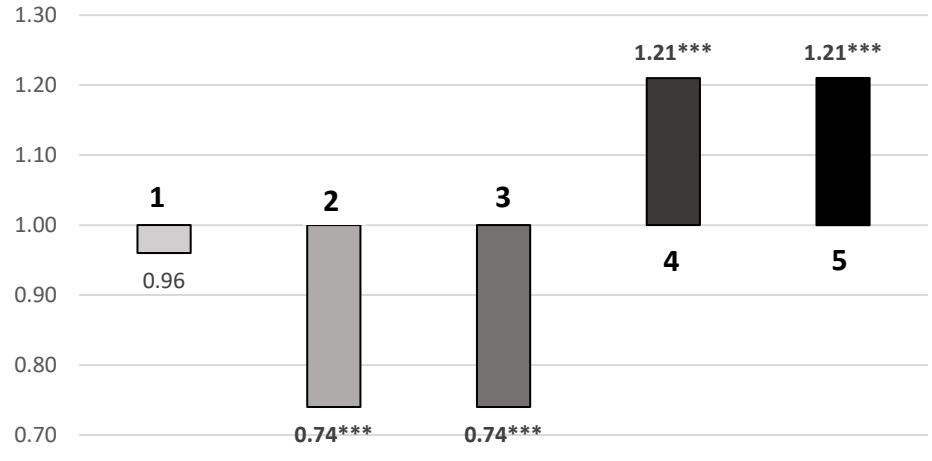
* X-axis shows odd-ratios (relative likelihood of entry)
* Each bar in the graph represents unique professional programme, ethnoracial, gender and class combination (e.g. white-men-middle class-medicine)
*Higher class intersections include all ethnoracial-gender categories with parents in managerial and professional occupations (NS-SEC 1-4) and A-level education at Private / Grammar School.
*Lower class intersections include all ethnoracial-gender categories with parents in routine occupations (NS-SEC 5-7) and A-level education at a non-selective State School.

FIGURE 2A
White-Women in Engineering



1. White-Women (34% less likely)
2. White-Women-Routine Occupations (29% less likely)
3. White-Women-Routine Occupations-State School (36% less likely)
4. White-Women-Managerial & Professional Occupations (neither less nor more likely)
5. White-Women- Managerial & Professional Occupations-Private School (67% more likely)
6. White-Women- Managerial & Professional Occupations-Grammar School (87% more likely)

FIGURE 2B
Asian-Women in Medicine



1. Asian-Women (neither less nor more likely)
2. Asian-Women-Routine Occupations (26% less likely)
3. Asian-Women-Routine Occupations-State School (36% less likely)
4. Asian-Women-Managerial & Professional Occupations (21% more likely)
5. Asian-Women- Managerial & Professional Occupations -Private/Grammar School (21% more likely)

Appendix A: Relative likelihood of admission into elite professional programmes – Ethno-racial, gender, class intersections (odd ratios)

Intersection	Medicine	Law	Accounting	Architecture	Engineering	Business Management
White-Men	0.97	0.90	0.99	1.07	1.49***	0.82**
White-Men-MPO	1.00	1.08	1.00	0.87	1.07	0.96
White-Men-MPO-PS	0.87*	0.87	0.91	0.62***	0.83**	1.08
White-Men-MPO-GS	1.78***	1.58***	0.89	0.90	0.95	0.69**
White-Men-RO	0.99	0.83**	1.00	1.30**	1.14**	0.93
White-Men-RO-SS	1.07	0.83**	0.96	1.37***	1.21***	0.99
White-Women	1.02	1.10	1.00	0.92	0.66***	1.21**
White-Women-MPO	0.96	0.96	1.01	1.19*	0.91	1.10*
White-Women-MPO-PS	1.31***	0.92	0.90	1.60***	1.67***	1.08
White-Women-MPO-GS	1.15	1.17	1.82***	1.17	1.87***	1.91***
White-Women-RO	1.07	1.11	0.97	0.70***	0.71***	0.97
White-Women-RO-SS	1.17***	1.12	0.88	0.71***	0.64***	0.94
Asian-Men	1.03	1.17	0.94	1.09	0.68***	1.23
Asian-Men-MPO	1.18*	0.95	1.01	0.99	0.87	0.85
Asian-Men-MPO-PS/GS	1.18*	0.95	1.01	0.99	0.87	0.85
Asian-Men-RO	0.82*	0.35*	0.90	1.13	0.90	1.61***
Asian - Men - RO - SS	0.82*	0.35*	0.90	1.13	0.90	1.61***
Asian-Women	0.96	0.85	1.05	0.90	1.45***	0.81
Asian-Women-MPO	1.21**	1.06	1.23	0.98	1.78***	1.00
Asian-Women-MPO-PS/GS	1.21**	1.06	1.23	0.98	1.78***	1.00
Asian-Women-RO	0.74***	0.74*	0.83	0.87	0.99	0.69*
Asian-Women-RO-SS	0.74***	0.74*	0.83	0.87	0.99	0.69*
Black-Men	0.61***	1.13	0.94	0.70	0.63***	1.32
Black-Men-MPO	1.11	1.30	1.28	0.88	1.01	1.21
Black-Men - MPO – PS/GS	0.58	1.02	1.00	1.21	1.02	0.19***
Black-Men-RO	0.34***	0.86	0.61*	0.62	0.58***	1.10
Black-Men-RO-SS	0.34***	0.86	0.61*	0.62	0.58***	1.10
Black-Women	1.61***	0.88	1.05	1.41	1.58***	0.75
Black-Women-MPO	1.44***	1.00	1.08	1.86**	1.55***	0.86
Black-Women-MPO-PS/GS	0.91	1.17	1.91	5.58***	1.61	0.64
Black-Women-RO	1.12	0.86	0.94	0.66	1.31	0.72
Black-Women-RO-SS	1.12	0.86	0.94	0.66	1.31	0.72

MPO: Parents in Managerial & Professional Occupations (NS-SEC 1-4)
RO: Parents in Routine Occupations (NS-SEC 5-7)
PS: Private School (A-level)
GS: Grammar School (A-level)
SS: State School (A-level)