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When and for Whom Does It Pay to Attend a Prestigious University? Social Origin, Elite Education and Graduates' Career Trajectories

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NON-TECHNICAL SUMMARY

The claim that prestigious universities provide higher labor market returns to their graduates than non-prestigious universities is subject to controversial scientific and public debate. A common argument is that the higher returns of graduates from prestigious universities stem from the quality of teaching and support networks provided. However, a simple comparison of returns provided by universities with varying prestige is likely misleading as it does not take into account pre-university student characteristics. For example, students of higher academic ability and higher socio-economic backgrounds are more likely to gain access to prestigious universities. Aside from the issue of selection, it is unclear whether graduating from prestigious universities pays off long-term and whether it is more beneficial for students most likely or least likely to attend university.

The paper used data on individuals born in England, Scotland, and Wales in a single week in 1970 and followed a subsample from graduation for up to 14 years in the labor market. The birth cohort data are advantageous in providing a rich set of graduates' pre-university characteristics and in allowing me to assess graduates' occupational mobility across early- and mid-career. The paper addresses two research questions: (1) Are there differences in career progression between graduates from prestigious Russell Group universities and other universities? (2) Is graduating from Russell Group universities more beneficial for first-generation graduates or graduates whose father and/or mother already gained a degree?

The results show that a degree from a Russell Group university does not yield advantages in occupational prestige in the first job. However, graduates from Russell Group universities have a steeper growth in occupational prestige in the early labor market career than graduates from other universities. In later stages of the career, graduates from other universities catch up with their peers from prestigious universities and gain the same level of occupational prestige. I only find an early advantage of graduating from Russell Group universities for first-generation students, i.e., students who are least likely to attend these universities benefit the most from it. This result suggests that Russell Group universities provide them with resources (e.g., social networks) that are beneficial in the early stages of the career and that they, otherwise, would not have.
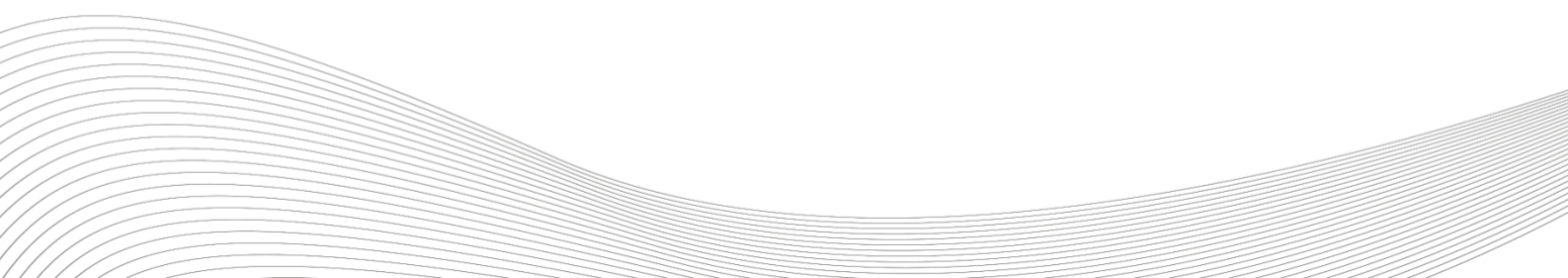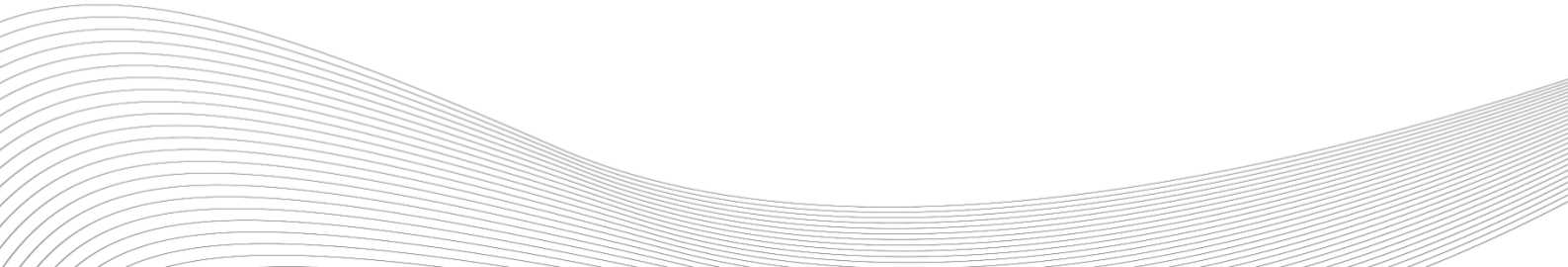
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ABSTRACT

The literature on social stratification has paid considerable attention to the question of whether and to what extent attending prestigious universities is advantageous for graduates' labor market returns. This paper contributes to the literature by applying a more dynamic perspective in asking whether graduates from prestigious and less prestigious universities differ in their career progression across fourteen years since their labor market entry. It further investigates whether graduating from prestigious universities pays off more or less for graduates from different educational backgrounds. While the positive selection hypothesis suggests that students who are most likely to attend prestigious universities will benefit the most from it, it is students who are least likely to attend under the negative selection hypothesis. The empirical analysis draws on the 1970 British Cohort Study (BCS70) following the lives of people born in England, Scotland, and Wales in a single week of 1970. To analyze differences in career progression between graduates from different institutions in a holistic way, I applied multilevel growth curve modeling. Results show that graduates from prestigious Russell Group universities have steeper growth curves in occupational prestige after the initial labor market entry than graduates from other institutions. However, graduates from other universities catch up with their peers in later career stages. The early Russell Group premium is higher for first-generation graduates than for graduates from high educational backgrounds providing evidence for the negative selection hypothesis.

Introduction

Research on the labor market consequences of horizontal stratification in postsecondary education has given much attention to the question whether and to what extent attending prestigious universities is advantageous for graduates' labor market returns (Gerber and Cheung 2008). Studies commonly rank institutions either by 'college quality' - a multidimensional construct including various factors such as mean standardized test scores, expenditures per full-time students and quality of teaching or facilities – or by 'college selectivity'. The latter focuses entirely on mean test scores at admission and is, therefore, considered to be a much more accurate measure of institutional prestige (Witteveen and Attewell 2017). Regardless of differences in measurement, evidence for a causal relationship between institutional prestige and labor market outcomes remains ambiguous. Some US studies found significant positive earnings effects (Brewer et al. 1999; Hoekstra 2009; Loury and Garman 1995; Witteveen and Attewell 2017) or an advantage in occupational status (Brand and Halaby 2006) of the prestige of the institution attended, but other studies did not find effects on earnings (Dale and Krueger 2014; Dale and Krueger 2002; Long 2008). Similarly, for the UK, a few studies showed a wage premium of attending selective universities (Belfield et al. 2018; Broecke 2012; Chevalier and Conlon 2003; Hussain et al. 2009) but others were unable to detect differences in labor market outcomes (Sullivan et al. 2018a; Walker and Zhu 2018).

Most existing studies, however, relied on single snapshot measures of labor market outcomes and did not apply a longitudinal and dynamic perspective on how the prestige of the higher education institution attended shapes graduates' career progression (Gerber and Cheung 2008). Graduates from prestigious institutions may have an advantage in returns at labor market entry compared to graduates from non-prestigious institutions, but this advantage may decrease over time, remain stable, or even increase across the career. Studies

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that found no returns to college prestige at labor market entry also do not know whether returns emerge later on in the career (Thomas and Zhang 2005). Differentiating between labor market entry and career progression also sheds light on the mechanisms for the effect of institutional prestige on labor market outcomes (Borgen 2014; Ishida et al. 1997). If advantages of graduates from prestigious institutions continue to exist beyond the initial stages of the career and assuming that productivity among graduates becomes more visible via their work experience, it will speak against the idea that the selectivity of the higher education institution is merely a signal for future productivity to employers. In recent years, scholars of social stratification increasingly used multilevel growth curve analysis - a more holistic approach of modelling occupational attainment over the life course - to examine inter- and intragenerational mobility simultaneously (Barone et al. 2011; Härkönen et al. 2016; Härkönen and Bihagen 2011; Manzoni et al. 2014; Passaretta et al. 2018; Schulz et al. 2015; Schulz and Maas 2010).

Apart from notable exceptions (e.g., Borgen 2015; Dale and Krueger 2002), studies rarely address whether graduate characteristics such as attending different higher education institutions lead to varying labor market benefits for different socio-economic groups. Whereas the relationship between social origin and labor market destinations is weaker among graduates than among lower educated groups (Breen and Jonsson 2008; Hout 1988; Iannelli and Paterson 2007; Torche 2011), social inequalities at labor market entry among graduates are evident even after accounting for institutional prestige, the field of study or performance (Jacob et al. 2015; Triventi 2013). This suggests that other factors, such as parental resources or social networks, play a role in the allocation of graduates' labor market positions. Students from advantaged backgrounds may not only be more likely to enter prestigious universities (Boliver 2011; Jerrim et al. 2015), allocation to elite positions may act as a 'second filter' for family background, i.e., students from advantaged backgrounds

have more resources to convert educational credentials into prestigious career paths (Rivera 2011).

The paper advances the literature in two significant ways. *First*, following recent advances in modeling careers across the life course, it investigates whether graduates from prestigious and less prestigious universities differ in their career progression across the early and mid-career stages. *Second,* it explores whether graduating from prestigious universities pays off more or less for graduates from different socio-economic backgrounds and at what stages of the career. The empirical analysis draws on the 1970 British Cohort Study (BCS70) following the lives of individuals born in England, Scotland, and Wales in a single week of 1970. I model graduates' career progression from their first significant job up until 14 years in the labor market. The BCS70 allows me to adjust for a rich set of covariates, including measures of cognitive and non-cognitive ability that are commonly unavailable when accounting for selection into prestigious universities.

In what follows, I will first briefly discuss the theoretical considerations of why institutional prestige should matter for labor market outcomes. I further elaborate on why the effect of institutional prestige may vary across graduates from different social origins before presenting data, methods, and the empirical results.

Institutional prestige and graduates' career trajectories

Gerber and Cheung (2008: 301) differentiate between four theoretical explanations on why graduating from prestigious universities leads to higher labor market returns than graduating from non-prestigious universities: *human capital theory*, *social networks, signaling theory*, and *selection bias*.

From a *human capital* perspective, graduates from prestigious universities acquire advanced skills and knowledge during their studies that increase their productivity in the labor market. This may be, for instance, because of higher teaching quality and better support

facilities at prestigious than at non-prestigious universities. In contrast, the level of skills and knowledge attained at prestigious universities is inaccessible to graduates from non-prestigious universities.

Apart from endowing their graduates with better skills, prestigious universities and their academic staff may be advantageous in providing access to top-level occupations because of their direct institutional links to employers or alumni *networks* (Ishida et al. 1997). This labor market advantage for graduates from prestigious universities may also come about through peer networks and informal personal ties among graduates from the same institution. Hence, graduates from prestigious universities profit from access to valuable social networks that provide links to top-level employers or information about job opportunities in the elite labor market that would otherwise be unavailable (Lee and Brinton 2006; Tholen et al. 2013). One example of how elite firms recruit graduates from prestigious universities is via on-campus recruitment programs (Rivera 2011).

According to *signaling theory* (Spence 1973), employers rely on asymmetric information when hiring labor market entrants and are, therefore, unable to measure graduates' real productivity. To compensate for this, they use observable characteristics such as the prestige of the institution attended to evaluate graduates' potential productivity (Morley and Aynsley 2007). Employers use graduate characteristics as a signal if the signaling costs – the investment costs for achieving a signal – are negatively correlated with individuals' productivity level. If this were not the case, every individual would invest in this signal. Hence, employers assume that graduates from more prestigious universities are more productive than graduates from non-prestigious universities. They have this expectation regardless of whether graduates from prestigious universities become more productive during their education or whether they are more productive due to preexisting characteristics. The signaling value of the prestige of the institution attended may have become more pronounced

during higher education expansion as access to prestigious institutions is more competitive and, at the same time, employers need to distinguish the most productive job candidates among an ever-increasing pool of graduates (Bills 2003; Jackson et al. 2005). Evidence suggests that elite firms receive a larger number of applications due to higher education expansion and, therefore, need to find ways to limit the number of suitable candidates (Rivera 2011; Tholen et al. 2013).

These theoretical considerations are also helpful in distinguishing between the effects of the institutional prestige at labor market entry and later career progression. From a *human capital* point of view, one can expect that graduates from prestigious universities gain higher labor market returns than their peers from non-prestigious universities both at labor market entry and during career progression because true productivity differences between these groups exist. As employers may not appropriately assess the potential of graduates from prestigious universities at labor market entry, increasing effects of institutional prestige over graduates' careers are also in line with these assumptions.

Predicting the role of institutional *networks* in shaping the careers of graduates from prestigious universities is less straightforward. Institutional networks may provide advantages in access to elite occupations at any stages of the career. However, one may expect that these networks are particularly important in the initial recruitment process than at later career stages as elite employers approach new graduates directly at university and social ties to graduates, alumni or staff at prestigious universities may loosen across the career. Assuming that institutional networks are the dominant mechanism behind the advantages of graduates from prestigious universities, the effect of institutional prestige later in the career should not be stronger than at labor market entry.

Since the *signaling* theory emphasizes the role of asymmetric information between employers and job candidates, the prestige of graduates' institution is a particularly relevant

signal at labor market entry when information on graduates' real productivity level is unavailable (Arcidiacono et al. 2010; Ishida et al. 1997). Later in graduates' careers, employers can either evaluate their employees' productivity directly or use job candidates' work experience and previous accomplishments as more accurate signals for future productivity (Witteveen and Attewell 2017). Hence, if institutional prestige is associated with higher returns at labor market entry only, this would speak for the assumptions of signaling theory rather than for the notion that prestigious universities provide graduates with skills, knowledge, and networks that are valuable in the long run.

Lastly, the positive association between graduating from prestigious universities and labor market returns may be due to *selection bias*. Students who attend prestigious universities are different regarding preexisting characteristics (e.g., social origin, cognitive and non-cognitive ability) from students who enroll in non-prestigious universities, and these characteristics are associated with higher labor market rewards. To estimate the effect of institutional prestige on labor market outcomes and to shed light on the previously mentioned mechanisms, we need to address selection bias and adjust for theoretically plausible confounders in the analysis. If selection bias were prevalent, we would not find any association between institutional prestige and labor market rewards neither at labor market entry nor during career progression.

The previous literature addressed selection bias by regression adjustment of observable confounders (e.g., Loury and Garman 1995), by exploiting college application data to account for unobserved endowments or ambitions (e.g., Dale and Krueger 2002), by applying sibling and twin fixed effects (e.g., Lindahl and Regnér 2005), or by conducting quasi-experimental designs such as instrumental variables (IV) estimation (e.g., Long 2008) and regression discontinuity designs (e.g., Hoekstra 2009). Analyzing college quality and hourly wages in Norway, Borgen (2014) compared estimates obtained from standard

regression analysis to estimates from more sophisticated analytical techniques. He concluded that substantive results did not depend on the modeling approach suggesting that adjusting for common observable confounders is sufficient to estimate the effect of university prestige on labor market outcomes (see also Long 2008).

Returns to institutional prestige by social origin

Whether and to what extent institutional prestige is advantageous for initial labor market entry and career progression may depend on graduates' family background. To get access to advantageous occupational positions attending prestigious universities may be a necessary prerequisite, but in the end, may not be sufficient to succeed. The *positive selection hypothesis* argues that students who are most likely to attend prestigious universities will also benefit the most from it (Brand and Xie 2010). Since children from more advantaged socio-economic backgrounds are more likely to attend prestigious universities than children from disadvantaged backgrounds (Boliver 2011; Jerrim et al. 2015), they may also have higher returns from attending these universities (Karabel and McClelland 1987). This is because graduates from higher socio-economic backgrounds have more resources to convert educational credentials into prestigious career paths creating a 'second filter' on individuals' social origin (Rivera 2011).

One mechanism by which this 'second filter' may manifest itself is via differential access to institutional networks (Tholen et al. 2013). Even though students from lower socio-economic backgrounds managed to enter previous universities, they may be unsuccessful in establishing the social ties needed to harness advantages in access to elite occupations. In contrast, students from higher socioeconomic backgrounds can exploit these institutional ties either because they have wider pre-existing networks including their parents that make these networks accessible or because they have the social skills and the knowledge of how

prestigious universities operate that help them to navigate the social environment (Hamilton et al. 2018).

Another way graduates from higher socio-economic backgrounds may be more able to convert graduation from prestigious universities into higher labor market returns is through characteristics linked to their upbringing (Erikson and Jonsson 1998). For instance, graduates from privileged backgrounds may have advanced social skills, soft skills, or manners that put them at an advantage in job application procedures in the elite job market. Furthermore, social skills and soft skills are increasingly demanded in access to higher managerial occupations as they involve diverse forms of 'people processing' (Jackson 2007; Jackson et al. 2005). Despite having graduated from a prestigious university, graduates from lower social backgrounds may thus be disadvantaged in gaining access to prestigious occupational positions due to their lack of social and soft skills.

Finally, graduates from prestigious universities that come from privileged backgrounds may have advantages in access to elite occupations simply because employers prefer job candidates that are culturally most similar to themselves (Erikson and Jonsson 1998; Jackson 2009). 'Cultural matching' (Rivera 2012) between elite employers and job candidates not only exists when both sides graduated from prestigious universities but also when they come from the same advanced classes of origin. Graduates from lower social backgrounds may, therefore, be disadvantaged in gaining access to advanced occupational positions because they do not have the cultural resources (e.g., familiarity with elite activities, lifestyles and ways of communicating) to signal cultural proximity (Manzoni and Streib 2018; Walpole 2003).

The *negative selection hypothesis* argues that students who are least likely to attend prestigious universities will gain the highest returns (Brand and Xie 2010). Whereas the positive selection hypothesis assumes that graduating from prestigious universities is a

prerequisite for obtaining access to advanced occupational positions, the negative selection hypothesis proposes that graduates from higher socio-economic backgrounds have the necessary socio-cultural resources and knowledge to gain access to elite occupational positions even without educational credentials from prestigious universities (Hamilton 2016). In contrast, graduates from lower socio-economic backgrounds lack these parental resources and can compensate for this lack by accessing resources via attending prestigious universities. Students from lower socio-economic backgrounds attending prestigious universities gain the resources (e.g., social networks, cultural fit) that they, otherwise, would not have when competing with graduates from higher socio-economic backgrounds from non-prestigious universities. Hence, attending prestigious universities is more beneficial for students from lower socio-economic backgrounds than it is for their peers from higher socio-economic backgrounds.

Evidence suggests that a degree is the "great equalizer" of socio-economic inequality in labor market destinations (Chetty et al. 2017; Hout 1988; Karlson 2019; Torche 2011). Similarly, one could argue that a degree from prestigious universities further "equalizes" socio-economic inequality as there is less leeway for parental influence when it comes to job allocation. This is because a degree from prestigious universities is a sufficient marker providing access to elite occupational positions irrespective of graduates' social background. In line with the negative selection hypothesis, social inequalities in occupational positions are smaller among graduates from prestigious universities than they are among graduates from non-prestigious universities. However, research evidence for the US is mixed. Whereas Giani (2016) found a smaller effect of social background on earnings among graduates from selective universities than among graduates from non-selective universities, others showed that the association between social origin and wages is strongest among graduates of the least and most-selective universities (Manzoni and Streib 2018; Thompson 2019).

Data and methods

For the empirical analysis, I use the 1970 British Cohort Study (BCS70) which follows the lives of people born in England, Scotland and Wales in a single week of 1970 (Elliott and Shepherd 2006). Data were collected at birth, age five, 10, 16, 26 and four-year intervals from the age 30 onwards. The latest sweep that is publicly available surveyed cohort members when they were aged 42. In this paper, I use the 1970 British Cohort Study Activity Histories dataset (University of London 2017) including retrospective information on activity histories from the age of 16 until age 42. I merged these data with information on background characteristics at age 10 (Butler and Bynner 2016) and retrospective information (secondary educational qualifications, the timing of graduation, the field of study, class of degree, type of degree) on educational careers from a dataset including the full histories of educational qualifications (Bukodi 2017). These data were further supplemented with retrospective information on other graduate characteristics (field of study, mode of study) and family formation from sweeps six to nine (age 30-42, University of London 2016a, 2016b, 2016c, 2016d). Crucially, at age 42 (sweep nine) the survey asked cohort members retrospectively about the higher education institution at which they gained their degree. Information on secondary school type is drawn from three different sources: the Head Teacher questionnaire in 1986, the School Census data in 1986 (Bynner et al. 2017) and a retrospective question put to the cohort member in 2012.[1]

The analytical sample is restricted to individuals who graduated from a UK higher education institution until the age of 34 and who have been observed until the age of 42. I do not consider any degree attainment after the age of 34 because these individuals are much more selective group, and they do not gain enough labor market experience in my

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[1] If only one source of information existed, I used this information. If there were several sources, the Head Teacher response was prioritized, followed by the School Census information and the retrospective response at the age of 42.

observation period. However, I continue to observe the educational careers (another degree, postgraduate degree) until the age of 42 for those individuals who graduated until age 34.

The dependent variable is the *Standard International Occupational Prestige Scale* (SIOPS) (Treiman 1977) which is a common outcome measure in life course analyses of occupational attainment (Härkönen and Bihagen 2011; Härkönen, Manzoni and Bihagen 2016; Manzoni, Härkönen and Mayer 2014). Occupational prestige is defined as "the general level of social standing enjoyed by the incumbents of an occupation" (Hauser and Warren 1997, p. 188). It is stable over time and across countries (Hout and DiPrete 2006), and also highly correlated with other stratification measures such as ISEI and earnings growth (Lambert and Bihagen 2014). To assign SIOPS scores to occupations, I recoded British SOC90 occupational codes into ISCO-88 codes.

To observe graduates' *career progression*, I use monthly information on their occupational position since they started their first significant job (lasting at least six months). Following graduates for up to fourteen years since their labor market entry, this measure is right-censored at 168 months and will be included in the modeling as seven 24-month splines. Using splines avoids predefining a functional form of the career and allows for variation in career progression across different stages without exploiting too many degrees of freedom. By estimating linear slopes for each range, splines avoid inappropriate jumps that would be prevalent in a simple dummy variable model (Marsh and Cormier 2002).

To operationalize the *prestige of universities*, I differentiate between Russell Group universities and other universities. The Russell Group was founded in 1994 and consists now of 24 'research intensive' UK universities.[2] It has no official role, but membership is

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[2] Birmingham, Bristol, Cambridge, Cardiff, Durham, Edinburgh, Exeter, Glasgow, Imperial College London, King's College London, Leeds, Liverpool, London School of Economics & Political Science, Manchester, Newcastle, Nottingham, Oxford, Queen Mary, University of London, Belfast, Sheffield, Southampton, University College London, Warwick, York.

considered as an indicator of institutional status in the public and policy discourse. It represents itself as the 'jewels in the crown' of the higher education system (Russell Group 2012). Admission to Russell Group Universities is highly selective: private schooling, high entry grades and an advanced social background are the strongest predictors of attendance at Russell Group universities (Boliver 2011, 2013; Hemsley-Brown 2015). This institutional differentiation by selectivity appears to be remarkably stable over time (Raffe and Croxford 2015). Apart from student composition, Russell Group universities also rank higher on "quality" at least when it comes to pupil-staff ratio, research assessment and academic expenditures per student (Chevalier 2014; Chevalier and Conlon 2003).

To account for *selection* into prestigious universities, I adjust the analysis with several important confounders. As students' endowments influence both the choice of university and labor market success, I control for cognitive ability, non-cognitive skills, and highest academic secondary qualification attained. Following Breen and Goldthorpe (2001) and Connelly and Gayle (2019), I measure *cognitive ability* at age 10 by totaling all four conducted British Ability Scales (BAS) assessments (Elliott, Murray and Pearson 1979) – two verbal subscales (word definitions and word similarities) and two non-verbal subscales (recall of digits and matrices) - and standardised it to a mean of 100 and a standard deviation of 15.[3] To operationalize non-cognitive skills I use the psychosocial measure of *locus of control* at age 10. It refers to the degree to which individuals perceive themselves as able to decide over and manage their destiny (internal) rather than other forces (external). In the BCS70, cohort members at age 10 filled in the CARALOC questionnaire (Gammage 1982) which is a general locus of control measure developed specifically for children and closely mirrors the often-used locus of control test by Nowicki and Strickland (1973). Raw scores range from zero to 15, where high scores indicate greater internalization. The measure is

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[3] Alternatively, I could have used principal component analysis (PCA) to create a measure of general ability 'g'. However, Connelly and Gayle (2019) showed that the total scores and scores derived from PCA are almost perfectly correlated.

standardized to have a mean equal to zero and a standard deviation equal to one. Regarding, the *highest secondary qualification attained* I differentiate between three categories: "lower secondary education", "1 A-level (higher secondary – low performance)" and "2+ A-levels (higher secondary – high performance)". Since 2+ A-levels are a common requirement for entry to higher education, graduates with qualifications below this threshold have followed non-standard pathways to university.

Another important confounder to address is the social background. Individuals from advantaged social origins are overrepresented in Russell Group universities (Boliver, 2011, 2013). At the same time, graduates from a higher-class background gain advanced labor market returns, possibly via access to parental resources (Jacob et al. 2015). Therefore, the analysis includes measures of parental education and class of origin at age 10. Regarding *parental education,* I differentiate between graduates that have at least one parent with a degree and those that have parents who both did not attain a degree, i.e., between continuing-generation students and first-generation students. *Class of origin* is operationalized with the National Statistics Socio-Economic Classification (NS-SEC). To construct NS-SEC codes, I rely on additional occupational coding provided by Gregg (2012). I apply the 'dominance principle' using the highest class position among both parents and differentiating three classes: salariat class (higher and lower managerial and professional occupations), intermediate class (intermediate occupations, small employers and own account workers, lower supervisory and technical occupations) and working class (semi-routine and routine occupations). Private and grammar schooling are strong determinants of admission to Russell Group universities (Hemsley-Brown 2015; Sullivan et al. 2014) and labor market outcomes (Dearden et al. 2002; Green et al. 2018). I, therefore, distinguish between the following *secondary school types*: private, grammar (state academically selective schools), secondary modern (state schools for students not selected into grammar schools) and comprehensive

(all-ability state schools). The analyses also accounts] for *gender* and *ethnic origin*. Due to the focus on graduates and, hence, the small number of observations, I can only differentiate between individuals born in the UK and individuals originating from abroad.

Apart from covariates that account for selection into prestigious universities, I also control for graduate characteristics such as field of study, type of degree, class of degree, and mode of study. This is because I am interested in the labor market returns of institutional prestige that is unrelated to any compositional differences of the student population. Prestigious universities may differ from other universities regarding student take-up of more beneficial fields of study, a higher share of full-time students, higher grades on average, or facilitated pathways into postgraduate attainment and, in turn, these factors may be associated with higher labor market returns. To operationalize *field of study*, I differentiate between three broad groups: 1) humanities (incl. arts) 2) social sciences (incl. economics and business, law and medicine), and 3) fields in STEM (science, technology, engineering, and mathematics). The *type of degree* differentiates between first degree and postgraduate degree. The *mode of degree* is measured with two categories: full-time vs. part-time studies. All these measures are time-varying. The measure of *class of degree* consists of the following categories: first, 2:1, 2:2, third, or pass.

In line with a life course perspective, the measure of career progression captures the time since individuals entered the labor market rather than their actual work experience. Hence, it does not account for career circumstances, career breaks, and re-entry into the labor market due to family formation. Therefore, I also adjust the analysis with time-varying measures for *part-time employment*, *the number of children,* and *marital status* (single, married, divorced). Family circumstances are correlated with the type of university attended and yield different labor market returns (Walker and Zhu 2018).

To analyze the association between institutional prestige and occupational attainment across the life course, I use multilevel growth curve modeling (Halaby 2003; Steele 2008). Researchers increasingly use this method when modeling career progression over time (Barone et al. 2011; Härkönen et al. 2016; Härkönen and Bihagen 2011; Manzoni et al. 2014; Passaretta et al. 2018; Schulz et al. 2015; Schulz and Maas 2012). Following an unbalanced panel data structure, I restructured the data into a person-month format. Using random effects (RE) panel regression models allows me to estimate coefficients for time-constant (above all, institutional prestige) and time-varying variables (e.g., postgraduate attainment or the number of children). Growth curve analysis puts particular emphasis on the modeling of time and, in this paper, on the interaction between covariates of interest and time which, in this paper, models the differences in career progression by institutional prestige.

The baseline growth curve model is as follows:

$$y_{it} = \beta_0 + \sum_{k=1}^{7} \beta_{1k} \, Time_{itk} + \beta_2 Russ_i + \sum_{l=1}^{8} \beta_{3l} Select_{il} + \sum_{m=1}^{4} \beta_{4m} Grad_{i(t)m} + \sum_{j=3}^{3} \beta_{5j} \, Fam_{itj} + \mu_i + \varepsilon_{it}$$

(1)

The model includes the seven 24-months splines, a dummy variable differentiating between graduates from Russell Group and other universities, eight time-constant variables accounting for selection, four time-constant and time-varying variables controlling for other graduate characteristics, three time-varying variables adjusting for family formation, a person-specific unobserved factor μ (random effect) and a time-varying error term ε. The intraclass correlation - which is calculated based on the variances of the error terms $(\rho = \sigma_\mu^2 / (\sigma_\mu^2 + \sigma_\varepsilon^2))$ - indicates how much of the overall variance in occupational prestige is due to variation between individuals and due to variation within individuals across the early and mid-career. The stronger this intraclass correlation, the more inequality between

graduates in occupational prestige exists, and the fewer within-changes occur across graduate careers.

The β_{1k} estimates show the average monthly change in occupational prestige within each of the 24-month splines. The remaining β coefficients indicate the strength of associations between the respective variables and occupational prestige averaged across the early working career. To analyze whether graduates from Russell Group and other universities differ regarding career progression, I extend this baseline model by including interaction terms between the Russell Group indicator and the seven splines. Finally, I will estimate this extended model separately for graduates that have at least one parent with a degree and those with parents who both did not attain a degree to test the negative vs. positive selection hypothesis.

The BCS70 is affected by considerable unit non-response across all waves. Only around 20 percent of cohort members participated in all existing waves, over half of the cohort members dropped out of at least one wave but returned to the study and one third dropped from the study entirely (Mostafa and Wiggins 2015). To correct for non-random loss to follow-up, I estimated the inverse probability of attrition weights (Hernán et al. 2000). The attrition weight *aw* is formally defined as the ratio of the unconditional probability that a respondent *i* is observed until age 42 (the latest sweep I use information from) and the same probability conditional on covariates Z measured at age 10. As probabilities are unknown, they are estimated via logistic regression (see Appendix table A1).

$$aw_i = \frac{P(a_i = 0)}{P(a_i = 0 | z_i)}$$

(2)

Weighting the sample in this way created a pseudo-population in which loss to follow-up is independent of the variables included in the prediction model, thus avoiding bias from systematic attrition based on the observed variables.

Results

Table 1 provides an overview of the variables and descriptive statistics for 939 complete cases with 135,962 person-years. In this sample of graduates, SIOPS scores range between 15 (e.g., building construction laborers) and 78 (e.g., university professors and medical doctors), with an average of 55.33 and a standard deviation of 11.35. The average time I observe graduates since their first significant job is almost seven years (SD=34.52 months). One-third of graduates obtained their degree from Russell Group universities. The overwhelming majority of graduates studied full-time (0.94 percent). Social sciences were the most common discipline (0.40 percent), followed by STEM fields (0.32 percent) and humanities (0.28 percent). Whereas the percentage of graduates from a working-class background is small (0.11 percent), almost half of the graduates (0.47 percent) originate from a household in which neither parents obtained a degree. Two-thirds of graduates gained more than two A-levels during their secondary schooling and attended comprehensive schooling.

Table 1. Summary statistics (N=135,962 person-months; 939 graduates)

	Mean/percentage	SD	Min	Max
SIOPS prestige score	55.33	11.35	15.00	78.00
Months since first significant job	81.84	48.26	1.00	168.00
HE institution				
Russell Group	0.34			
Other	0.66			
Field of study				
Humanities	0.28			
Social sciences	0.40			
STEM	0.32			
Type of degree				

Undergraduate	0.87			
Postgraduate	0.13			
Class of degree				
1st	0.09			
2:1	0.44			
2:2	0.34			
3rd or pass	0.13			
Mode of study				
Full-time	0.94			
Part-time	0.06			
Gender				
Female	0.51			
Male	0.49			
Ethnic origin				
UK	0.96			
Non-UK	0.04			
Class of origin				
Working class	0.11			
Intermediate class	0.33			
Salariat class	0.57			
Parental education				
At least one parent with a degree	0.47			
Both parents with no degree	0.53			
Cognitive ability (standardized) at age 10	113.83	12.17	70.45	151.19
Locus of control (standardized) at age 10	0.55	0.89	-2.50	2.64
Secondary school qualification				
No A-levels or equivalent	0.15			
1 A-level or equivalent	0.14			
2+ A-levels or equivalent	0.71			
Type of secondary school				
Comprehensive	0.71			
Independent	0.15			
Grammar	0.09			
Secondary Modern	0.05			

Marital status	
Single	0.57
Married	0.40
Divorced	0.03
Number of children	
Zero	0.72
One	0.13
Two	0.11
Three or more	0.03
Employment status	
Full-time	0.90
Part-time	0.10

Note: Statistics pertain to complete cases in the analytical sample.

Table 2 introduces several growth curve models. The zero model (M0) is an empty model without any covariates and decomposes the total variance into variance between individuals and within-variance across the career. Model M1 includes seven 24-months splines and indicates how occupational prestige, on average, changes across 14 years since graduates had their first significant job. The second model (M2) introduces our primary independent variable differentiating between graduates from Russell Group universities and other universities. Model M3 accounts for selection into prestigious universities holding information on cognitive ability, non-cognitive ability, parental education, parental class, gender, ethnicity, secondary school qualifications, and the type of secondary schooling constant. The fourth model (M4) additionally adjust for graduate characteristics (the type of degree, field of study, class of degree, mode of study). Finally, the fifth model (M5) includes information adjusting for family formation and thus, gaps in the labor market. Estimates for control variables are not shown in table 1 and are included in table A1 in the Appendix.

Table 2. Summary of growth curve models predicting occupational prestige (N=135,962 person-months, 939 graduates)

	M0	M1	M2	M3	M4	M5
24 months (2 yrs) or less		0.145***	0.145***	0.145***	0.136***	0.136***
		(0.016)	(0.016)	(0.016)	(0.016)	(0.016)
25-48 months (3-4 yrs)		0.028*	0.028*	0.028*	0.025*	0.029*
		(0.012)	(0.012)	(0.012)	(0.012)	(0.012)
49-72 months (5-6 yrs)		0.020	0.020	0.020	0.017	0.024*
		(0.011)	(0.011)	(0.011)	(0.011)	(0.011)
73-96 months (7-8 yrs)		0.041***	0.041***	0.041***	0.037**	0.048***
		(0.012)	(0.012)	(0.012)	(0.012)	(0.012)
97-120 months (9-10 yrs)		0.017	0.017	0.017	0.014	0.024*
		(0.010)	(0.010)	(0.010)	(0.010)	(0.011)
121-144 months (11-12 yrs)		0.013	0.013	0.013	0.011	0.021*
		(0.009)	(0.009)	(0.009)	(0.009)	(0.010)
145-168 months (13-14 yrs)		-0.000	-0.000	-0.000	-0.002	0.007
		(0.010)	(0.010)	(0.010)	(0.010)	(0.010)
Russell Group (ref. Other)			2.400***	1.555*	1.248	1.130
			(0.666)	(0.676)	(0.721)	(0.722)

Intercept	55.055***	50.370***	49.578***	49.632***	52.188***	52.233***
	(0.311)	(0.477)	(0.509)	(1.052)	(2.631)	(2.604)
Controls	-	-	-	Selection	HE charac.	Family form.
Variance components						
Between-individual	90.40	89.48	88.20	84.99	88.95	89.56
Within-individual	41.58	39.16	39.16	39.16	38.67	38.37
Intraclass correlation (rho)	0.68	0.70	0.69	0.69	0.70	0.70
Chi^2	-	156.46	172.50	212.00	251.14	264.72

Robust standard errors in parentheses. *Note:* Estimates for control variables included in Table A3 in the Appendix. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

The empty model provides an estimate for the intraclass correlation coefficient (ICT) indicating to what extent the total variation in occupational prestige is due to differences between graduates rather than within-differences across the career. In this sample, the ICT shows that 68 percent of the overall variance is due to differences in occupational prestige between graduates. Hence, there is rather limited career mobility across graduates' working career, and inequalities seem to emerge at labor market entry.

Model 1 in Table 2 shows that graduates' career progression predominantly takes place in the first two years after they gained their first significant job. The average graduate gains 3.48 (24 x 0.145) SIOPS points across the first two years. In the following four years, career progression slows markedly down (24 x 0.028 + 24 x 0.020 = 1.15 SIOPS points), speeds up again in years six to eight since labor market entry (24 x 0.041 = 0.98 SIOPS points) and is very limited in the last six years of the observation period (24 x 0.017 + 24 x 0.013 + 24 x 0.00 = 0.72 SIOPS points). Overall, graduates gain, on average, 6.33 SIOPS points across 14 years since their first significant job.

The second model shows that graduates from Russell Group universities have, on average, an advantage of 2.40 SIOPS points over graduates from other universities. Adjusting for selection into prestigious universities strongly reduces the estimate to 1.56 SIOPS points in the third model. Accounting for graduate characteristics and family formation across the working career further reduces the estimate but only to a limited extent. As expected, variables addressing selection are more substantive confounders than horizontal HE characteristics or family circumstances when estimating the effect of institutional prestige on occupational prestige. Hence, there is an advantage of graduating from Russell Group universities regarding occupational prestige after adjusting for confounders, but this advantage is rather small (1.13 SIOPS points).

Estimates in Table 2 refer to average careers and do not model career progression by institutional prestige. Table A4 in the appendix shows the estimates from a model, including interaction terms between institutional prestige and the seven 24-month splines. Figure 1 illustrates the predicted growth curves for graduates from Russell Group universities and other universities. The figure shows small differences in occupational prestige between graduates from Russell Group and other universities at labor market entry. This difference becomes slightly stronger across the first two years as graduates from Russell Group universities have steeper growth curves than graduates from other universities. In the following four years, growth curves run in parallel, i.e., occupational prestige differences between both groups remain constant. After six years in the labor market, growth curves are somewhat steeper for graduates from other universities than for graduates from Russell Group universities. At the end of the observation period, there is hardly any difference in occupational prestige between graduates from universities with varying prestige levels.

Figure 1. Predicted occupational prestige by institutional prestige
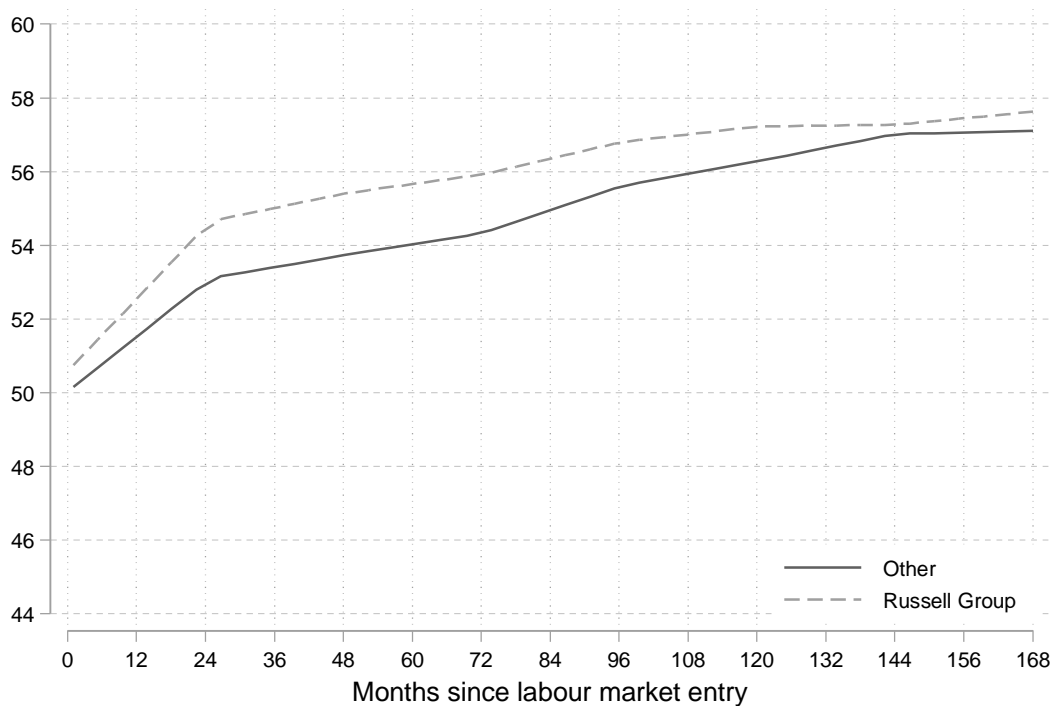
Note: Estimates obtained from growth curve model M6 in Appendix Table A4.

To test the negative vs. positive selection hypothesis, I predict SIOPS scores by institutional prestige and time since labor market entry for graduates whose parents have at least one degree and those whose parents have no degree separately (see full estimates in appendix table A5). Figure 2 illustrates these growth curves. Among graduates whose parents are without a degree, there are no prestige differences by type of university at labor market entry. However, graduates from Russell Group universities have a much steeper growth curve than graduates from other universities in the first two years since their first significant job. Among this group, prestige differences between graduates from Russell Group and other universities are largest after six years in the labor market (more than two SIOPS points). From then onwards, graduates from other universities catch up regarding occupational prestige with their peers from Russell Group universities. At the end of the observation period, there is no difference in occupational prestige by type of university for graduates whose parents do not have a degree.

Figure 2. Predicted occupational prestige by institutional prestige and parental education
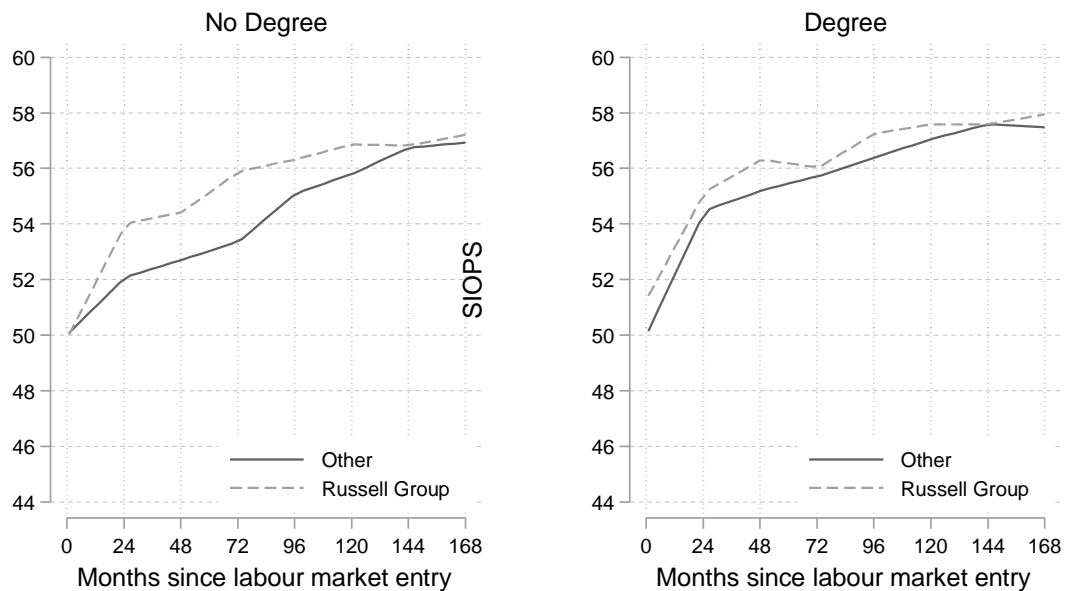
Note: Respective estimates obtained from models 7 and 8 in Appendix Table A5.

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Among graduates whose parents have at least one degree, there is no consistent pattern of occupational prestige differences between graduates from Russell Group and other universities across the observation period. Whereas graduates from Russell Group universities have a small advantage over graduates from other universities at labor market entry, this advantage peaks at four and six years. As with graduates from lower educational backgrounds, graduates from more and less prestigious universities do not differ in occupational prestige after 14 years since labor market entry. Overall, the Russell Group premium is much smaller among graduates whose parents have at least a degree than among graduates whose parents have no degree.

Discussion

The paper analyzed whether graduates from prestigious Russell Group universities gain higher levels of occupational prestige in the labor market compared to graduates from other universities. The article contributes to the literature by following graduates up to 14 years in the labor market since their first significant job, thereby assessing at what stage graduates from prestigious universities have advantages regarding their occupational position and how this Russell Group premium changes across graduates' career. Considering a dynamic and holistic account of graduates' career progression provides further insights into the reasons why (prestigious) educational attainment yields returns in the labor market. Moreover, I investigated whether graduating from prestigious universities pays off more or less for students from different educational backgrounds. Hence, the results inform the debate on the hypothesis of negative vs. positive selection in higher education, i.e., whether those who gain access to prestigious universities the least or the most profit the most from elite education.

The results show that students who have attended a Russell Group university have no advantage at immediate labor market entry. However, they gain higher occupational prestige levels than students from other universities in the first two years since their first significant

job. This small Russell Group premium remains stable until their sixth year in the labor market. The increasing returns to prestigious universities across the early working career are in line with Thomas and Zhang (2005) for the US and studies on Norway (Borgen and Mastekaasa 2018, Borgen 2014) but contradict Ishida et al. (1997) who found that college quality mainly benefits individuals at stages of recruitment in Japan and the US. After six years in the labor market, however, graduates from other universities have a steeper career progression regarding occupational prestige and thus catch up with their peers from Russell Group universities. Hence, in the longer run, there is no Russell Group premium in occupational prestige evident.

When analyzing the career progression of graduates from Russell Group and other universities by parental education, I found evidence for the negative selection hypothesis. Attending Russell Group universities pays off in the early stages of the career only for graduates whose parents did not attain a degree. Graduates from lower educational backgrounds who attended Russell Group universities have a steeper career progression in the first six years since their first significant job than graduates with the same background who attended other universities. Among graduates from higher educational backgrounds, the prestige of the university does not seem to matter regarding their occupational prestige. These results are in line with other studies supporting the negative selection hypothesis for returns to university (Brand and Xie 2010) and returns to prestigious universities in the US (Dale and Krueger 2002; Zhang 2005). However, they are in contrast to Chevalier and Conlon (2003) who did not find variation in the Russell Group premium across the family background, and Borgen (2015) who found evidence for the positive selection hypothesis.

The paper has several important caveats that are worth mentioning when interpreting the results. *First*, the analysis relies on rather small sample size, especially when considering the effect modification by parental education. The British Cohort Study (BCS70) focuses on

all individuals born in a single week in 1970 and does not target graduates in particular. The data, however, have advantages over graduate surveys. Apart from providing the opportunity to follow graduates in the labor market for a longer period, it provides the opportunity to adjust the estimates of institutional prestige with confounders commonly unavailable in graduate surveys (e.g., cognitive ability or locus of control).

Second and related to the first point, the small sample size does not allow me to differentiate prestige levels within the group of Russell Group universities. It may very well be that graduates from Oxbridge and London institutions (also known as the 'golden triangle') have a steeper career progression than graduates from the rest of the Russell Group. Hence, I may underestimate the occupational premium for institutional prestige.

Third and again related to the small sample size, I was not able to investigate whether career trajectories by institutional prestige vary across different fields. Graduating from Russell Group universities may be particularly valuable in fields of study that generally yield lower returns in the labor market. There is, indeed, evidence showing that prestigious institutions are associated with different labor market outcomes depending on the field of study (Borgen and Mastekaasa 2018; Sullivan et al. 2018b; Walker and Zhu 2018).

Fourth, causal interpretations of the Russell Group estimates rest on the unverifiable assumption that there are no (strong) unmeasured confounders. I adjusted the estimates with important confounders such as social origin, type of schooling, or cognitive ability at age 10. Nevertheless, students graduating from universities with different levels of prestige may differ in significant dimensions not addressed in the analysis. For instance, students attending prestigious universities may be more ambitious than students attending other universities, and measures of students' ambitions are absent in my study.

Fifth, the paper is limited to statements on institutional prestige regarding occupational positions and does not consider within-occupation changes in returns by the

prestige of graduates' university. Career trajectories for graduates from Russell Group and other universities may be different from what I observe in the present analysis when using wages. Wages may be less prone to ceiling effects than occupational outcomes when focusing on a sample of graduates.

Assuming that these caveats are not pivotal, the results provide neither evidence for the signaling theory nor the human capital theory. Since graduates from Russell Group universities do not have advantages over other graduates in their first significant job, employers do not seem to rely on institutional quality as a screening device when they lack information about graduates' real productivity. The findings are also at odds with the predictions of human capital theory because the increasing Russell Wage premium across the early working career does not persist in later stages. If graduating from prestigious universities increases individuals' productivity, employers learn about their productivity when graduates gain work experience and should reward them at any stage of their working life. The non-existence of a Russell Group Premium in later stages of the career also speaks against the idea that graduates from Russell Group universities sort into initial jobs with better long-term occupational trajectories.

It appears that advantages of graduates from Russel Group universities regarding occupational prestige are limited to the early occupational career. Graduates from other universities can catch up quickly with graduates from prestigious universities and achieve the same levels of occupational prestige. The early Russell Group premium is limited to first-generation graduates providing support for the negative selection hypothesis. Graduates from higher educational backgrounds have similar occupational trajectories irrespective of whether they graduate from prestigious universities or not. First-generation graduates can only compete with graduates from advantaged backgrounds in the initial stages of the career if they attended a Russell Group university. This suggests that disadvantages of first-generation

students from other universities are due to resources, e.g., social networks or opportunity structures, e.g., managerial and professional job opportunities in the geographical area, that are restricted without elite education. Nevertheless, first-generation students from other universities catch up with graduates from prestigious universities regarding occupational positions across the working career. It just takes them longer to achieve the same occupational prestige as their peers with an elite education.

Evidence for the negative selection hypothesis – at least in the early occupational career – suggests that similar to a degree (Karlson 2019; Torche 2011), prestigious university education has the power to foster intergenerational social mobility. Students whose parents do not have a degree and who are least likely to go to prestigious universities profit the most from it regarding occupational positions and, as such, are less disadvantaged compared to students from higher educational backgrounds than their peers at less prestigious universities. Hence, widening access to prestigious universities for students from disadvantaged backgrounds may be an effective way of improving intergenerational fluidity in the UK.

Future research needs to replicate these results on institutional prestige and career progression with larger graduate samples and different outcomes, for instance, wages. Furthermore, the present paper was unable to disentangle the possible explanations for the negative selection hypothesis, i.e., why graduating from Russell Group universities pays off for graduates from lower educational backgrounds only. It remains open to future research to test potential mechanisms for the career patterns I observed.

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Appendix

Table A1. Summary of model for estimating the denominator of attrition weight (logistic regression)

	Denominator Attrition weight
Cognitive ability (standardized) at age 10	-.020***
	(.002)
Locus of control (standardized) at age 10	.023
	(.024)
At least one parent with a degree (ref. both parents with no degree)	-.027
	(.072)
Ethnic origin (ref. English/Northern Irish)	
Welsh	.083
	(.094)
Scottish	.405***
	(.069)
European	.261
	(.249)
Indian/Pakistani/Bangladeshi	.126
	(.140)
Other	.782
	(.511)
Class of origin (ref. higher managerial and professional occupations)	
Lower managerial and professional occupations	-.053
	(.088)
Intermediate occupations	.083
	(.092)
Small employers and account workers	.027
	(.104)
Lower supervisory and technical occupations	.157
	(.098)
Semi-routine occupations	.240*
	(.094)
Routine occupations	.250*
	(.099)
Constant	1.229***
	(.195)
N	9232

Standard errors in parentheses, $^{*} p < 0.05$, $^{**} p < 0.01$, $^{***} p < 0.001$

Table A2. Descriptive statistics for inverse probability of attrition weight (AW)

		Percentiles			
M	*SD*	*1st*	*25th*	*75th*	*99th*
1.00	0.13	0.80	0.90	1.07	1.41

Note: Statistics pertain to sample not lost to follow-up.

Table A3. Summary of growth curve models predicting occupational prestige (N=135,962 Person-months; 939 Graduates)

	M0	M1	M2	M3	M4	M5
24 months (2 yrs) or less		0.145***	0.145***	0.145***	0.136***	0.136***
		(0.016)	(0.016)	(0.016)	(0.016)	(0.016)
25-48 months (3-4 yrs)		0.028*	0.028*	0.028*	0.025*	0.029*
		(0.012)	(0.012)	(0.012)	(0.012)	(0.012)
49-72 months (5-6 yrs)		0.020	0.020	0.020	0.017	0.024*
		(0.011)	(0.011)	(0.011)	(0.011)	(0.011)
73-96 months (7-8 yrs)		0.041***	0.041***	0.041***	0.037**	0.048***
		(0.012)	(0.012)	(0.012)	(0.012)	(0.012)
97-120 months (9-10 yrs)		0.017	0.017	0.017	0.014	0.024*
		(0.010)	(0.010)	(0.010)	(0.010)	(0.011)
121-144 months (11-12 yrs)		0.013	0.013	0.013	0.011	0.021*
		(0.009)	(0.009)	(0.009)	(0.009)	(0.010)
145-168 months (13-14 yrs)		-0.000	-0.000	-0.000	-0.002	0.007
		(0.010)	(0.010)	(0.010)	(0.010)	(0.010)
Russell Group (ref. Other)			2.400***	1.555*	1.248	1.130
			(0.666)	(0.676)	(0.721)	(0.722)
Female (ref. male)				-1.262*	-1.109	-0.815
				(0.614)	(0.833)	(0.833)
Non-UK origin (ref. UK)				-0.371	-0.877	-0.877
				(1.567)	(1.615)	(1.636)

At least one parent with a degree (ref. both parents with no degree)	0.718	0.222	0.176
	(0.713)	(0.752)	(0.755)
Parental class (ref. Salariat class)			
Intermediate class	0.471	0.304	0.422
	(0.778)	(0.803)	(0.805)
Working class	-0.203	0.495	0.523
	(1.062)	(1.184)	(1.185)
Cognitive ability	0.075**	0.067*	0.065*
	(0.027)	(0.030)	(0.030)
Locus of control	-0.019	-0.250	-0.206
	(0.355)	(0.380)	(0.382)
Secondary school qualifications (ref. no A-level)			
1 A-level	0.160	-0.374	-0.666
	(1.126)	(1.240)	(1.240)
2+ A-levels	-0.062	-0.157	-0.524
	(0.842)	(0.926)	(0.935)
Secondary school type (ref. Comprehensive)			
Grammar	-0.464	-0.755	-0.583
	(1.067)	(1.078)	(1.079)
Secondary Modern	0.150	-0.234	-0.212

	(0.887)	(1.160)	(1.164)
Independent	3.376***	3.165**	3.157**
	(0.963)	(0.971)	(0.978)
Postgraduate (ref. undergraduate)		5.253***	5.095***
		(1.385)	(1.388)
Field of study (ref. humanities)			
Social sciences		2.480	2.236
		(1.848)	(1.858)
STEM fields		-0.010	-0.203
		(1.810)	(1.798)
Class of degree (ref. 1st)			
2:1		-1.450	-0.725
		(2.819)	(2.813)
2:2		-7.999**	-7.564**
		(2.968)	(2.882)
Third or pass		0.068	0.328
		(2.176)	(2.181)
Part-time studies (ref. full-time studies)		-1.588	-1.189
		(2.037)	(2.033)
Marital status (ref. Single)			
Married			-0.245

	(1)	(2)	(3)	(4)	(5)	(6)
						(0.387)
Divorced						-2.382[*]
						(1.194)
N children						-0.626[*]
						(0.256)
Part-time employment (ref. full-time)						-1.707[*]
						(0.808)
Intercept	55.055[***]	50.370[***]	49.578[***]	49.632[***]	52.188[***]	52.233[***]
	(0.311)	(0.477)	(0.509)	(1.052)	(2.631)	(2.604)
Variance components						
Between-individual	90.40	89.48	88.20	84.99	88.95	89.56
Within-individual	41.58	39.16	39.16	39.16	38.67	38.37
Intraclass correlation (rho)	0.68	0.70	0.69	0.69	0.70	0.70
Chi^2	-	156.46	172.50	212.00	251.14	264.72

Robust standard errors in parentheses. [*] $p < 0.05$, [**] $p < 0.01$, [***] $p < 0.001$.

Table A4. Growth curve models predicting occupational prestige by institutional prestige *(N=135,962 person-months from 939 graduates)*

	M6
24 months (2 yrs) or less	0.124***
	(0.019)
25-48 months (3-4 yrs)	0.027
	(0.015)
49-72 months (5-6 yrs)	0.025
	(0.014)
73-96 months (7-8 yrs)	0.053***
	(0.015)
97-120 months (9-10 yrs)	0.028*
	(0.013)
121-144 months (11-12 yrs)	0.031**
	(0.011)
145-168 months (13-14 yrs)	0.004
	(0.013)
Russell Group (ref. Other)	0.545
	(1.050)
Female (ref. male)	-0.811
	(0.834)
Non-UK origin (ref. UK)	-0.871
	(1.635)
At least one parent with a degree (ref. both parents with no degree)	0.183
	(0.754)
Parental class (ref. Salariat class)	
Intermediate class	0.432
	(0.804)
Working class	0.537
	(1.184)
Cognitive ability	0.066*
	(0.030)
Locus of control	-0.204
	(0.381)
Secondary school qualifications (ref. no	

A-level)

1 A-level	-0.680
	(1.240)
2+ A-levels	-0.536
	(0.936)
Secondary school type (ref. Comprehensive)	
Grammar	-0.568
	(1.078)
Secondary Modern	-0.208
	(1.161)
Independent	3.163**
	(0.977)
Postgraduate (ref. undergraduate)	5.124***
	(1.396)
Field of study (ref. humanities)	
Social sciences	2.251
	(1.829)
STEM fields	-0.143
	(1.793)
Class of degree (ref. 1st)	
2:1	-0.621
	(2.802)
2:2	-7.439**
	(2.869)
Third or pass	0.340
	(2.141)
Part-time studies (ref. full-time studies)	-1.160
	(2.032)
Marital status (ref. Single)	
Married	-0.228
	(0.387)
Divorced	-2.363*
	(1.197)
N children	-0.645*

	(0.255)
Part-time employment (ref. full-time)	-1.703*
	(0.807)
Russell Group*24 months	0.040
	(0.033)
Russell Group*25-48 months	0.005
	(0.024)
Russell Group*49-72 months	-0.003
	(0.022)
Russell Group*73-96 months	-0.016
	(0.025)
Russell Group*97-120 months	-0.011
	(0.022)
Russell Group*121-144 months	-0.029
	(0.019)
Russell Group*145-168 months	0.011
	(0.021)
Intercept	52.298***
	(2.591)
Variance components	
Between-individual	89.47
Within-individual	38.32
Intraclass correlation (rho)	0.70
Chi^2	276.69

Robust standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p <$ 0.001.

Table A5. Growth curve models predicting occupational prestige by institutional prestige for graduates whose parents have no degree (N=71,721 person-months from 501 graduates) and whose parents have at least one degree (N=64,241 person-months from 438 graduates)

	M7 (Parents with no degree)	M8 (Parents with at least one degree)
24 months (2 yrs) or less	0.084***	0.182***
	(0.022)	(0.033)
25-48 months (3-4 yrs)	0.026	0.030
	(0.019)	(0.024)
49-72 months (5-6 yrs)	0.027	0.022
	(0.018)	(0.021)
73-96 months (7-8 yrs)	0.073***	0.028
	(0.021)	(0.022)
97-120 months (9-10 yrs)	0.029	0.028
	(0.018)	(0.017)
121-144 months (11-12 yrs)	0.039**	0.022
	(0.015)	(0.017)
145-168 months (13-14 yrs)	0.008	-0.004
	(0.018)	(0.017)
Russell Group (ref. Other)	-0.158	1.282
	(1.385)	(1.594)
Female (ref. male)	-1.315	-1.146
	(1.370)	(1.076)
Non-UK origin (ref. UK)	0.269	-2.150
	(2.084)	(2.336)
Parental class (ref. Salariat class)		
Intermediate class	0.035	1.668
	(1.012)	(1.436)
Working class	0.785	-1.865
	(1.380)	(3.385)
Cognitive ability	0.089*	0.051
	(0.042)	(0.044)
Locus of control	-0.240	0.078
	(0.528)	(0.579)
Secondary school qualifications (ref. no A-level)		

1 A-level	-1.734	0.906
	(1.591)	(2.068)
2+ A-levels	-0.504	-0.453
	(1.206)	(1.591)
Secondary school type (ref. Comprehensive)		
Grammar	-0.414	-1.086
	(1.663)	(1.499)
Secondary Modern	0.150	-1.732
	(1.200)	(2.745)
Independent	3.187*	3.807**
	(1.592)	(1.358)
Postgraduate (ref. undergraduate)	5.621*	
	(2.362)	
Field of study (ref. humanities)		
Social sciences	-1.062	3.578
	(2.946)	(2.271)
STEM fields	-4.667	2.452
	(2.660)	(2.440)
Class of degree (ref. 1st)		
2:1	1.097	-2.605
	(5.764)	(3.375)
2:2	-4.227	-11.387**
	(4.337)	(3.490)
Third or pass	2.391	-2.051
	(3.605)	(2.374)
Part-time studies (ref. full-time studies)	1.849	-4.042*
	(3.693)	(1.945)
Marital status (ref. Single)		
Married	-0.132	-0.358
	(0.511)	(0.585)
Divorced	-3.866*	-0.106
	(1.701)	(1.310)
N children	-0.790*	-0.503
	(0.341)	(0.376)

Part-time employment (ref. full-time)	-2.908**	-0.508
	(1.101)	(1.152)
Russell Group*24 months	0.083*	-0.025
	(0.042)	(0.051)
Russell Group*25-48 months	-0.008	0.019
	(0.029)	(0.038)
Russell Group*49-72 months	0.034	-0.034
	(0.034)	(0.030)
Russell Group*73-96 months	-0.055	0.024
	(0.035)	(0.035)
Russell Group*97-120 months	-0.007	-0.015
	(0.026)	(0.033)
Russell Group*121-144 months	-0.041	-0.022
	(0.025)	(0.029)
Russell Group*145-168 months	0.009	0.020
	(0.031)	(0.029)
Intercept	52.298***	52.683***
	(2.591)	(3.752)
Variance components		
Between-individual	91.55	91.92
Within-individual	36.46	39.92
Intraclass correlation (rho)	0.72	0.70
Chi^2	180.85	152.93

Robust standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.