

Socio-economic Inequalities in Access to Elite Occupations

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PhD Economics of Education

Declaration

I, Claire Tyler, confirm that the work presented in this thesis is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.

Abstract

This thesis explores socio-economic inequalities in access to ‘elite’ professional or managerial occupations in the UK with a particular focus on inequalities in ‘non-educational’ attributes. Social gradients in educational attainment are often the primary focus when explaining barriers to elite occupations, however they are unable to fully explain socio-economic gaps in access. This thesis therefore extends the study of access to elite occupations, by moving beyond educational attainment to consider a range of other barriers which are widely discussed in academic and policy circles but are under-researched quantitatively.

The findings provide new empirical evidence on the importance of social capital (in the form of relevant personal networks and work experience which influence career choice), non-cognitive skills (often termed soft skills or personality traits) and career self-management (such as career aspirations, promotion- or challenge-seeking values, work experience, commercial awareness and the use of networks for educational or career guidance) for gaining access to elite occupations and creating barriers to these careers for young people from less advantaged backgrounds.

The thesis also makes several other contributions. It empirically shows how social background and gender intersect to provide a large ‘triple advantage’ for males from higher socio-economic backgrounds over females from lower socio-economic backgrounds when accessing elite careers. Methodologically it shows the benefit of analysing elite occupational outcomes over multiple waves of survey data rather than a single mid-career snapshot which is common in related literature but underestimates levels of access to elite occupations as it conflates access (whether individuals enter these careers) and retention (whether they remain in these careers). It also demonstrates the significant research value of using newly available recruitment data from employers to disentangle the role of aspirations (who applies) and recruitment processes (who is rejected by employers) in driving inequalities in access to elite occupations.

Impact Statement

The ideas in this thesis have been put to beneficial use in several ways to date and will hopefully continue to create further impact in future.

The main impact of the work undertaken during my PhD is the creation of research collaborations between UCL and large graduate employers to improve access to elite occupations for young people from less privileged backgrounds. Since 2015, I have been working with Lindsey Macmillan and Catherine Dilnot to negotiate access to individual-level applicant data from two of the largest UK graduate employers. This type of data can shed light on improvements needed in the recruitment practices of elite firms, however it has previously been unavailable to researchers. We firstly advised the firms on expanding the social background data collected by their application forms, such as capturing parental occupation and identifying academically selective school applicants separately. We subsequently produced regular annual reports outlining the socio-economic (and gender and ethnic) diversity of applicant pools compared to national benchmarks and revealed how diversity changes during the recruitment process. This ultimately showed which applicants are most and least likely to obtain job offers even when they are equally academically qualified for the role. We presented our findings to recruitment teams at the firms who found this analysis invaluable when reviewing their recruitment processes (testimonials from these firms are included in Appendix 6.0). The recruitment data from one of these employers is used for Chapter 4 in this thesis to explore the role of social capital in graduate recruitment.

The ideas in this thesis also contributed to a successful funding bid to the Nuffield Foundation to expand this project for a further three years (2022-2025). This will allow us to collaborate with around ten more large graduate employers and extend the analysis of how work experience and networks create barriers to elite occupations (from Chapter 4) across more employers and industries. We will additionally incorporate analysis of how socio-economic background, gender and ethnicity intersect to influence the chances of obtaining job offers in elite organisations (extending the findings from Chapter 3 of this thesis). The overall findings feed into employer guidance of ‘what works’ for social mobility via bodies such as the Social Mobility Commission, Social Mobility Foundation and The Sutton Trust, delivering impact beyond participating firms by increasing the visibility of the need to collect social background data and change application processes. In future, we plan to extend the analysis to explore inequalities in career progression, such

as performance ratings, pay and promotions, using workforce data from large employers (we have already started this with one firm).

The findings from this thesis have also been communicated to other academic and policy audiences. Chapter 1 was published as a jointly authored academic paper in *The Journal of Social Policy* (as Macmillan, Tyler & Vignoles, 2015) also obtaining mainstream press coverage (including *The Independent* and *The Observer*). The findings from Chapter 2 were included in a joint report to the Early Intervention Foundation (EIF) on the importance of social and emotional skills (as Goodman, Joshi, Nasim & Tyler, 2015). The EIF partnered with the Cabinet Office and the Social Mobility and Child Poverty Commission to commission the report.

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Introduction

1. Why study socioeconomic inequalities in access to elite occupations?

This thesis explores socio-economic inequalities in access to ‘elite’ occupations in the UK with a particular focus on inequalities related to ‘non-educational’ attributes. These occupations comprise higher managerial and professional occupations which usually offer better long-term earnings prospects, more autonomy and greater economic security and stability than other occupations (Goldthorpe & McKnight, 2006). They are also crucial to the UK economy, representing almost a third of all jobs (UKCES, 2016), including positions of power and influence in society such as senior roles in politics, law, business and media (The Sutton Trust, 2019). As such, understanding and reducing socio-economic barriers to elite occupations promotes equality of opportunity for all.

As the UK performs poorly internationally with high income inequality and low social mobility (Corak, 2013, Jerrim and Macmillan, 2015, OECD 2010 & 2015), weakening the relationship between the socio-economic status of one generation and the next is a key priority for the UK government. The rationale for promoting greater social mobility, which includes equalising access to elite occupations, is often framed in terms of economic, social and moral arguments. The economic arguments for social mobility rest on the measurable benefits of improving the allocation of talents and skills within the labour market. At an individual employer level, the recent rise of the business case for diversity suggests that diverse workforces drive profitability, innovation and better decision making (McKinsey 2014, 2018, 2020; BCG, 2017; Nathan & Lee, 2013; Herring, 2009; Galinsky et al., 2015) and attract higher quality workforces as employees increasingly aspire to work for companies with a strong commitment to diversity (Bright Network, 2021). As such, the majority of the UK’s top graduate employers rank achieving their social mobility (and gender and ethnicity) targets to be a very high priority (High Fliers, 2020). At a national level, recent evidence suggests greater social mobility, in the form of reduced socio-economic barriers to educational attainment and declining workplace discrimination, drives economic growth (Hsieh et al., 2019). For example, reducing inequalities in educational attainment to drive social mobility could add between £56 billion and £140 billion to UK GDP each year by 2050 (The Sutton Trust, 2010). Furthermore, social arguments for social mobility extend beyond financial imperatives to promote benefits for social cohesion (OECD 2012), health and wellbeing (Public Health England, 2018; JRF 2014) and crime (Mok et al., 2018).

In contrast, moral arguments for social mobility are founded on ideas of equity, meritocracy and social justice arguing that reducing socio-economic barriers to elite occupations is simply ‘the right thing to do’ regardless of the existence of quantifiable benefits. In fact, although business cases can be powerful drivers of diversity and inclusion initiatives within industry, relying on such evidence makes the rationale for social mobility ‘economically contingent’ and therefore ‘morally dubious’ (Ashley & Empson, 2013). For example, Noon (2007) argues that ‘the argument for the moral case based on the human rights of all employees and job seekers must not be abandoned for the current fashion of diversity and the business case’. Furthermore, the popular narrative that diversity profiles of businesses should reflect the communities they serve is especially pertinent for traditional professions such as law, medicine and accountancy with long established public service duties to maintain a justice system, provide healthcare and safeguard the economy.

Widening access to elite occupations has therefore been a long-running focus of the UK government’s social mobility policy. However, access to and progression within these high-status careers remains socially exclusive. For example, 74% of medical professionals, 64% of journalists and lawyers; and 89% of senior financial services professionals originate from professional or managerial backgrounds compared to 33% of the population (Friedman & Laurison, 2020; Bridge Group, 2020b) and two-fifths of Britain’s ‘leading people’ attended independent schools compared to 7% of the population (Sutton Trust, 2019). Overall, people from more privileged backgrounds are 80% more likely to enter professional careers than their less advantaged peers (SMC, 2019, pp 105).

2. Policy and industry context

This thesis was undertaken during a period of considerable change for social mobility policy in the UK alongside increasing awareness in industry of social background as a potential form of labour market disadvantage. The specific issue of socio-economic barriers to elite occupations first rose to prominence in policy circles in the mid-2000s (Langlands 2005, Cabinet Office, 2009) with the creation of the ‘Panel on Fair Access to the Professions’, closely followed by the formation of the Social Mobility (and Child Poverty) Commission and publication of regular reports outlining key social mobility issues (starting with Cabinet Office (2011, 2012) up to SMC (2022) more recently). This has promoted the need for socio-economic disadvantage to be considered alongside other

protected characteristics in the workplace such as gender and ethnicity which are regularly the subject of government reviews¹ and policies. For example, mandatory gender pay gap reporting was introduced in 2017 and mandatory ethnicity pay gap reporting is on the horizon².

In industry, the growth of diversity and inclusion agendas alongside a focus on more responsible and sustainable business practices (such as ESG³) has raised the profile of socio-economic diversity in recruitment, promotion and retention policies. Developments have included the introduction of the Social Mobility Employer Index in 2017 (e.g. SMF, 2021), which encourages firms to become more accessible to lower socio-economic status (SES) individuals; the introduction of government guidance for firms to collect and analyse social background data of successful and unsuccessful job applicants (e.g. SMC, 2021a); increasing use of contextual data to assess candidate potential based on their individual socio-economic circumstances (e.g. Rare Recruitment⁴) and increasing discussion of ‘class pay gaps’ (Laurison & Friedman, 2016; SMF, 2022). However, there is more progress yet to be made. For example, there are calls to enhance the status of socio-economic rights in the UK, including designating social background a protected characteristic (e.g. SMC 2021b) and enacting Section 1 of the Equality Act 2010 in UK law (the duty of public sector bodies to address SES inequalities) (e.g. EHRC, 2018, pp21). Also, by 2021, two-thirds of the firms who submitted an entry to the Social Mobility Index are not collecting full SES data from their applicants (SMF, 2021, pp13), and although some firms with leading diversity and inclusion strategies have begun to publish the socio-economic pay gaps of their workforce (e.g. PWC, 2021), this is far from the norm. Using data to monitor and reduce socio-economic gaps in recruitment is therefore a new approach for the majority of elite organisations.

3. *The role of education in the reproduction of elite occupational status*

This thesis aims to provide new quantitative evidence on factors which may drive SES inequalities in access to elite occupations. The starting point is the widely acknowledged

¹ For gender see Hampton-Alexander (2017), Davies (2015), Government Equalities Office (2016) and APPG (2019) and for ethnicity see McGregor-Smith (2017), BEIS (2019) and Parker (2022).

² Ethnicity pay gap reporting is currently published on a voluntary basis. The government consultation on mandatory ethnicity pay gap reporting closed in January 2019.

³ ESG stands for Environmental, Social and Governance - the three pillars of responsible and sustainable business practices. Socioeconomic inequalities in occupational outcomes fall into the categories of ‘Social’ (such as HR policies around diversity and inclusion in hiring and promotions, and employee wellbeing) and ‘Governance’ (such as board diversity).

⁴ <https://www.rarerecruitment.co.uk/>

role that socio-economic inequalities in educational attainment play in driving inequalities in labour market outcomes. Human capital and returns to education literature in economics have long demonstrated that greater and better investments in children's education made by wealthier parents provide additional wage returns in the labour market in adulthood (Becker, 1962; Mincer, 1974; Becker & Tomes, 1986; Hungerford and Solon, 1987; Spence 1973, Bowles & Gintis, 2002, Card, 1999; Harmon et al., 2000; Solon, 2004; Dickson and Smith, 2011; Heckman & Mosso, 2014; Gregg, Macmillan & Vittori, 2019; Becker et al., 2018). Similarly, sociologists have long recognised the role of education in occupational mobility (Duncan and Hodge 1963; Blau and Duncan, 1967). Demonstrating excellent academic achievement is particularly crucial for aspiring managers and professionals who are recruited in the 'war for talent', through competitive multi-stage recruitment processes with high academic requirements (Duff, 2017; Sullivan et al., 2018a & b; Brown & Hesketh, 2004). Social gradients in the educational attainment of students (Feinstein, 2003; Crawford, Macmillan & Vignoles, 2017; Jerrim & Vignoles, 2015) are therefore often the primary focus when explaining the lack of SES diversity in elite occupations (Gugushvilli, Bukodi & Goldthorpe, 2017; Bukodi & Goldthorpe, 2011b; Blanden, Gregg & Macmillan, 2007; Macmillan, Tyler & Vignoles, 2015, Sullivan et al., 2018a; Britton et al., 2019; Ashley 2022b; Macmillan, Gregg & Vittori, 2019).

In the UK education system, early SES gradients in educational attainment are exacerbated by the role of educational institutions. For example, the popularity of private and grammar schools further drives inequalities in access to elite occupations. Compared to state school pupils, private school pupils are more likely to obtain a university degree, especially from an elite institution (Sullivan et al., 2014); enter high status jobs (Sutton Trust 2005, 2010; Macmillan, Tyler, Vignoles, 2015; Sullivan et al., 2018; Green & Kynaston, 2019; Green et al., 2020; Green, 2022) and be paid more (Crawford & Vignoles, 2014; Green et al., 2012, Green, Henseke & Vignoles, 2017; Green et al., 2018). Grammar schools have also been shown to attract more advantaged students irrespective of ability (Jerrim & Sims, 2020; Burgess, Crawford & Macmillan, 2018) and increase earnings inequality in adulthood (Burgess, Dickson, & Macmillan, 2020). Stratification in the UK university system further widens the access gap to elite occupations as selection into high-status institutions reflects social background (Sullivan et al., 2014; Crawford et al., 2016; Boliver, 2013) and elite employers recruit from a hierarchy of institutions (Donnelly & Gamsu, 2019; Sullivan et al., 2018b; Wakeling & Savage, 2015). Children

from higher SES backgrounds therefore accumulate a portfolio of educational advantages from birth which provide better chances of accessing elite occupations in adulthood.

4. *Going beyond educational inequalities*

Even after accounting for wide ranging SES differences in educational outcomes, social mobility research empirically shows that social background remains a predictor of access to elite occupations (Bukodi & Goldthorpe, 2011b; Laurison & Friedman, 2016; Friedman, Laurison & Macmillan, 2017; Friedman & Laurison, 2020; Friedman, Laurison & Miles, 2015; Macmillan, 2009; Sullivan et al., 2018a & b; McKnight, 2015; Gugushvilli, Bukodi & Goldthorpe, 2017) and that income persistence is particularly strong among top earners (Gregg, Macmillan & Vittori, 2019). As such, the thesis is motivated by the need to better understand why socio-economic barriers to elite occupations persist amongst individuals who have comparable levels of educational attainment. This understanding is necessary to inform government social mobility policies and employer recruitment practices and to ultimately create more diverse and inclusive workplaces for young people entering the workforce today.

Several fields of literature offer additional theories about why elite occupational status⁵ may be transmitted particularly readily between generations. Extensions to human capital literature recognise the potential labour market value of a range of non-cognitive attributes (Bowles, Gintis & Osborne, 2001; Osborne-Groves, 2005; Jackson, 2006; Heckman, Stixrud & Urzua, 2006; Green, Henseke & Vignoles, 2017) which are increasingly being demanded by elite employers and identified using ever more sophisticated psychometric tests and assessment centres (Green et al., 2018; Ashley et al., 2015), however display significant variation by social background from a young age (Cattan et al., 2022; Feinstein, 2000). In sociology, parental behaviours such as concerted cultivation (Lareau, 2011), opportunity hoarding (Tilly, 1998) and anticipatory socialisation into professional careers (Merton, 1968; Gebreiter, 2020) act to maintain the elite occupational position of children from wealthier families, often by building valuable social and cultural capital (Ashley & Empson, 2017; Ashley & Empson, 2013; Reeves & de Vries, 2019; Reeves et al., 2017; Rivera, 2012; Jacobs, 2003; Cook, Faulconbridge &

⁵ This thesis focuses specifically on occupational elites rather than other definitions of elites used elsewhere such as the ‘financial elite’ representing the extremely wealthy (e.g. the top 1%); the ‘power or governing elites’ or ‘institutional elites’ (Hecht et al, 2020). However, there is clearly overlap between these definitions.

Muzio, 2012; Duff, 2017, Bourdieu, 1986; Ashley, 2022a). Related research also describes how working-class students prioritise educational achievement, often to the exclusion of extra-curricular activities or ‘playing the game’ thereby limiting employment opportunities (Bathmaker et al., 2013). In human resources and recruitment literature, a myriad of family-level behaviours limits downward mobility by preparing young people to demonstrate their superior ‘fit’ or ‘match’ with future elite employers who often favour attributes which are socially graded, which represents a form of occupational closure (Cook, Faulconbridge & Muzio, 2012; Rivera, 2012; Handley, 2017). This range of theories therefore reflects the broadening of elite employers’ definitions of ‘merit’ beyond educational credentials, often rewarding a more nebulous notion of ‘job readiness’ (Brown & Souto-Otero, 2020; Jackson, 2007). By recruiting for these apparently meritocratic characteristics, elite employers are therefore able to defend exclusion on the basis of socio-economic background (Ashley, 2022b) and maintain a hierarchy of privilege (Littler, 2017; Ingram and Allen, 2019; Mijs & Savage, 2020). Within this rich research context, this thesis aims to provide new quantitative evidence on the role of a range of ‘non-educational’ factors which may drive SES inequalities in access to elite occupations.

5. Thesis contribution and structure

The four papers contained in this thesis (Chapters 1 to 4) contribute new empirical evidence to the ongoing academic and policy debates about why socio-economic inequalities to elite occupations continue to exist in the UK. Given the persistent inequalities in educational outcomes in the UK and the well-documented importance of education for labour market outcomes (as both previously outlined) the analysis presented naturally incorporates the crucial role of human capital (in the form of educational attainment) in generating elite occupational outcomes. However, the main contribution of the thesis is to extend the analysis beyond educational attainment to provide quantitative evidence on the potential role of ‘non-educational’ attributes in driving socio-economic inequalities in access to elite occupations. These attributes are widely discussed in academic and policy circles as being potential barriers to elite careers for individuals from less advantaged backgrounds (e.g. Ashley et al., 2015; Wright & Mulvey, 2021; Roberts 2017; Total Jobs & SMF, 2021; Sutton Trust 2018a & b; Tholen et al., 2013; Abrahams; 2017; BDO, 2022), however their importance in the elite labour market is currently under-researched quantitatively. Specifically, motivated by theoretical perspectives in economics, sociology and human resources (as previously outlined), this

this thesis explores empirically whether socio-economic inequalities in access to elite occupations may be driven not only by educational attainment, but also by inequalities in other attributes such as social capital (in the form of personal networks and work experience which influence career choice); non-cognitive skills (often termed soft skills or personality traits) and career self-management (such as career aspirations, promotion- or challenge-seeking values, work experience, commercial awareness and the use of networks for educational or career guidance).

The thesis also makes several other contributions which provide further new insights into SES barriers to elite occupations. For example, it explores the importance of intersectionality, specifically the ways in which SES intersects with gender to favour males from more advantaged backgrounds in the elite labour market. Furthermore, the thesis not only analyses longitudinal data, which captures social origins and occupational outcomes, but also delves more deeply into newly available employer data which additionally captures individuals who apply for elite careers and reveals their chances of receiving a job offer relative to their peers. This is a useful step in beginning to untangle the role of individual choice (selection into elite careers) and employer bias (in recruitment processes) in explaining SES inequalities in access to elite occupations.

The thesis is structured as follows:

Chapter 1 is a jointly authored paper with Lindsey Macmillan and Anna Vignoles which explores the role of family background and networks in access to elite occupations using data on UK graduates from the Destinations of Leavers from Higher Education (DLHE) surveys. This paper firstly addresses the question of whether family background (as measured by parental occupation, neighbourhood higher education participation and school type) predicts early access to higher managerial and professional occupations (3.5 years after graduation), even when accounting for SES differences in educational attainment. It secondly assesses whether the use of personal and professional networks for job search can explain the remaining socio-economic gap in access to these elite occupations. Its main contribution is to show quantitatively that use of networks is associated with greater access to elite occupations, but that use of networks is unable to explain remaining gaps in access to these careers between similarly academically qualified individuals from private and state schools.

Chapter 2 explores the role of childhood cognitive and non-cognitive skills in creating barriers to elite occupations for individuals from lower socio-economic (SES)

backgrounds over the first half of their careers (age 26-42) using data from the 1970 British Cohort Study (BCS). This paper contributes to related literature in several ways. It estimates the relative importance of specific childhood skills in explaining SES gaps in access to elite occupations and provides new evidence of the routes through which these skills influence access to elite occupations, identifying ‘career self-management’ (such as career aspirations, use of networks and work experience) as an important facilitator in addition to educational attainment. Methodologically it also demonstrates the value of analysing elite occupational outcomes over multiple waves of survey data rather than relying on a single mid-career snapshot which is common in related literature but underestimates levels of access to elite occupations as it conflates issues of access (whether individuals enter these careers) and retention (whether they remain in these careers).

Chapter 3 considers how socio-economic gaps in access to elite occupations may vary by gender (using the same BCS70 dataset and sample as Chapter 3). This paper provides new evidence that SES and gender intersect to provide a large ‘triple advantage’ for sons from elite backgrounds compared to daughters from non-elite backgrounds when accessing elite occupations during the first half of their career (age 26-42). The analysis also contributes to related literature by exploring the puzzle of why sons from elite backgrounds have the highest rate of access to elite occupations despite not being the highest attaining group academically at school and undergraduate degree level (as this is usually daughters from elite backgrounds).

Chapter 4 explores the role of social capital (in the form personal and professional networks, including work experience) in graduate recruitment in one specific elite sector, the UK Professional Services industry. This sector offers popular entry-level pathways to graduate careers in finance, banking, accountancy, consultancy and law. The paper uses newly available individual-level data from applicants to a UK graduate scheme at a large global professional services firm (PSF). It provides new quantitative evidence of the influence of graduate’s social capital on their chances of obtaining entry level job offers, even in formalised recruitment processes, and over and above their educational credentials. The analysis also reveals where in the recruitment process these networks matter most, who appears to benefit most from networks and the implications for social mobility into these careers.

The thesis concludes with a summary of the key findings, a discussion of the implications for policy makers and employers and suggested avenues for future research.

Chapter 1**Who Gets the Top Jobs? The Role of Family Background and Networks in Recent Graduates' Access to High-status Professions**

Lindsey Macmillan, Claire Tyler and Anna Vignoles

This is a jointly authored paper with Lindsey Macmillan and Anna Vignoles which was published in the Journal of Social Policy in July 2015. Please refer to the UCL Research Paper Declaration Form included in this thesis for further information.

Abstract

There is currently debate in policy circles about access to ‘the upper echelons of power’ (Sir John Major, ex-Prime Minister, 2013). This research explores the relationship between family background and early access to top occupations. We find that privately educated graduates are a third more likely to enter into high-status occupations than state educated graduates from similarly affluent families and neighbourhoods, largely due to differences in educational attainment and university selection. We find that although the use of networks cannot account for the private school advantage, they provide an additional advantage and this varies by the type of top occupation that the graduate enters.

1.1 Introduction

The UK government has stated that it aims to create a society in which each individual, regardless of background, has an equal chance of realising their potential (Cabinet Office, 2011). Yet educational achievement still varies significantly by socio-economic background and, partly because of this, the UK has relatively low levels of intergenerational income mobility (Ermisch et al., 2012). One specific aspect of this problem has been investigated by Alan Milburn in his reports on fair access to higher paying professions⁶. Milburn found that individuals from more advantaged backgrounds continue to be more likely to secure a higher-paid professional role, with many employers recruiting from a very limited range of universities and degree subjects. For example, he reported that even in 2012, of the top 200 civil servants only one in five was educated at a state comprehensive. Just over 40% of barristers had gone to a private secondary school and one third had attended Oxbridge. In this paper, we contribute new evidence to this debate, exploring the relative importance of educational achievement and social networks in explaining the socio-economic gap in graduates' access to high-status 'top' occupations.

We define what we mean by high-status occupation below, but broadly these are occupations that have high earnings, more job security and better longer-term income prospects (Goldthorpe and McKnight, 2006). We contribute to the literature by focusing on the extent to which family background is correlated with being employed in one of these specific occupations for a recent cohort of graduates, *even after allowing for educational achievement*. We also assess whether social networks play a significant role in perpetuating unequal access to these jobs. We use data from the Higher Education Statistics Agency⁷ on first degree graduates leaving higher education in 2006/07 and who have been surveyed at six months and at around 3.5 years after graduation.

We need to better understand access to these high-status occupations as this will influence the later occupational status, job quality and crucially the earnings and resources available to the individual over their lifetime. Indeed, in the UK we have lacked good data on the lifetime earnings of graduates, instead having to rely on early measures of graduates' earnings which may not be a good guide to their longer-term economic prospects, as many graduates earn less in their early career due to shorter tenure and a focus on training.

⁶ <http://webarchive.nationalarchives.gov.uk/±/http://www.cabinetoffice.gov.uk/media/227105/fair-access-summary.pdf>. See also Macmillan (2009).

⁷ http://www.cabinetoffice.gov.uk/sites/default/files/resources/IR_FairAccess_acc2.pdf.

Assessing graduates' transitions into occupations that have good long-run economic prospects is one way to get partially around this data problem and to illicit some insight into the influence of socio-economic background on the long-term labour market success of graduates.

1.2 Related literature

This paper contributes to the extensive research that has identified low levels of intergenerational income mobility in the UK (Blanden et al., 2013; Corak, 2013; Crawford et al., 2011). Educational attainment in the UK also varies by socio-economic background (Devine and Li, 2013; Gregg and Macmillan, 2010; Goodman et al., 2011; Chowdry et al., 2012; Crawford et al., 2010; Jerrim, 2012; Green et al., 2012) and is a key driver of persistence in incomes across generations (Blanden et al., 2007).

Our research focuses on access to elite occupations by family background. Access to managerial and professional careers are of particular interest as they are expected to account for approximately one and half million additional jobs in the next decade, increasing their share of total employment in the UK from 29% to 32% (Wilson and Homenidou, 2011; Brewer et al., 2012). While there have been a number of official reports published on this topic (Cabinet Office, 2009, 2012), academic research on potential barriers to professional careers is limited (Langlands, 2005; Sutton Trust, 2005, 2006). Macmillan (2009) found an increase in the proportion of professionals originating from wealthier families between 1958 and 1970 in nine of the 12 professions examined, and Bukodi and Goldthorpe (2011b) highlight the influence of education, particularly higher tertiary qualifications, and class origin on access to the salariat (defined as NS-SEC classes 1 and 2).

We build on this work, focusing on elite occupations (NS-SEC 1 only), incorporating analysis of female graduates and attempting to isolate the relationship between background and occupation by taking fuller account of individuals' school and university experiences, including subject of degree and institution attended. Our work is also closely related to the international research on the extent to which children are employed in the same organisations as their parents (Corak and Piraino, 2010; Bingley et al., 2011), although we take a wider approach, considering a number of measures of background and measuring the extent to which children with parents working in elite occupations are more likely to work in these high-status occupations themselves.

We also assess whether the use of networks explains a significant proportion of the socio-economic gap in access to high-status occupations. Networks represent informal channels of job search, including employee referrals and social connections (Rees, 1966) and are one important element of social capital (Loury, 1977; Coleman, 1990). Numerous theoretical contributions have modelled the influence of networks on labour market outcomes (Montgomery, 1991; Calvo- Armengol, 2004, 2007; Casella and Hanaki, 2005; Granovetter 1973, 1974(1995)). Networks are considered to be productive and low-cost methods of generating job offers (Holzer, 1988), usually with benefits for income and job tenure (Loury, 2006). However, reliance on networks may also cause a mismatch between occupational choice and productive advantage, thus lowering wages (Bentolila et al., 2010). Ioannides and Loury (2004) outline the widespread use of networks and find significant variation in the usage and productivity of networks between job seekers.

This variation and complexity provides mixed evidence on the role of networks in accessing top jobs. Marsden and Gorman (2001) present evidence that network contacts are more likely to be used by firms where high- quality information about workers' likely performance is important, such as in managerial and professional positions. However, evidence to the contrary indicates that informal recruitment processes may be used less frequently than expected for 'top jobs' (Pellizzarri, 2004; Rivera, 2012). Pellizzari (2004) further finds that use of personal contacts leads more frequently to jobs in small- and medium-sized firms, perhaps indicating that networks may be more valuable for securing top jobs in smaller firms rather than larger firms that are more likely to have formalised recruitment processes.

Networks also provide privileged access to valuable work experience opportunities, which are crucial stepping stones to securing a top job (Kramarz and Skans, 2006; Francis and Sommerlad, 2009; Rolfe and Anderson, 2003). Several US studies have conducted evaluations of 'school to work' initiatives, which often include work experience opportunities but also mentoring and employer engagement (Neumark and Rothstein, 2006; Kemple and Willner, 2008). The findings from these studies are mixed. An AIR UK (2008) report for the UK government indicates that only a few similar robust evaluations have been undertaken in the UK, but, for those available, school links with employers have positive effects on student attainment, employability and initial wages. Mann (2012) also found that young people in the UK who have had regular contact with employers while in education are five times less likely to be NEET ('not in education, employment or training') and earn, on average, 16% more than their peers who did not

have the advantage of this regular contact. More broadly, the importance of finding work experience, internships and placement opportunities is also regularly highlighted by national reviews and graduate recruitment research (Wolf, 2011; Association of Graduate Recruiters, 2012; CBI, 2011), thus again highlighting the disadvantage faced by students without access to relevant networks.

1.3 Data

We use data from the Destinations of Leavers from Higher Education (DLHE) ‘early’ and ‘longitudinal’ surveys carried out by the UK Higher Education Statistics Agency (HESA). The ‘early survey’ is conducted approximately six months after graduation⁸, with a total 453,880 eligible leavers in 2006/2007, of which 332,110 (73.2%) responded: the response rate is in line with previous years (HEFCE, 2011). A longitudinal survey was conducted up to 3.5 years after graduation⁹ for a sub-sample of students¹⁰, with 49,065 valid responses from the 332,110 students who responded to the census survey¹¹. Of these, we limit our final sample to 24,980 graduates who finished higher education in 2006/2007 during the reference period, completed the survey at 3.5 years after graduation, studied for an undergraduate degree, were aged 18–25 on 31 July 2007 and provided occupational data (Standard Occupation Classification (SOC) 2000¹²). Appendix Table A1.2 suggests that this restricted sample looks very similar to the ‘early survey’ sample in terms of student characteristics. We focus our analysis on graduates some 3.5 years after graduation because the period immediately after graduation is transitional. Some graduates may take temporary jobs or no job at all. We are more confident that their occupation 3.5 years after graduation is a better guide to their future occupational status.

The occupational status of graduates at 3.5 years after graduation is measured using 5-digit SOC 2000 codes. We aggregate this into a form that enables us to rank the socio-economic status of occupations. We assign each individual an analytical National

⁸ The Longitudinal Destination of Leavers from Higher Education.

⁹ Reference dates of 16 April 2007 (if the leaver obtained the qualification between 1 August 2006 and 31 December 2006) and January 2008 (if the leaver obtained the qualification between 1 January 2007 and 31 July 2007).

¹⁰ The process used by HESA for constructing the subsample is explained here: https://www.hesa.ac.uk/component/studrec/show_file/06019/Guidelines_for_use_of_the_DLHE_Longitudinal_Survey_Dataset.html.

¹¹ The HESA technical report indicates that the pattern of non-response from previous studies meant that women older graduates and white graduates were more likely to respond and this varied by subject and institution (HESA, 2009). Reference date 29 November 2010.

¹² <http://www.ons.gov.uk/ons/guide-method/classifications/archived-standard-classifications/standard-occupationalclassification-2000/about-soc-2000/index.html>.

Statistics Socio-economic Classification¹³ (NS-SEC) codes 1 to 7¹⁴. Individuals' positions within this scale have been shown to be a major influence on their economic life chances (Chan and Goldthorpe, 2007)¹⁵. We define high-status¹⁶ occupations as those in the top NS-SEC 1 grouping (29.8% of the total sample of graduates).

We also consider three separate groups of occupations within NS-SEC 1 in our analysis: (a) higher managerial (NS-SEC 1.1 occupations), (b) business, medical and law professionals and (c) other professionals (including educational, built environment, scientist and other NS-SEC 1.2 occupations). Occupations within these groupings are listed in the Appendix Table A1.1. These high-profile occupations within NS-SEC 1 are the focus of government policies for promoting fair access, and there are clear differences in the labour market reward by groups of occupations: on average, individuals working in higher managerial occupations earned £81,000 in 2011 compared to £51,000 for business, medical and law professions and £39,000 for other professions compared to £24,000 for all other occupations (NS-SEC 2–7¹⁷. Table 1.1 shows the proportion of graduates in our sample employed in these high-status occupations at 3.5 years after graduation (column 1) and the average annual earnings in 2011 by occupation grouping.

We have three measures of family background available: parental NS-SEC, the neighbourhood participation rate in higher education and type of secondary school attended. Undergraduate students entering higher education through UCAS are asked to provide information on their parents' occupations, though some choose not to do this, particularly mature students, which may explain the relatively high rate of missing data. Missing parental NS-SEC data (18.8% of our sample) includes graduates for whom the occupation of their parents is either unclassified (14.4%) or unknown (4.4%). Appendix Table A1.3 illustrates the proportion of our sample with missing information. The extent

¹³<http://www.ons.gov.uk/ons/guide-method/classifications/current-standard-classifications/soc2010/soc2010-volume-3-ns-sec-rebased-on-soc2010-user-manual/index.html>.

¹⁴ Due to the lack of data on employment status, we are restricted to using the simplified method of conversion between SOC 2000 and NS-SEC. This has around 88 per cent success rate compared to the full method of conversion.<http://www.ons.gov.uk/ons/guide-method/classifications/archived-standard-classifications/standard-occupational-classification->.

¹⁵ Measures of earnings at age twenty-five may suffer from significant biases due to age- earnings profiles and therefore understate the true role of family background (Haider and Solon, 2006). Of course, occupation is likely to also change across the life-cycle although appears stable after age thirty (Bukodi *et al.*, 2011).

¹⁶ We acknowledge that status commonly refers to an alternative concept of social honour in the sociological literature (Chan and Goldthorpe, 2007).

¹⁷ Data taken from the Annual Survey of Hours and Earnings (ASHE <http://www.ons.gov.uk/ons/rel/ashe/annual-survey-of-hours-and-earnings/index.html>) average annual earnings for 2011 for all workers by 4-digit SOC code.

of missing data is identical for those in top NS-SEC occupations as it is for NS-SEC 2–7 occupations.

Our measure of neighbourhood higher education participation is based on the POLAR3 classification, which contains rankings of higher education participation by area (Census Area Statistic wards). From this, quintiles of areas are constructed, ordered from 1 (those with lowest participation) to 5 (those with highest participation). School type is binary: private (independent) schools and state schools¹⁸.

Columns 3 to 8 of Table 1.1 illustrate the socio-economic background of graduates employed in our various definitions of high-status occupations 3.5 years after graduation. Of those with professional or managerial parents, 31.5% work in high-status occupations compared to 27.3% with parents working in a lower NS-SEC occupation. Of those from low higher education (HE) participation areas, 24.2% enter top jobs compared to 29.8% from higher HE participation areas, and 40% of private school pupils enter an NS-SEC 1 occupation compared to 28.1% of state school pupils.

¹⁸ Schools not classified as independent are deemed to be state schools, therefore students from selective grammar schools, sixth forms and further education colleges are also included as state schools.

Table 1.1: Family background of those entering into high-status professions

	Frequency (%)	Average earnings (2011 £s)	Parental NS-SEC		Neighbourhood participation		School type	
			1-2	3-8	Low	Not low	State	Private
NS-SEC 1	29.8	52,024	31.5	27.3	24.2	29.8	28.1	39.8
NS-SEC 2-7	70.2	24,163	68.5	72.7	75.8	70.2	71.9	60.2
Total	100.0							
<i>Within top NS-SEC</i>								
Higher managerial NS-SEC 1.1	6.1	81,057	6.6	5.7	5.3	6.1	5.5	9.8
<i>Within NS-SEC 1.2</i>								
Business	4.6	64,691	5.0	4.5	3.3	4.6	4.0	8.6
Medical	3.5	46,496	3.0	2.2	2.2	3.6	3.2	5.6
Law	2.4	52,672	3.0	2.1	1.8	2.4	2.2	4.2
Education	3.1	37,775	3.8	2.8	2.4	3.1	3.1	3.2
Built Environment	8.4	40,218	8.3	8.3	7.1	8.4	8.4	7.2
Scientists	1.5	39,740	1.5	1.7	2.2	1.5	1.6	1.0
Other	0.3	54,316	0.4	0.3	0.1	0.4	0.3	0.4
Total	29.8							

Notes: Data in column 2 from the Annual Survey of Hours and Earnings (ASHE) average annual earnings for 2011 for all workers by 4-digit SOC code. Occupations within professional groupings: business – accountants, economists, statisticians, brokers, underwriters, tax specialist; legal – judges, barristers, solicitors; life science – doctors, dentists, pharmacists, psychologists, veterinarians; education – higher education teachers and researchers, secondary and primary head teachers, senior administrators; built environment – engineers, IT consultants, architects and surveyors; scientists – chemists, biologists, physicists, astronomers, mathematicians; other – clergy, probation officers, aircraft pilots.

Within the top NS-SEC, there are notable differences in the family background of those entering different careers. Graduates from higher parental NS-SEC backgrounds, higher HE participation areas and who attended a private school are more likely to enter into higher managerial or business, medical and law professions. The picture for other professions is more mixed. State school pupils are more likely to enter into built environment and scientist occupations than private school pupils. Scientists are more likely to be from lower parental NS-SEC families, from low participation areas and state educated on average.

When considering the role of networks, we use information on the channels that the graduates used to find out about the job that they are employed in 3.5 years after graduation. Three types of network are identified: professional (professional, work or educational contacts or networks), personal (personal contacts, including family, friends and social networks) and already/previously having worked for the organisation. Our baseline category includes students who found out about their job in other ways, using non-network channels (recruitment agency, career service, employer website, media advertisement, speculative application or other). In reality, graduates are likely to have used numerous job search channels. However, the DLHE survey only permits one channel to be reported. Graduates may also systematically under-report their use of networks due to the perception of not gaining employment on the basis of merit alone. These measurement issues indicate that the true propensity of graduates to use networks may be higher than observed in our analysis, although it is unclear whether this would vary by final occupation grouping.

The descriptive statistics presented in Table 1.2 show the use of different types of networks by occupation grouping. Professional networks are used by 11.2% of those working in NS-SEC 1 occupations compared to 8.2% in NS-SEC 2–7 occupations. Personal networks are actually used less in NS-SEC 1 jobs than in lower NS-SEC 2–7 jobs but within NS-SEC 1 jobs they are used by 16.1% of graduates entering higher managerial occupations compared to 10.5% of graduates entering business, medical and law professions.

Table 1.2: How those entering high-status occupations found out about their jobs (%)

NS-SEC Destination outcome:	1 NS-SEC 1 job	1.1 Higher managerial	1.2 Business, medical and law	1.2 Other professions	2–7 Other graduate jobs
Professional networks	11.2	8.5	11.1	12.5	8.2
Personal networks	12.4	16.1	10.5	12.1	14.3
Previously worked for employer	9.2	10.4	7.9	9.7	9.6
Other:	65.0	60.9	68.2	64.2	66.3
Total	100.0	100.0	100.0	100.0	100.0
<i>Within other</i>					
Career services or web	38.8	30.4	44.9	37.7	38.5
Recruitment agency	15.9	19.5	11.6	17.7	18.1
Other way	10.3	11.0	11.7	8.8	9.7
Total	65.0	60.9	68.2	64.2	66.3
Networks missing	2.3	4.1	2.2	1.5	1.7

Notes: Other professions include: education, environment, scientists and other occupation groups from NS-SEC 1.2.

1.4 Methodology

We hypothesise that more socio-economically advantaged students will acquire more human capital and in turn will access top jobs to a greater extent than more disadvantaged students. To the extent that we can control for individual human capital, however, we might expect socio-economic background to have an additional independent impact on the likelihood of accessing a top job. This might occur if more advantaged students can afford to invest greater resources in their job search, taking more time to secure the top job they want. Sociological theories also suggest that more advantaged students will be more likely to secure a top job because they have greater levels of social capital. We cannot measure all aspects of students' human and social capital but we are able to assess whether the use of networks plays a role in helping to secure a high-status occupation. We use this as a proxy for their social capital.

Family background and accessing top jobs

We consider the raw association between family background and being in a top job 3.5 years after graduation. This association captures the overall relationship between family background and securing a top job, regardless of the mechanisms driving this relationship. Given that entry into a top job is a binary variable, we estimate equation (1) using a probit

model, where $F(\cdot)$ is the cumulative normal distribution and X a vector of family background characteristics, including parental NS-SEC, quintiles of neighbourhood-level participation in higher education and a state school indicator.

$$F(\text{Top } j \text{ } ob_i^{child}) = \Phi(\alpha + \beta X_i^{family}) \quad (1)$$

The estimated parameters are presented as marginal effects, indicating the percentage point (ppt) change in the probability of entering a top job for a unit change in X , evaluated at the sample mean.

We pool male and female graduates to maximise our sample size. Males and females make different occupational choices and have different lifetime earnings. However, our data are from the early years of graduates' careers, when the gender wage gap is approximately zero (Manning and Swaffield, 2008), and by implication occupational choices are more similar¹⁹. We also estimate the model separately by gender: the coefficients on the variables of interest are not statistically significantly different from one another²⁰ though the smaller sample size does cause some coefficients to become statistically insignificantly different from zero (Appendix Table A1.4).

Ideally, we would like to measure the association between socio-economic background and securing a top job allowing for the individual's human capital. There are other factors associated with family background and the chances of entering into a top job that may be driving the observed association. First, we add potential confounders to our model to control for observable differences across graduates (equation (2)). Second, we add these in four blocks, first demographic controls (D = ethnicity, age and gender), then controls for human capital as measured by prior attainment, A , including UCAS tariff score, subject of degree and degree class. We do this to remove differences in access to top jobs driven by the academic achievement of the candidate and the subject specialism. Third, we control for institution effects (I) to condition on the choice of institution and region. This is to reflect the fact that studying at a prestigious institution can provide an additional advantage to students in terms of future employment. Finally, we condition on the type of postgraduate study undertaken up to 3.5 years after graduating (PG) to assess whether

¹⁹ The proportion entering higher managerial and business, medical and law professions are the same across gender. There are more males working in other professions (20 per cent compared to 8 per cent females), while there are more females in NS-SEC 2–7 occupations (76 per cent compared to 62 per cent males).

²⁰ Z score testing the difference between the two coefficients = 0.48

this is an important route into the top jobs and if this accounts for differences in entry by family background.

$$F(\text{Top } j \text{ job}_i^{\text{grad}}) = \Phi(\alpha + \beta X_i^{\text{amily}} + \gamma D_i^{\text{grad}} + \delta A_i^{\text{grad}} + \rho I_i^{\text{grad}} + \tau P G_i^{\text{grad}}) \quad (2)$$

The inclusion of these controls allows a ‘like-for-like’ comparison of graduates, at least in terms of observed characteristics. For example, professional firms often claim they recruit graduates based on academic attainment. Controlling for degree class, subject choice, prior attainment and where the graduate went to university ensures that we are comparing the chances of similar graduates entering top professions. The results show whether or not socio-economic background has an effect on occupational status over and above these controls. Despite our attempts to eliminate the impact of other factors on occupational status, graduates are still likely to differ in ways we do not observe, in particular in their aspirations, preferences and other aspects of non-cognitive ability, which may be influential in securing a professional career. We cannot control for these unobserved sources of selection bias in our model and we return to this issue in our conclusions.

When we analyse entry to higher managerial occupations, business, medical and legal professions and other professions compared to other graduate jobs (NS-SEC 2–7), we use a multinomial logit model, presenting the marginal effects of the probability of entering each occupation group relative to entering an NS- SEC 2–7 job evaluated at the sample mean. The multinomial logit model requires the assumption of the independence of irrelevant alternatives (IIA). This implies that the relative likelihood of preferring one occupational group to another must not depend on the availability of other irrelevant alternatives, which we argue is not an overly strong assumption in this case. It requires, for example, that a graduate’s relative likelihood of choosing a higher managerial occupation compared to a business occupation would be unaffected by other career options available to them. We argue that choice of occupation is dependent on a number of factors, including human and social capital and, as such, the existence of alternative occupation groupings is sufficiently independent to the individuals’ relative preferences, given their capital.

The role of networks

We add a measure of social capital to our models, namely the students’ use of networks (N) to get their job (equation (3)). We consider whether networks can account for any of the remaining socio-economic gradient in accessing top occupations after controlling for

a range of characteristics, or whether they have an independent effect over and above family background.

$$F(\text{Top job}_i^{\text{grad}}) = \Phi(\alpha + \beta X_i^{\text{family}} + \sigma N_i^{\text{grad}} + \gamma D_i^{\text{grad}} + \delta A_i^{\text{grad}} + \rho I_i^{\text{grad}} + \tau P G_i^{\text{grad}}) \quad (3)$$

If higher socio-economic status graduates disproportionately use networks to secure top jobs, then the inclusion of networks in the model should diminish the direct effect of family background. If networks significantly predict entry to top jobs but the remaining socio-economic gap remains intact, then this indicates that networks are being used but cannot explain the remaining socio-economic gradient in access.

1.5 Results

Family background and accessing the top jobs

Column 1 of Table 1.3 presents the marginal effects from our initial probit model in equation (1) to show the raw socio-economic gradient in access to top jobs before conditioning on any further characteristics²¹. Graduates with parents in a top NS-SEC occupation are 4.7 ppts more likely to be working in a top NS-SEC occupation compared to graduates whose parents work in a routine occupation (sample mean 29.8%). There are no other significant effects by parental NS-SEC, although graduates whose parents are long-term unemployed are 17.2 ppts less likely to work in a top NS-SEC occupation compared to graduates with routine occupation parents (note the unemployed parent group is very small).

²¹ Note that we include parental NS-SEC, neighbourhood participation and state school indicators together from the outset as we believe that each measure is contributing additional information regarding the family's socio-economic status. The pseudo R-squared for parental NS-SEC alone is 0.003, for neighbourhood participation alone is 0.005 and for state school indicator alone is 0.005. Attending a state school has a correlation of 0.31 with parental NS-SEC, 0.09 with neighbourhood participation and parental NS-SEC and neighbourhood participation have a correlation of 0.11.

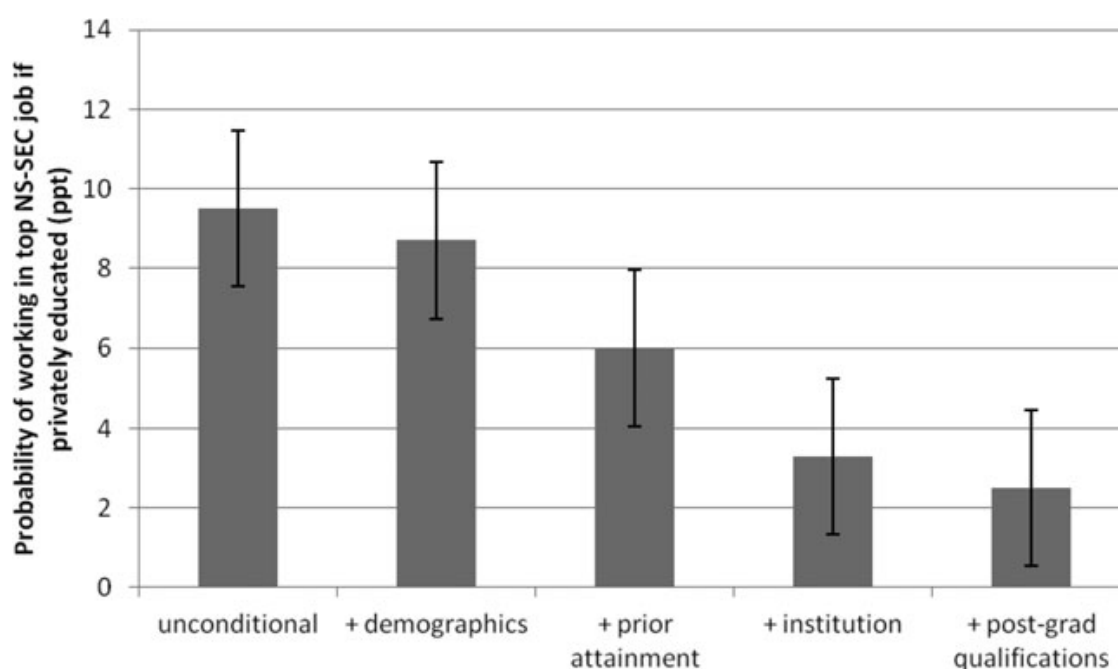
Table 1.3: Marginal effects of family background on having a high-status occupation (NS-SEC 1) 3.5 years after graduation compared to other occupations (NS-SEC 2-7)

Professional	0.047(0.018)***	0.066(0.018)***	0.018(0.018)	0.003(0.022)	-0.001(0.022)
Lower manager	0.009(0.017)	0.026(0.017)	-0.002(0.017)	-0.011(0.020)	-0.012(0.021)
Intermediate	-0.001(0.018)	0.012(0.018)	-0.007(0.018)	-0.017(0.023)	-0.020(0.023)
Small employer	-0.007(0.020)	0.006(0.020)	-0.018(0.019)	-0.018(0.025)	-0.021(0.025)
Supervisor	0.014(0.022)	0.025(0.022)	-0.001(0.022)	-0.008(0.024)	-0.008(0.024)
Semi-routine	-0.001(0.019)	0.09(0.019)	-0.006(0.019)	-0.014(0.025)	-0.013(0.025)
Routine	Baseline	Baseline	Baseline	Baseline	Baseline
Unemployed	-0.172(0.066)*	-0.171(0.069)**	-0.100(0.087)	-0.111(0.071)	-0.110(0.070)
Low participation	-0.031(0.013)**	-0.029(0.013)**	-0.021(0.013)	-0.016(0.013)	-0.013(0.013)
2nd quintile part.	-0.016(0.011)	-0.014(0.011)	-0.011(0.011)	-0.009(0.013)	-0.009(0.013)
3rd quintile part.	Baseline	Baseline	Baseline	Baseline	Baseline
4th quintile part.	0.009(0.009)	0.009(0.009)	0.006(0.010)	0.006(0.010)	0.005(0.011)
High part.	0.039(0.009)***	0.036(0.009)***	0.022(0.008)**	0.015(0.010)	0.015(0.009)
State school	-0.095(0.010)***	-0.087(0.010)***	-0.060(0.010)***	-0.033(0.013)**	-0.025(0.013)*
N	24,980	24,980	24,980	24,980	24,980
Pseudo R-squared	0.010	0.034	0.146	0.162	0.176
Controls					
Demographics		x	x	x	x
Prior attainment			x	x	x
Institution				x	x
Post-grad. qual.					x

Demographics: Gender, age, ethnicity. Prior attainment: UCAS tariff, subject, attainment. Institution: institution fixed effects, region of institution. Post-graduate: higher research, taught, post-graduate certificate/diploma or other at three years. Robust standard errors in parenthesis. In models including institution FE standard errors are clustered at institution level. * 90% confidence, ** 95% confidence, *** 99% confidence.

A socio-economic gradient also exists in terms of the neighbourhood measure of HE participation. A graduate from a low participation area is 3.1 ppts less likely to enter a top job, while a graduate from a high participation area is 3.9 ppts more likely to enter a top job than a graduate from an average participation area. The strongest gradient is observed for those who attended state schools compared to privately educated graduates. Figure 1 plots the private school advantage for each of the five specifications we consider. As seen in the first bar, before conditioning on any additional characteristics, graduates who attended a private school are 9.5 ppts more likely to enter a top job 3.5 years after graduation than a state educated graduate (who has a mean 28.1% chance of entering a top job).

Figure 1.1: Marginal effects of private school attendance on having a high-status occupation (NS-SEC 1) 3.5 years after graduation compared to other occupations (NS-SEC 2–7)



Columns 2 to 5 add controls as discussed in the previous section. Adding in demographic controls does little to the estimated socio-economic gradients across the measures and in some cases accentuates the findings from the baseline specification. However, when conditioning on prior attainment, degree subject, degree classification and UCAS tariff point score, the socio-economic gradient is reduced substantially²². This implies that a main mechanism by which socio-economic background impacts on access to a high-status profession is via enhancing educational achievement (human capital). There is little

²² Prior attainment and degree classification are the important drivers here rather than degree subject choice.

difference now in the probability of accessing a top job by parental occupation. Living in a high participation neighbourhood is associated with an additional 2.2 ppt advantage in accessing a top job (compared to an average participation neighbourhood). However, even when conditioning on prior attainment, state school educated graduates are still 6.0 ppts less likely to enter into a top job than a comparable privately educated graduate, who took the same subject and achieved the same grade in their degree (and A-levels).

Conditioning on the higher education institution attended further reduces this negative state school gradient by 45% to 3.3ppt: one mechanism through which attending a private school increases a graduate's chances of entering a high-status occupation is therefore by increasing the chances that the student attends a high- status university. It is less clear whether this is because private schools are better able to help their students secure places in high-status universities or whether their students just have a stronger preference for attending such institutions. However, even when accounting for these different choices and conditioning on post-graduate qualifications, the final column of Figure 1 shows that private school graduates are still 2.5 ppts more likely to access an NS-SEC 1 occupation than a comparable state school graduate who has parents from a similar NS-SEC group, is from the same type of neighbourhood, got similar A-levels and has the same degree classification in the same subject from the same institution and has obtained similar post-graduate qualifications (and who has a 28.1% chance of accessing an NS-SEC 1 occupations).

Interesting differences in access to high-status occupations also exist within NS-SEC 1 occupations. Table 1.4 presents the marginal effects from a multinomial logit model comparing access to (a) higher managerial (b) business, medical and law professions and (c) other professions as compared to NS-SEC 2–7 jobs.

Graduates with lower managerial parents are 1.8 ppts more likely to work in a higher managerial occupation at 3.5 years after graduation than graduates with a parent working in a routine occupation (6.1% of the sample access higher managerial occupations). Those living in high participation neighbourhoods are 0.8ppts more likely to work in these top occupations compared to graduates from an average participation neighbourhood. Figure 2 illustrates that the private school advantage is large, with privately educated graduates 3.4ppts more likely to work in a higher managerial position than state educated graduates (baseline 5.5%). When we condition on demographics and prior attainment, the SES gradients remain intact suggesting that access to these particular occupations is not related to gender, ethnicity, age or indeed prior attainment.

Controlling for the HE institution removes any differences by parental NS-SEC, although an effect remains for neighbourhood participation and type of school attended. Controlling for postgraduate qualifications further reduces the socio-economic gradient. Comparing a privately educated and state educated graduate from the same type of family and neighbourhood, with the same prior attainment, from the same institution, with the same post-graduate qualifications, the privately educated graduate has a small (1.0ppt over a 5.5% baseline for state school graduates) but statistically significant advantage over the state school graduate. The neighbourhood HE participation rate and parental SES measures are statistically insignificant.

Figure 1.2. Marginal effects of private school attendance on having alternative high-status occupations (within NS-SEC 1) 3.5 years after graduation compared to other occupations (NS-SEC 2–7)

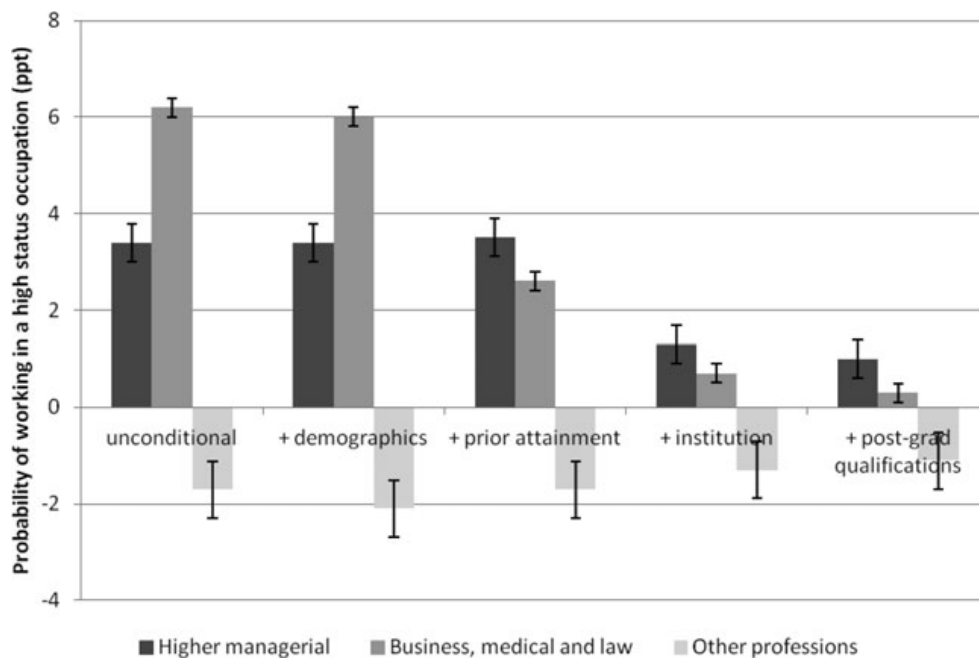


Table 1.4: Marginal effects from a multinomial logit model of family background on having alternative high-status occupations 3.5 years after graduation compared to other occupations (NS-SEC 2–7)

<i>Panel A: Higher managerial – 6.1% sample mean</i>					
Professional	0.012(0.010)	0.012(0.010)	0.013(0.010)	0.004(0.005)	0.003(0.004)
Lower manager	0.018(0.010)*	0.018(0.010)*	0.018(0.010)*	0.006(0.005)	0.005(0.004)
Intermediate	0.015(0.011)	0.015(0.011)	0.014(0.011)	0.004(0.005)	0.004(0.004)
Small employer	0.010(0.012)	0.011(0.011)	0.010(0.012)	0.004(0.006)	0.004(0.005)
Supervisor	0.008(0.013)	0.008(0.012)	0.010(0.013)	0.003(0.006)	0.003(0.004)
Semi-routine	0.006(0.011)	0.007(0.011)	0.006(0.011)	0.001(0.006)	0.001(0.005)
Routine	Baseline	Baseline	Baseline	Baseline	Baseline
Unemployed	−0.008(0.043)	−0.010(0.059)	−0.018(0.060)	−0.016(0.028)	−0.012(0.022)
Low participation	0.002(0.007)	0.001(0.007)	0.000(0.007)	0.001(0.003)	0.000(0.003)
2nd quintile part.	0.001(0.006)	0.001(0.006)	0.002(0.006)	0.001(0.003)	0.001(0.003)
3rd quintile part.	Baseline	Baseline	Baseline	Baseline	Baseline
4th quintile part.	0.007(0.005)	0.007(0.005)	0.007(0.005)	0.004(0.002)*	0.003(0.002)*
High part.	0.008(0.005)*	0.007(0.005)	0.008(0.005)*	0.004(0.002)*	0.003(0.002)*
State school	−0.034(0.005)***	−0.034(0.004)***	−0.035(0.005)***	−0.013(0.002)***	−0.010(0.002)***
<i>Controls</i>					
Demographics		x	x	x	x
Prior attainment			x	x	x
Institution				x	x
Post-grad qual.					x

Table 1.4. Continued.

Panel B: Business, medical and law – 10.5% sample mean

Professional	0.024(0.013)**	0.035(0.012)**	0.005(0.008)	0.001(0.004)	0.000(0.002)
Lower manager	-0.003(0.011)	0.007(0.012)	-0.008(0.008)	-0.003(0.003)	-0.002(0.002)
Intermediate	0.005(0.013)	0.012(0.012)	0.002(0.009)	-0.000(0.004)	-0.001(0.002)
Small employer	-0.006(0.013)	-0.000(0.014)	-0.010(0.010)	-0.003(0.004)	-0.002(0.002)
Supervisor	-0.006(0.015)	0.002(0.016)	0.003(0.011)	0.001(0.004)	-0.000(0.002)
Semi-routine	-0.012(0.012)	-0.009(0.014)	-0.005(0.009)	-0.002(0.004)	-0.001(0.002)
Routine	Baseline	Baseline	Baseline	Baseline	Baseline
Unemployed	-0.072(0.045)	-0.078(0.095)	-0.002(0.056)	-0.005(0.016)	0.001(0.007)
Low participation	-0.026(0.008)***	-0.024(0.010)**	-0.012(0.007)*	-0.004(0.003)	-0.002(0.001)
2nd quintile part.	-0.018(0.007)**	-0.018(0.008)**	-0.014(0.006)**	-0.004(0.002)**	-0.002(0.001)**
3rd quintile part.	Baseline	Baseline	Baseline	Baseline	Baseline
4th quintile part.	-0.004(0.006)	-0.003(0.006)	-0.004(0.004)	-0.002(0.002)	-0.001(0.001)
High part.	0.016(0.006)***	0.016(0.006)***	0.004(0.004)	0.000(0.002)	0.000(0.001)
State school	-0.062(0.007)***	-0.060(0.005)***	-0.026(0.004)***	-0.007(0.002)***	-0.003(0.001)***
<i>Controls</i>					
Demographics		x	x	x	x
Prior attainment			x	x	x
Institution				x	x
Post-grad qual.					x

Table 14. Continued.

Panel C: Other professions – 13.3% sample mean

Professional	0.011(0.012)	0.016(0.012)	−0.002(0.010)	−0.004(0.007)	−0.004(0.005)
Lower manager	−0.005(0.012)	0.001(0.011)	−0.007(0.010)	−0.006(0.007)	−0.005(0.005)
Intermediate	−0.020(0.012)	−0.015(0.012)	−0.020(0.011)*	−0.013(0.008)*	−0.011(0.006)*
Small employer	−0.010(0.014)	−0.004(0.013)	−0.014(0.012)	−0.009(0.008)	−0.008(0.006)
Supervisor	0.011(0.015)	0.013(0.014)	−0.009(0.013)	−0.007(0.009)	−0.004(0.007)
Semi-routine	0.003(0.014)	0.010(0.013)	−0.004(0.011)	−0.005(0.008)	−0.004(0.006)
Routine	Baseline	Baseline	Baseline	Baseline	Baseline
Unemployed	−0.162(0.118)	−0.160(0.112)	−0.091(0.011)	−0.066(0.060)	−0.052(0.047)
Low participation	−0.009(0.010)	−0.009(0.009)	−0.007(0.008)	−0.003(0.006)	−0.002(0.004)
2nd quintile part.	−0.000(0.008)	0.001(0.008)	0.002(0.007)	0.001(0.005)	0.001(0.004)
3rd quintile part.	Baseline	Baseline	Baseline	Baseline	Baseline
4th quintile part.	0.005(0.007)	0.003(0.006)	0.002(0.006)	0.000(0.005)	0.000(0.003)
High part.	0.014(0.006)**	0.011(0.006)*	0.007(0.005)	0.003(0.004)	0.002(0.003)
State school	0.017(0.007)***	0.021(0.007)***	0.017(0.006)***	0.013(0.004)***	0.011(0.003)***
<i>Controls</i>					
Demographics		x	x	x	x
Prior attainment			x	x	x
Institution				x	x
Post-grad qual.					x
<i>N</i>	24,980	24,980	24,980	24,980	24,980
Pseudo R-squared	0.011	0.037	0.185	0.208	0.226

Demographics: Gender, age, ethnicity. Prior attainment: UCAS tariff, subject, attainment. Institution: institution fixed effects, region of institution. Post-grad: higher research, taught, post-grad certificate/diploma or other at three years. Robust standard errors in parenthesis. In models including institution fixed effects, standard errors are clustered at institution level. *90% confidence, **95% confidence, ***99% confidence.

A similar picture emerges when considering access to business, medical and law professions, although for this grouping the raw private school association is slightly larger (6.2ppt advantage on a state school baseline of 9.4%), and more of the background effect can be accounted for by prior attainment (Figure 2). The significant association between having parents in the top NS-SEC group and entering a business, medical or law profession disappears once we control for prior attainment. Even when conditioning on all of these variables, including prior attainment, degree subject and institution and postgraduate qualifications, there is still a small but significant advantage from a private school education: privately educated graduates are 0.3 ppts more likely to work in these occupations than a comparable state educated graduate.

If we focus on other professions, the private school advantage is reversed, as seen in Figure 2. Privately educated graduates are 1.7 ppts less likely than state educated graduates to work in these occupations in the initial specification and 1.1 ppts less likely in the full model (baseline is 13.4% for state school graduates). This finding is perhaps surprising, although it could indicate different preferences between state and privately educated students. Top state school graduates may choose to select into alternative types of careers compared to privately educated graduates or, given the increased likelihood of private school graduates accessing top managerial and business, medical and law professions, state school graduates may be sorted into these other professions.

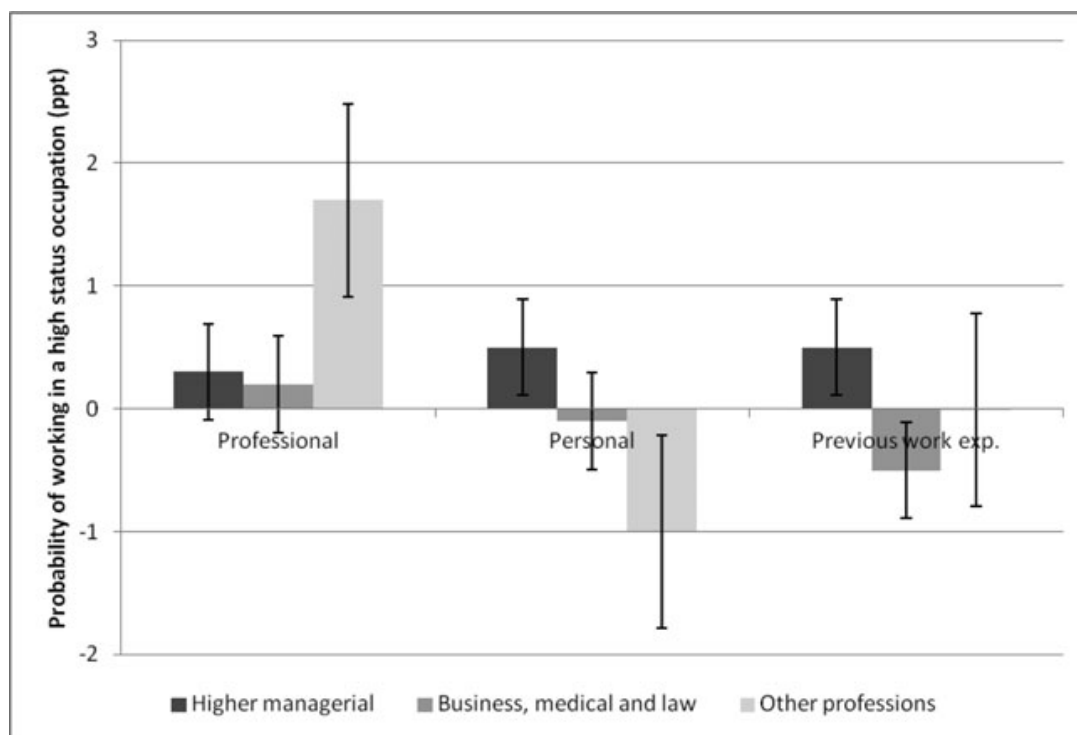
The role of networks in accessing top jobs

We explore one potential channel through which graduates from higher status families may gain preferential access to these occupations, namely the use of networks. Column 1 of Table 1.5 presents the relationship between socio-economic status and entering a top NS-SEC job before controlling for the use of networks (reproducing the last column of Table 1.3), whilst column 2 conditions on the use of networks (equation (3)), both conditioning on the full range of controls. It is clear that the residual socio-economic gap in accessing top jobs remains unchanged whether or not the use of networks is controlled for. Columns 3–8 repeat this analysis from multinomial logit models of the more detailed occupation groupings from Table 1.4. The inclusion of the network variable has very little impact on the residual relationship between family background and entering a top occupation. This suggests that, when conditioning on the full range of controls, the use of

networks is orthogonal to socio-economic status and not the main driver of these large residual socio-economic gaps in accessing top jobs²³.

The use of networks has a significant independent effect on the likelihood of accessing top jobs. However, these effects are likely to be understated due to network usage being under-reported as it may be regarded as non-meritocratic. Using a professional network to find a job, rather than some other method, increases the probability of working in an NS-SEC 1 job by 5.3 ppt. Figure 3 plots the association between using networks and access to higher managerial, business, medical and law professions and other professions. Use of professional networks is more strongly associated with accessing other professions. Access to higher managerial occupations is improved marginally by the use of personal networks and previous work experience.

Figure 1.3: Marginal effects of the use of networks to find out about a job on having a high-status occupation 3.5 years after graduation



²³ Indeed the correlation between the type of school attended and the use of networks is low in these data: the correlation between state school attendance and personal networks is 0.01, professional networks is 0.04 and previously working for the employer is 0.03.

Table 1.5: Marginal effects of family background on having a high-status occupation 3.5 years after graduation conditioning on the use of networks

	NS-SEC 1		Higher managerial		Business, medical and law		Other professions	
	No	Networks	No	Networks	No	Networks	No	Networks
	networks		networks		networks		networks	
Professional	-0.001(0.022)	-0.002(0.022)	0.003(0.004)	0.004(0.005)	0.000(0.002)	0.000(0.003)	-0.004(0.005)	-0.005(0.006)
Lower manager	-0.012(0.021)	-0.012(0.021)	0.005(0.004)	0.006(0.005)	-0.002(0.002)	-0.003(0.003)	-0.005(0.005)	-0.007(0.006)
Intermediate	-0.020(0.023)	-0.021(0.023)	0.004(0.004)	0.004(0.006)	-0.001(0.002)	-0.001(0.003)	-0.011(0.006)*	-0.014(0.007)*
Small employer	-0.021(0.025)	-0.021(0.025)	0.004(0.005)	0.004(0.006)	-0.002(0.002)	-0.002(0.004)	-0.008(0.006)	-0.010(0.007)
Supervisor	-0.008(0.024)	-0.008(0.024)	0.003(0.004)	0.003(0.005)	-0.000(0.002)	-0.000(0.004)	-0.004(0.007)	-0.005(0.008)
Semi-routine	-0.013(0.025)	-0.012(0.025)	0.001(0.005)	0.001(0.006)	-0.001(0.002)	-0.002(0.004)	-0.004(0.006)	-0.004(0.007)
Routine	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline	Baseline
Unemployed	-0.110(0.070)	-0.112(0.070)	-0.012(0.022)	-0.013(0.027)	0.001(0.007)	0.000(0.012)	-0.052(0.047)	-0.061(0.055)
Low participation	-0.013(0.013)	-0.013(0.013)	0.000(0.003)	0.001(0.003)	-0.002(0.001)	-0.003(0.002)	-0.002(0.004)	-0.002(0.005)
2 nd quintile part.	-0.009(0.013)	-0.009(0.013)	0.001(0.003)	0.001(0.003)	-0.002(0.001)**	-0.004(0.002)**	0.001(0.004)	0.001(0.005)

part.

Table 1.5. Continued.

	Business, medical and law Other professions							
	Top NS-SEC		Higher managerial					
	No networks	Networks	No networks	Networks	No networks	Networks	No networks	Networks
State school	-0.025(0.013)*	-0.024(0.013)*	-0.010(0.002)***	-0.012(0.002)***	-0.003(0.001)***	-0.005(0.002)***	0.011(0.003)***	0.013(0.004)***
Prof. network		0.053(0.012)***		0.003(0.003)		0.002(0.011)		0.017(0.004)***
Pers. network		-0.010(0.012)		0.005(0.002)**		-0.001(0.009)		-0.010(0.004)**
Prev. worked		-0.003(0.010)		0.005(0.003)*		-0.005(0.002)**		-0.000(0.004)
Controls								
Demographics	x	x	x	x	x	x	x	x
Prior attainment	x	x	x	x	x	x	x	x
Institution	x	x	x	x	x	x	x	x
Post-grad qual.	x	x	x	x	x	x	x	x
<i>N</i>	24,980	24,980	24,980	24,980	24,980	24,980	24,980	24,980
Log likelihood	0.176	0.177	0.226	0.229	0.226	0.229	0.226	0.229

Demographics: Gender, age, ethnicity. Prior attainment: UCAS tariff, subject, attainment. Institution: Institution fixed effects, region of institution. Post-grad: Higher research, taught, post-grad certificate /diploma or other at three years. Standard errors are clustered at institution level. *90% confidence, **95% confidence, ***99% confidence. First two columns from probit models. Other six columns from multinomial probit models.

1.6 Discussion and Conclusions

Our findings are stark. There is a large socio-economic gradient in the likelihood of a recent graduate accessing a top job, and differences across socio-economic groups are statistically significant. Our baseline model predicts that 40% of graduates who attended a private school secured a higher status occupation, compared to just 28% of students from state school backgrounds. In addition, 32% of graduates who come from higher SES family backgrounds (NS-SEC Group 1 or 2) enter top jobs compared to 27% from lower SES backgrounds (NS-SEC groups 3–7). Much of this socio-economic gradient is because socio-economically advantaged graduates have higher levels of human capital. They have higher achievement at Key Stage 5, are more likely to attend an elite university and take subjects that have greater economic value in the labour market. Even controlling for these differences in human capital, we still find a modest socio-economic gradient in access to top jobs. When we include a measure of social capital, namely use of networks, the socio-economic gradient remains. Higher SES students are more likely to say they have used a network to secure their job, but this does not explain the strong link between socio-economic background and getting a top job.

It is worth noting that our models compare the likelihood of equally qualified graduates from more and less advantaged backgrounds securing access to a top job. This may understate the true socio-economic gap in access to the professions. This is because we are comparing disadvantaged state school pupils who have achieved very highly in the system, despite their background, against those from more privileged backgrounds. The former group of students may not be fully representative of disadvantaged students as a whole. They are likely to be more motivated in ways we may not fully observe, and indeed they may achieve more highly precisely because they intend to go on to a professional job. We would therefore view our estimates as downward biased in this respect.

We have shown that it is not simply the case that socio-economically advantaged students are better qualified or use their networks in order to access top jobs. Our work discounts the notion that higher education completely levels the playing field between students of differing socio-economic backgrounds. Beyond academic achievement, our analysis suggests there are other reasons why more advantaged students, and particularly those who attended a private school, are somewhat more likely to secure a top job.

More socio-economically advantaged graduates may have other forms of capital that are important for accessing top jobs. These could include non- cognitive skills, including

confidence and self-esteem, that help individuals in interviews. Alternatively, these graduates could have greater cultural capital that enables them to exhibit desirable behaviours and conversations in the interview setting. They may have access to greater financial capital that enables them to increase the period of their job search or take unpaid internships and hence increase their likelihood of accessing a top job²⁴. Lastly, it may be the case that more advantaged graduates have different preferences and motivations, opting into higher status occupations. Our results comparing different occupation groupings within the top NS-SEC indicate some degree of sorting of individuals from different backgrounds into different career choices, which could represent different motivations. Note that even if this is the case, this is likely to be linked to differences in graduates' social and cultural capital. To the extent that we cannot measure all these factors, our identification strategy does not entirely eliminate the possibility that graduates are sorted into top jobs on the basis of characteristics unobserved by the researcher.

This research contributes to the literature by eliminating differences in education achievement and use of social networks as the sole reasons for the differences we observe in graduates' access to top professions, though the former is clearly very important. Further research is needed to establish which alternative explanations are most important.

The policy implications are important. The research tells us that among recent UK graduates, socio-economic background remains a significant factor in explaining why some students secure top jobs. After many decades of policies to improve social mobility and to widen participation in higher education, it remains the case that a student's family background has a major influence on their job and their life chances. The fact that this relationship is largely but not entirely explained by more advantaged students having demonstrably higher levels of human capital would imply that we must strive to achieve greater transparency in hiring practices so we fully understand why socio-economically disadvantaged students are somewhat less likely to get a top job even when they have the necessary human capital. Only when we understand this can we develop policies to address it.

²⁴ Indeed private school pupils are more likely to be out of work than their state educated counterparts (46 per cent and 40 per cent) six months after graduating, although the majority of these individuals (70 per cent and 66 per cent) are enrolled in post-graduate education. Ideally, we would observe these individuals 1.5 years after graduation to allow for pupils to finish their postgraduate studies, but there is no data to observe this.

Chapter 2**The Routes Through Which Cognitive and Non-Cognitive Skills Explain Socio-economic Gaps in Access to Elite Occupations****Claire Tyler****Abstract**

This paper provides new evidence on the role of cognitive and non-cognitive skills in the transmission of elite occupational status from parents to children. Using a new measure of access to elite occupations, focusing on working in an elite occupation at any point during the first half of an individual's career, the results show that children from elite families are twice as likely to 'ever' enter an elite occupation in adulthood as their less advantaged peers. Almost two-fifths of this gap in access to elite occupations can be explained by socio-economic gaps in cognitive and non-cognitive skills present at age 10, highlighting the early origins of individuals' career pathways. Half of this effect (one-fifth of the SES gap) relates to childhood skills being associated with early signs of career self-management in teenage years (including professional aspirations, challenge seeking values and commercial awareness) and educational attainment at school and university (including access to Russell Group universities and obtaining a 'good' degree). These are two important routes by which having higher levels of cognitive and non-cognitive skills helps children from elite families replicate the occupational advantage of their parents. The remaining half relates to childhood skills directly predicting access to elite careers in adulthood, even when holding other attributes constant. Overall, the results suggest a specific role for self-perception (locus of control), self control and regulation (application and lower externalising behaviour), social skills and cognitive ability in maths, reading and language comprehension in transmitting elite occupational advantage between generations. From a policy perspective, the research supports interventions to close SES gaps in these seven specific cognitive and non-cognitive skills in childhood; to encourage elite employers to capture and analyse the social background data of applicants and recruits to reduce bias in the recruitment process; and to encourage employers to widen contextual recruitment practices beyond academic performance criteria.

2.1 Introduction

Despite fair access to elite occupations being an ongoing aim of UK social mobility policy, access to and progression within these careers remains socially exclusive. Elite occupations usually offer better long-term earnings prospects, more autonomy and greater economic security and stability than other occupations (Goldthorpe & McKnight, 2006). They are also vitally important to the UK economy, increasing their share of total employment from 22.4% in 1994 to 29.8% in 2014, with further growth to 32.3% expected by 2024 (UKCES, 2016). Understanding socio-economic barriers to these elite occupations therefore plays an important role in ensuring equality of opportunity for all.

This paper explores the role of early cognitive and non-cognitive skills in creating barriers to elite occupations for individuals from lower socio-economic (SES) backgrounds. Early cognitive and non-cognitive skills are known to vary by socio-economic background and be important determinants of labour market outcomes. Prior literature has therefore shown that, as a *group*, these skills are an important route by which elite occupational advantage is transmitted from parents to children, largely through their influence on later educational attainment (McKnight, 2015; Sullivan et al., 2018a; Gugshvilli, Bukodi & Goldthorpe, 2017; Gregg, Macmillan and Vittori, 2019). But there is a lack of evidence on which skills *specifically* are important for access to elite occupations, including the role of career-related behaviours. This paper extends this research in three main ways.

Firstly, it estimates the relative importance of *specific* skills in explaining SES gaps in access to elite occupations. This is crucial if social mobility policy interventions are to be designed to tackle the skills that matter most. Secondly, it provides new evidence of the routes through which childhood skills influence access to elite occupations, identifying ‘career self-management’ – such as career aspirations, use of networks and work experience – as an important facilitator. Despite ongoing concerns that these attributes create barriers to elite occupations for those from lower socio-economic backgrounds, this has been understudied empirically. By also including a broader set of educational experiences and attainment than in related literature the results further reveal specific ways in which childhood skills promote access to elite occupations via educational attainment. Thirdly, from a methodological perspective, this paper demonstrates the value of analysing elite occupational outcomes over multiple waves of data rather than a single mid-career snapshot. This latter approach is common in related literature but conflates issues of access (whether individuals enter elite careers), retention (whether they remain in such careers) and progression (whether they are promoted within these careers). It also

underestimates the proportion of individuals ever accessing elite careers by almost a half and the importance of childhood skills for access to these careers by one-eighth.

Using data from the British Cohort Study (BCS), the findings show that almost two-fifths of this gap in access to elite occupations can be explained by socio-economic gaps in cognitive and non-cognitive skills present at age 10. The results highlight specific barriers relating to literacy and numeracy skills, alongside self-perception and self-control, with a smaller role for social skills. The findings further show that childhood skills predict early career self-management attributes in teenagers (especially professional aspirations, challenge-seeking values and commercial awareness), therefore providing new empirical evidence of an additional route, in addition to educational attainment, by which higher SES children with higher skills replicate the elite occupational status of their parents.

From a policy perspective, the research supports interventions to close SES gaps in the specific cognitive and non-cognitive skills highlighted as these could contribute to levelling the playing field of access to elite occupations. The research also supports policies which encourage elite employers to capture and analyse the social background data of applicants and recruits to ensure that recruitment tests which assess cognitive or non-cognitive skills do not create barriers to employment for less advantaged students. Furthermore, widening the scope of contextual recruitment practices where possible to include all recruitment criteria and tests (not only academic performance which is often the focus) may have benefits for social mobility.

The remainder of this paper proceeds with an overview of related literature (Section 2), followed by a discussion of the BCS70 data (Section 3), and the decomposition method and model specifications used (Section 4). Results and discussion of the implications for social mobility research, policy makers and employers follow in Sections 5 and 6. The paper concludes in Section 7 by summarising the key findings.

2.2 Related literature

2.2.1 SES disparities in access to elite occupations

Promoting fair access to elite occupations has been a long-standing aim of UK social mobility policy (e.g. Cabinet Office, 2009; 2011; 2012; SMC, 2022). However, access to and progression within these careers remains strongly associated with social background. For example, early access to elite jobs and higher earnings (up to 3.5 years after graduation) is related to parental occupation and private schooling (Macmillan, Tyler & Vignoles, 2015; Anders, 2015; Crawford & Vignoles, 2014). Social background is also

known to predict employment in elite occupations well into mid-career (Macmillan, 2009 (age 33/34); Bukodi & Goldthorpe, 2011a (age 34); Gugushvilli, Bukodi & Goldthorpe, 2017 (age 38); McKnight, 2015 (age 42); Sullivan et al., 2018a&b (age 42)). However, single snapshots of mid-career occupational outcomes conflate issues of access, retention and progression in elite careers. These approaches make it challenging to identify and address specific social mobility barriers. Other recent research therefore distinguishes between issues of access *into* elite careers and retention and progression *within* these careers to show that even when applicants from lower socio-economic backgrounds ‘get in’, they struggle to ‘get on’: (Friedman & Laurison, 2020; Friedman, Laurison & Miles, 2015; Laurison & Friedman, 2016; Friedman, Laurison & Macmillan, 2017). This paper follows this lead by focussing exclusively on *access* to elite occupations over the first half of an individual’s career, although it extends the concept of access to consider whether individuals ‘ever’ accessed an elite occupation at any time between age 26 and age 42. As the paper shows, this broader definition of access is crucial to understanding the full extent of socio-economic differences in access to elite occupations.

2.2.2 The role of cognitive and non-cognitive skills in access to elite careers

Socio-economic background is known to be a key determinant of early cognitive skills (Feinstein, 2003; Sullivan & Brown, 2013; Crawford, Macmillan & Vignoles, 2017; Jerrim & Vignoles, 2015, Cattan et al., 2022) and non-cognitive skills (Feinstein, 2000; Carneiro, Crawford & Goodman 2007; Blanden, Gregg & Macmillan, 2007; Green et al., 2018; Cattan et al., 2022). These skills have also been shown to be important determinants of labour market success (e.g. Sullivan et al., 2018a; Daly, Egan & O’Reilly 2015; Osborne-Groves, 2005; Jackson, 2006; Heckman, Stixrud & Urzua, 2006; Prevoe & ter Weel 2013; Cattan et al., 2022; Deming, 2017; Hansen et al., 2021) and are therefore potential barriers to children from lower socio-economic backgrounds entering elite occupations in adulthood, especially with the increasing use of competitive multi-stage recruitment processes including psychometric tests for those aspiring to enter professional and managerial occupations (Ashley et al., 2015).

Several papers have identified the role played by both cognitive and non-cognitive skills in transmitting socio-economic advantages from parents to children in the UK (Feinstein, 2000; Carneiro, Crawford & Goodman, 2007; Blanden, Gregg & Macmillan, 2007; Green et al.; 2018). However, these studies focus largely on the average effects of social background and childhood skills on the full distribution of labour market earnings and therefore do not specifically address the issue of socio-economic barriers to elite

occupations. This is an important consideration because recent evidence suggests the relationship between parental and childhood earnings is ‘J-shaped’ rather than linear, indicating that socio-economic advantage is particularly persistent across generations for more affluent families (Gregg, Macmillan & Vittori, 2019). It may therefore be particularly important to consider the role of childhood skills in explaining access to elite occupations, which tend to be well remunerated.

2.2.3 How do childhood skills influence access to elite occupations?

Educational attainment

Several recent papers have explored the role of childhood skills specifically in the intergenerational persistence of elite occupational status. These papers begin by establishing a link between social background and elite occupational outcomes, followed by evidence that some of this relationship can be accounted for by SES disparities in childhood skills which feed through to later educational attainment. For example, focussing on cognitive skills and detailed measures of educational attainment, Sullivan et al. (2018a) demonstrate how these attributes mediate the link between socio-economic background and elite occupational status at age 42. However, they do not incorporate non-cognitive attributes which they state may be important (pp793) and they do not account for degree class or postgraduate degrees which predict employment in elite careers (Donnelly & Gamsu, 2019).

Incorporating both cognitive and non-cognitive attributes, McKnight (2015) shows that maths ability, locus of control and behavioural problems (inversely) are predictive of high incomes (top 20%) and elite occupational status at age 42, and that these attributes mediate the relationship between parent and child outcomes partly via educational attainment. However, this analysis considers a relatively limited selection of childhood cognitive and non-cognitive attributes (self-esteem, locus of control, behaviour, maths and reading ability) and does not account for degree institution, degree class or postgraduate degrees, three notable drivers of access to elite occupations (Sullivan 2018b; Wakeling & Savage, 2015; High Fliers, 2020; Donnelly & Gamsu, 2019). Gugushvili, Bukodi & Goldthorpe (2017) similarly show how cognitive ability and locus of control contribute to explaining the relationship between social class origins and access to the “salaried” – a slightly wider group of occupations - at age 38, but they also do not consider a wider range of non-cognitive ability, nor degree class and institution.

Using a broader range of cognitive ability (IQ, maths, reading) and non-cognitive ability (application, hyperactivity, clumsy, extroversion, anxiety), Gregg, Macmillan & Vittori (2019) show that maths, reading and application skills at age 10 are particularly strong predictors of lifetime income (age 26-42) for children who end up in the top 10% of incomes and that childhood skills partly explain the relationship between parents' and sons' incomes, with some of this effect mediated through educational attainment. However, they do not include daughters; do not consider the role of self-perception, private or grammar schools, degree class or postgraduate education, and also do not focus on the role of elite occupations specifically in propagating these relationships between the lifetime income of parents and sons.

This paper extends this research by using a broader selection of cognitive and non-cognitive attributes than used in other related papers; including both sons and daughters, and incorporating a range of characteristics designed to capture educational experiences and attainment – including private and grammar schooling, elite and non-elite degree institutions, degree class and postgraduate education - which have been shown to be important predictors of labour market success (see Macmillan, Tyler, Vignoles, 2015; McKnight, 2015; The Sutton Trust, 2016; Green, Henseke & Vignoles, 2017; Sullivan 2018b; Wakeling & Savage, 2015; High Fliers, 2020; Donnelly & Gamsu, 2019) but which are not always included in prior literature.

Career self-management

While educational attainment is undoubtedly an important channel by which childhood skills drive access to competitive elite occupations, it is certainly not the whole picture, as evidenced by these skills remaining significant predictors of access to top jobs despite the inclusion of educational controls (Sullivan et al., 2018a; McKnight, 2015; Gugushvilli, Bukodi & Goldthorpe, 2017; Gregg, Macmillan & Vittori, 2019). This paper therefore additionally contributes to the literature by proposing a secondary channel by which these childhood skills may further support access to elite careers, arguing that higher cognitive and non-cognitive ability in childhood may also promote more proactive 'career self-management'.

Career self-management is defined as 'career exploration to form job choices, guidance seeking, networking and work experience' (Okay-Somerville & Scholarios, 2017). These behaviours are encouraged in young people because academic excellence is no longer sufficient for entry to an elite career (Tomlinson, 2008; Wright & Mulvey, 2021; Brown

and Souto-Otero, 2020)²⁵, and career self-management is argued to be important for early career success as applicants must present a ‘narrative of employability’ and demonstrate ‘job readiness’ (Holmes, 2013; Okay-Somerville & Scholarios, 2017; Brown and Hesketh, 2004; Brown and Souto-Otero, 2020; CBI, 2019). Existing evidence already suggests that children from more advantaged backgrounds are more likely to report higher occupational aspirations (Moulton et al., 2018; Green et al., 2018; Ashby & Schoon, 2010; Schoon & Polek, 2011; Croll, 2008; Cabinet Office, 2008); make greater use of networks (Savage et al., 2013; Reeves et al., 2017; Marcenaro-Gutierrez, Micklewright & Vignoles, 2015; Gugushvilli, Bukodi & Goldthorpe, 2017; Green et al., 2018; Total jobs & SMF, 2021; Tholen et al., 2013; Abrahams, 2017; BDO, 2022), and access more work experience opportunities (Sutton Trust 2018a & 2018b; Roberts, 2017, Total Jobs & SMF, 2021; Ashley et al., 2015; Wright and Mulvey, 2021; Bathmaker, Ingram & Waller, 2013). As such, they are known to be better at ‘playing the game’ to gain a positional advantage in the labour market. This paper extends existing work by exploring whether some of this behaviour may be driven by the higher levels of cognitive and non-cognitive attributes possessed by these children. For example, children who are more conscientious or with a greater internal locus of control may be expected to be more proactive in preparing for future careers. Similarly, children with higher cognitive skill might be expected to absorb and retain more general knowledge about the world of work from their environment in the same way they are better at acquiring academic knowledge. Related literature has linked both cognitive ability and non-cognitive traits (emotional and behavioural problems) to career aspirations (Moulton et al., 2018; Schoon & Polek, 2011), but has not yet explored other aspects of career preparation, such as use of networks, work experience or commercial awareness. This paper fills this gap by considering whether childhood skills promote the early formation of aspirations and values; guidance seeking through networks; work experience and commercial awareness during teenage years, and whether this is an important route through which barriers to elite occupations for children from less advantaged backgrounds are created.

²⁵ For example, work experience is increasingly being demanded by employers and used as a recruitment channel. Two-fifths of companies surveyed warned that graduates without work experience were ‘not very likely’ or ‘not at all likely’ to be recruited, regardless of their academic achievements (High Fliers, 2020).

2.2.4 Research questions

Building on related literature, this paper seeks to answer the following questions:

RQ1: How large is the socio-economic gap in access to elite occupations when we consider access at any point between ages 26 and 42?

RQ2: What proportion of the socio-economic gap in access to elite occupations is explained by the wide range of non-cognitive and cognitive skills in childhood considered in this study?

RQ3: Do childhood skills predict teenage career self-management behaviours and therefore improve access to elite occupations for individuals from higher socio-economic backgrounds via this route?

RQ4: Does allowing for wider measures of educational experiences and attainment improve our understanding of the relationship between socio-economic status, childhood skills and access to elite occupations?

RQ5: Do socio-economic disparities in childhood skills make any remaining direct contribution to explaining socio-economic gaps in access to elite occupations, beyond their association with career self-management and education?

2.3 Data

2.3.1 Sample

This analysis uses data from the British Cohort Study (BCS), a longitudinal survey of children born in Great Britain between 5th and 11th April 1970. Data has been collected on 18740 children across nine waves to date (birth and age 5, 10, 16, 26, 30, 34, 38 and 42). This enables us to capture access to elite occupations during the whole of the first half of working lives offering a more comprehensive analysis of socio-economic gaps in access to elite occupations. As discussed below, this is important because the data reveal that only one third of elite jobs are reported by age 26 with the remaining two-thirds of elite occupations reported for the first time between age 30 and 42. Taking a broader perspective on access to elite careers therefore enables us to capture individuals who enter professional careers through ‘non-traditional’ pathways later in their careers, or who progress into management positions which naturally occurs later in their careers, as well as those who may have missing data at one or more waves.

As the analysis is focussed on the intergenerational transmission of elite occupational status, the estimation sample is restricted to 11154 cohort members (5672 males and 5482

females) for whom occupational status data for themselves and their parents is available. This sample is broadly representative of the BCS70 population across the full range of characteristics measured, with only small differences in childhood cognitive skills, non-cognitive traits and later educational attainment levels between those who are and are not included in the analysis (see Table A2.1 for descriptive statistics). We can therefore think of the results as relevant to the national population.

2.3.2 Occupational status

Elite occupations are defined as higher managerial and professional occupations using the Socio-Economic Group (SEG) classification for both parents and children.²⁶ The top four SEG categories are combined to capture employers and managers (both in large establishments) plus professionals (self-employed and employed). Non-elite occupations are defined as all other jobs including being ‘unemployed-looking for work’ to capture all cohort members who are available to access elite or non-elite careers.

A cohort member is defined as having a parent in an elite occupation if either their mother or father reports being employed in an elite occupation when the cohort member is aged 10 or 16. Within the sample, 17.6% of cohort members fall into this category.

Analysis of occupational status by age in adulthood reveals that the overall proportion of cohort members employed in an elite occupation remains very stable across different ages, ranging from 16.5% to 18.3% (Table 2.1). However, at an individual level there appears to be substantial movement into and out of the elite category as a quarter (24.2%) of all individuals report being employed in an elite occupation and a non-elite occupation at different times during the first half of their career (age 26 to 42 years). Therefore, in order to create a more comprehensive measure of access to elite occupations, the five waves of data from age 26 to 42 are combined to establish if the cohort member has *ever* (i.e. at least once) accessed an elite occupation during this time. Overall, 30.2% of cohort members have accessed an elite occupation at least once in adulthood (age 26 to 42) compared to 69.8% who have never accessed an elite occupation in adulthood. This confirms that single snap-shot measures of occupational status – which are common in

²⁶ NS-SEC is the current preferred measure of occupational status in the UK however it is only available in BCS70 data from age 34 onwards and therefore does not capture early career outcomes which limits analysis of access to elite occupations. It is also unavailable for parents. Instead SEG data is used which aligns closely with NS-SEC. Specifically, the top four groups of SEG used (1.1, 1.2, 3, 4) align with the Class 1 category in the seven-class Goldthorpe Schema (professional, administrative and managerial employees – higher grade) (Goldthorpe and Jackson, 2007, p529) which subsequently aligns with Class 1 of NS-SEC8 (higher managerial and professional occupations) (Goldthorpe and McKnight, 2006).

the existing literature - underestimate the proportion of individuals accessing elite occupations in adulthood by almost a half (such as 17.9% in elite jobs at age 42 versus 30.2% ever accessing these jobs).

Combining multiple waves also allows an occupational outcome measure to be created for substantially more individuals (who also have parental occupational data) than is possible when using only of wave of data (11154 versus approximately 6500 to 8500). This is particularly important for daughters who traditionally are more likely to be excluded from snapshot analysis due to periods out of the labour market during the middle of their careers (e.g. Blanden, Gregg & Macmillan, 2007).

Table 2.1: Occupational status by age of cohort member

Occupational status	Age of cohort member					Ever
	26	30	34	38	42	26-42
Elite	1169	1542	1224	1278	1370	3366
	<i>17.8%</i>	<i>18.2%</i>	<i>16.5%</i>	<i>18.3%</i>	<i>17.9%</i>	<i>30.2%</i>
Non-elite	5404	6944	6177	5698	6278	7788
	<i>82.2%</i>	<i>81.8%</i>	<i>83.5%</i>	<i>81.7%</i>	<i>82.1%</i>	<i>69.8%</i>
Total	6573	8486	7401	6976	7648	11154
<hr/>						
Newly elite (non-elite or missing in prior waves)	1169	1068	455	363	311	3366
<i>% of sample</i>	<i>10.5%</i>	<i>9.6%</i>	<i>4.1%</i>	<i>3.3%</i>	<i>2.8%</i>	<i>30.2%</i>
Non-elite, but report elite in at least one other wave	1190	1349	1394	1252	1277	2699
<i>% of wave total</i>	<i>18.1%</i>	<i>15.9%</i>	<i>18.8%</i>	<i>17.9%</i>	<i>16.7%</i>	<i>24.2%</i>

2.3.3 Measures of childhood characteristics

Childhood skills (age 10)

Building on related literature (McKnight, 2015; Sullivan et al., 2018a; Gugshvilli, Bukodi & Goldthorpe, 2017; Gregg, Macmillan and Vittori, 2019), this paper considers the role of a broader range of childhood cognitive and non-cognitive skills in creating SES barriers to elite occupations. A range of measures of these skills are captured in the BCS70 ten year follow up survey (the 1980 Child Health and Education Study) (Butler et al., 1980). Cognitive skills usually refer to measures of general intelligence or IQ, and include components such as learning, memory and reasoning (Heckman, 2011), however the development of these cognitive skills is often helped by possessing a range of non-cognitive skills such as motivation, perseverance and confidence (Joshi, 2014; Heckman and Kautz, 2012; Heckman, Stixrud & Urzua 2006; Duckworth & Seigelman, 2005). These interrelationships therefore lend support to the inclusion of both non-cognitive and

cognitive skills in any analysis of SES barriers to elite careers. As highlighted in Feinstein (2000) a correlation matrix of age 10 skills confirms that non-cognitive traits are associated with cognitive ability but are not collinear with them and therefore provide useful additional information about childhood development (see Table A2.2).

Cognitive ability in childhood is measured using scores from all five cognitive tests included in the age 10 survey: reading, maths, British Ability Scale (a proxy for IQ), language comprehension and spelling. Non-cognitive skills in childhood are captured by seven measures using the broad concepts of self-perception and awareness (represented by locus of control, self-esteem and academic self-concept); self-control and regulation (represented by externalising behaviour and application); social skills (such as being popular and cooperative with peers) and emotional behaviour (such as being worried or miserable). This approach mirrors the most recent attempt to streamline the approach to defining and measuring childhood non-cognitive skills specifically using BCS70 data (Goodman et al., 2015) and builds on previous work on defining and categorizing non-cognitive traits (Gutman & Schoon, 2013; Humphrey et al., 2010; McNeil et al., 2012). These measures of childhood skills are standardised across the BCS70 population (to mean of zero and standard deviation of one). Further detail on the construction of these measures is available in Appendix A2.3.

Education (age 16+)

Following related literature which shows that non-cognitive and cognitive ability influence labour market outcomes through later educational attainment (McKnight, 2015; Sullivan et al., 2018a; Gugshvilli, Bukodi & Goldthorpe, 2017; Gregg, Macmillan and Vittori, 2019), a range of standard school and university qualifications have been included in the analysis, alongside additional measures of private or grammar schooling, degree institution, degree class and postgraduate education which are often excluded in this related literature but are known to be important predictors of labour market success (see Macmillan, Tyler, Vignoles, 2015; McKnight, 2015; Green, Henseke & Vignoles, 2017; Sutton Trust, 2016, Sullivan 2018b; Wakeling & Savage, 2015; High Fliers, 2020; Donnelly & Gamsu, 2019).

Specifically, school qualification data captures the number of GCSEs (A-C) or equivalents and number of A-levels (A-C) or equivalents. Undergraduate qualifications are measured by a single categorical variable reflecting the interaction of the type of degree institution (Russell Group or non-Russell Group) and degree class (first- and

upper-second class degree or lower-second, third, pass degree), versus the base category of not obtaining an undergraduate degree. Postgraduate qualifications are captured by a binary variable reflecting whether (or not) the cohort member obtained a higher degree (masters or PhD). Educational attainment measures are captured across several survey waves (school and university qualifications at age 26; degree class at age 30 and degree institution at age 42) which overlap with the measurement period for access to elite occupations (age 26-42). Education measures are therefore restricted to those obtained before age 26 using qualification date information. Due to the prevalence of privately educated individuals employed within elite occupations and also the influence of private school on educational attainment (Sullivan, et al., 2014), a school type variable has been included to identify individuals from the age 42 survey who attended private school, grammar school or (non-academically selective) state school when aged 16.

Career self-management (age 16)

This paper explores a second route, in addition to education, by which early childhood skills may influence elite occupational outcomes through career self-management behaviours during teenage years (age 16). These attributes relate to the period between the measurement of childhood skills (age 10) and educational qualifications (age 16+) and comprise the following measures which are available in the age 16 BCS70 survey.

- Aspirations

Aspirations are represented by five measures relating to elite occupations taken from the age 16 survey: four job characteristics and one occupational aspiration. Firstly, the survey captures which job characteristics matter to students in their future career. Four of these characteristics (out of a list of 16) have been selected for inclusion in this analysis due to their particular relevance to elite occupations, specifically, to what extent the students value a high wage, promotion, challenge and long-term security. Other job characteristics such as working outside, having a quiet life or building things were excluded as being less relevant to competitive elite careers. The aspirations are each coded as a binary variable for which the responses ‘matters very much’ and ‘matters somewhat’ are combined to represent the aspiration, and ‘does not matter’ represents the base category for that aspiration. Secondly, the survey also captures occupational aspirations (from a list of 17 options), one of which is ‘professional (needing a degree)’. Individuals who chose a professional career as their first choice or ‘might do’ choice are defined as having

professional aspirations. The base category for this binary variable is therefore individuals with non-professional aspirations.

- *Networks*

A broad measure of the use of networks for guidance in childhood is created from the age 16 survey which asks ‘who has helped/advised you about jobs, careers and further education?’. This is a purposefully wider definition of networks to that used in related literature (such as Marcenaro-Gutierrez, Micklewright & Vignoles, 2015; Green et al., 2018; Macmillan, Tyler & Vignoles, 2015; Gugushvilli, Bukodi & Goldthorpe, 2017) which is often more focussed on networks as a direct route to employment (such as help with application forms, acting as a reference, or recommending the individual to an employer), rather than the broader notion used here of a support network guiding young people through the education system in preparation for entering the labour market.²⁷

The survey response categories have been grouped into personal networks only (parents, siblings, other family members and friends), educational networks only (careers officer, careers teacher, other teacher, further education college staff and school library), both personal and educational networks, or none of these networks. As all children have access to some form of educational network (even if unused), this is used as the base category (rather than ‘no network’ which is small at only 2% of the sample). This also allows a comparison of using only educational networks versus using a broader range of networks (both educational and personal).

- *Work experience*

The work experience variables capture two measures of exposure to the workplace by age 16: school work experience and commercial awareness. The school work experience variable captures binary responses to the question “Since September 1984 have you taken part in any work experience arranged by the school?”. This is a direct measure of work

²⁷ Two narrower alternative measures of networks within the BCS70 data were deliberately not chosen for this analysis. Firstly, the age 16 survey captures access to networks (family or other contact) who can directly provide employment or help the child secure a job. This measure relies on teenagers being able to foresee specific employment opportunities their networks could provide in adulthood, however it was used in Green et al (2018) and shown not to predict age 42 hourly earnings. Secondly, the age 42 survey captures parental help when seeking employment but has been shown to suffer from recall issues (Marcenaro-Gutierrez, Micklewright & Vignoles, 2015) and fails to explain the relationship between parental and child occupational status (Gugushvilli, Bukodi & Goldthorpe (2017). It is also problematic for this analysis as the period of help (‘ever’) overlaps the outcome period (age 26-42) rather than precedes it.

experience undertaken by the child since being 14.5 years old, therefore children with no work experience form the base category.

The commercial awareness variable reflects scores from the work-related sections of the ‘Moving On’ test (44 questions out of 72) which are summed and standardised across the BCS70 population to mean of zero and standard deviation of one. These questions assess children’s knowledge about applying for a job and interviews, starting work, being out of work, how organisations work, being employed and being self-employed. Three remaining sections are excluded due to not being work related (renting a flat, the law and life in the community). This measure of commercial awareness therefore captures a child’s broad knowledge of the workplace (not specifically knowledge of elite occupations) at age 16 which may be developed from a wider variety of influences including family, school and/or work experience. To my knowledge, these two sources of work experience and commercial awareness data from the BCS70 survey have not yet been used in social mobility research.

Controls and missing data

Children from elite and non-elite backgrounds may also differ in other ways which are not captured by these three groups of characteristics, but which may influence their chances of accessing elite jobs. Demographic controls have therefore been included for gender, ethnicity, region of origin (UK regions or international) and parental age. Age controls are not required for cohort members who were all born in the same week in 1970. A control has also been included for the number of survey waves in which each individual was present (from one to five).

Dummy variables have also been included to reflect missing data in explanatory variables which occurs either due to cohort members not being present in the survey wave(s) in which the characteristics are captured or being present for the survey but not responding to the specific question. Missing data for explanatory characteristics is imputed as the mean value of characteristics for children with the same parental occupational status to avoid distorting the Stage 1 results.

2.4 Methodology

2.4.1 SES disparities in access to elite occupations

This paper firstly addresses RQ1, estimating the association between the occupational status of parents and their children (in adulthood) which is identified by β in Equation 1.

$$\text{Model 0: } \quad \textit{elite}^{\textit{child}} = \alpha + \beta \textit{elite}^{\textit{parent}} \quad (1)$$

As the occupational status variables are binary (elite or non-elite) for both parents and children, β represents the increased chances (in percentage point terms) of a child accessing an elite occupation in adulthood if they had a parent employed in an elite occupation rather than a non-elite occupation, in childhood. This is therefore an estimate of the socio-economic gap in access to elite occupations or the extent to which elite occupational status persists across generations. No controls are included in Model 0.

2.4.2 Decomposition approach

The β coefficient is subsequently decomposed using a Blinder-Oaxaca decomposition²⁸ (Blinder, 1973; Oaxaca, 1973; Jann, 2008) to identify the relative contributions of non-cognitive skills and cognitive skills to the transmission of elite occupational status between generations. This decomposition method is used to decompose differences in mean outcomes between two groups, in this case, the probability of accessing an elite occupation in adulthood, between children with and without parents employed in an elite occupation. This approach decomposes the intergenerational persistence of elite occupational status into the relationship between parental occupation and childhood skills multiplied by the return to these childhood skills (in terms of occupational outcomes), plus the unexplained persistence in elite occupations which is not transmitted through these childhood skills. This is a standard method used in related social mobility literature (Blanden, Gregg & Macmillan, 2007; Green et al., 2012; Blanden, Gregg and Machin, 2005; Macmillan, 2013; Laurison & Friedman, 2016).

The decomposition involves two stages: firstly estimating the association between parental occupational status and childhood skills (Stage 1) and secondly estimating the association between these childhood skills and accessing an elite occupation in adulthood (conditional on parental occupational status) (Stage 2). Larger associations in Stages 1 and 2 result in the childhood characteristic being identified as a key mechanism by which elite occupational status is transmitted between generations.

Considering initially the role of a single childhood skill only (\textit{skill}_1), β can be split into two elements. Firstly, the association between parental occupational status and the child's skill, is denoted by π_1 in Equation 2 (Stage 1) and represents the difference between the mean skill score for children from elite backgrounds and those from non-elite backgrounds. Secondly, the association between the child's skill and their own

²⁸ Using the 'oaxaca' command in Stata (Jann, 2008) with probit specifications as the outcome is binary.

occupational status in adulthood (conditional on parental occupational status) is denoted by λ_I in Equation 3 (Stage 2). (This model is conditional on parental occupational status due to the need to remove the effect of parental occupational status on the skills coefficients as this effect is identified in Stage 1.)

$$\text{Stage 1:} \quad \text{skill}_I = \alpha_I + \pi_I \text{elite}^{\text{parent}} \quad (2)$$

$$\text{Stage 2:} \quad \text{elite}^{\text{child}} = \alpha_2 + \lambda_I \text{skill}_I + \delta \text{elite}^{\text{parent}} \quad (3)$$

Substituting Equation 2 into Equation 3 and rearranging to obtain $\text{elite}^{\text{child}} = (\alpha_2 + \alpha_I \lambda_I) + (\pi_I \lambda_I + \delta) \text{elite}^{\text{parent}}$ produces Equation 4 (the decomposition result). The overall intergenerational persistence of elite occupational status (β) therefore equates to $(\lambda_I \pi_I + \delta)$ which comprises the portion explained by the single childhood skill ($\lambda_I \pi_I$) and the portion which remains unexplained by this skill (δ).

$$\text{Decomposition:} \quad \beta = \pi_I \lambda_I + \delta \quad (4)$$

2.4.3 Model specifications

In addition to Model 0 (Equation 1 above), a further three model specifications are used in this analysis and are built sequentially by age. The first (Model 1) includes childhood skills at age 10, the second (Model 2) includes measures of teenage career management behaviour (aspirations, networks and work experience) at age 16 and the third (Model 3) includes educational attainment at school and university from age 16 onwards. All controls are included in these models.

Childhood skills (Model 1, age 10) – RQ2

Model 1 estimates the role of a range of childhood non-cognitive and cognitive skills in explaining SES gaps in access to elite occupations (RQ2). This requires Stage 1 models being run for each childhood skill (Equation 5) and the Stage 2 model being expanded to include the full range of non-cognitive and cognitive skills (Equation 6). The proportion of the SES gap in access to elite occupations (β) which is explained by this group of skills is therefore given by $\sum_{s=1}^S \pi_s \lambda_s$ in Equation 7). This reflects the extent to which this group of skills allows higher SES children to replicate the elite status of their parents.

$$\text{Stage 1 (Model 1):} \quad \text{skill}_s = \alpha + \pi_s \text{elite}^{\text{parent}} \quad (\text{for all } s) \quad (5)$$

$$\text{Stage 2 (Model 1):} \quad \text{elite}^{\text{child}} = \alpha + \sum_{s=1}^S \lambda_s \text{skill}_s + \delta \text{elite}^{\text{parent}} \quad (6)$$

$$\text{Decomposition (Model 1):} \quad \beta = \sum_{s=1}^S \pi_s \lambda_s + \delta \quad (7)$$

This analysis also identifies which specific skills are the most important transmitters of elite occupational advantage between generations. Skills which are not identified as being significant transmitters of advantage in Model 1 are not considered further.

Career self-management (Model 2, age 16) – RQ3

Model 2 considers whether higher levels of the key childhood skills (as identified from Model 1) may feed through to more favourable aspirations, use of networks and work experience during teenage years resulting in greater access to elite occupations in adulthood for children from higher socio-economic status (SES) backgrounds (RQ3). The decomposition is therefore expanded to include these variables. This requires additional Stage 1 models being run for each component of teenage career management behaviour (aspirations, networks and work experience) (Equation 8) and the Stage 2 model also being expanded to include these characteristics (Equation 9).

$$\text{Stage 1 (Model 2):} \quad \text{career}_c = \alpha + \pi_c \text{elite}^{\text{parent}} \quad (\text{for all } c) \quad (8)$$

$$\begin{aligned} \text{Stage 2 (Model 2):} \quad \text{elite}^{\text{child}} &= \alpha + \sum_{s=1}^S \lambda_s \text{skill}_s + \sum_{c=1}^C \lambda_c \text{career}_c \\ &+ \delta \text{elite}^{\text{parent}} \end{aligned} \quad (9)$$

$$\text{Decomposition (Model 2):} \quad \beta = \sum_{s=1}^S \pi_s \lambda_s + \sum_{c=1}^C \pi_c \lambda_c + \delta \quad (10)$$

Any reductions in the contribution of the key childhood skills (from Model 1 to Model 2) to explaining SES gaps in elite occupations therefore suggest that these childhood skills may operate through teenage career management behaviour to improve access to elite occupations for children from elite backgrounds. To investigate this route in more detail, separate models are run to identify associations between childhood skills and aspirations, networks and work experience. This identifies which specific teenage career self-management behaviours are predicted by the key childhood skills.

$$\text{Transmission route (Model 2):} \quad \text{career}_c = \alpha + \lambda_s \text{skill}_s \quad (11)$$

Education (Model 3, age 16+) – RQ4 & RQ5

Model 3 repeats the approach from Model 2 to additionally incorporate measures of education at GCSE, A-level, undergraduate and postgraduate levels and also school type. Model 3 therefore considers whether higher levels of the key childhood skills (as identified from Model 1) may feed through to higher educational attainment resulting in greater access to elite occupations in adulthood for higher SES children (RQ3). Stage 1

models are run for each educational attainment measure (Equation 12) and the Stage 2 model is expanded to include these measures (Equation 13).

$$\text{Stage 1 (Model 3):} \quad \text{education}_e = \alpha + \pi_e \text{elite}^{\text{parent}} \quad (\text{for all } e) \quad (12)$$

$$\begin{aligned} \text{Stage 2 (Model 3):} \quad \text{elite}^{\text{child}} &= \alpha + \sum_{s=1}^S \lambda_s \text{skill}_s + \sum_{c=1}^C \lambda_c \text{career}_c \\ &+ \sum_{e=1}^E \lambda_e \text{education}_e + \delta \text{elite}^{\text{parent}} \end{aligned} \quad (13)$$

$$\text{Decomposition (Model 3):} \quad \beta = \sum_{s=1}^S \pi_s \lambda_s + \sum_{c=1}^C \pi_c \lambda_c + \sum_{e=1}^E \pi_e \lambda_e + \delta \quad (14)$$

Any further reductions in the contribution of the key childhood skills (from Model 2 to Model 3) to explaining SES gaps in elite occupations therefore suggest that these childhood skills may operate through educational characteristics to improve access to elite occupations for children from elite backgrounds. To investigate this educational route in more detail, separate models are run to identify associations between childhood skills and educational attainment. This identifies which specific elements of educational attainment are predicted by the key childhood skills.

$$\text{Transmission route (Model 3):} \quad \text{education}_e = \alpha + \lambda_s \text{skill}_s \quad (15)$$

The contributions of childhood skills observed in the Model 3 decomposition reflect the remaining direct contribution they make to explaining SES gaps in access to elite occupations, beyond their association with career self-management and education (RQ5).

The unexplained portion of β (denoted by δ) in the final model (Model 3) represents the remaining direct association between parental and child occupational status (in Stage 2) which is not explained by the characteristics and controls included in the model. This could be attributed to differences in other unobserved characteristics between children from elite and non-elite backgrounds or to direct discrimination by socio-economic background.

2.5 Results

2.5.1 SES disparities in access to elite occupations (RQ1)

Overall, a third (30.2%) of children access an elite occupation at least once in the first half of their career (age 26 to 42), however this access varies substantially by social background. Almost half (49.6%), of all children from elite backgrounds enter an elite occupation in adulthood compared to only a quarter (26.0%) of all children from non-elite backgrounds (Table 2.2). Children with a parent employed in an elite occupation are therefore twice as likely (23.6ppts) to enter an elite occupation than their more advantaged

peers. Notably, the figures also show that many elite occupations are accessed by individuals whose families do not have first-hand experience of these careers (n=2389, 21.4% of the sample). In fact, over two thirds (71.0%, n=2389/3366) of children who access top jobs originate from non-elite families. However, despite this evidence of upward mobility into elite occupations, there is a clear advantage to having parents with experience of elite careers. The role of childhood cognitive ability and non-cognitive skills in explaining SES disparities in access to elite occupations is the focus of the following analysis.

Table 2.2: Chances of accessing an elite occupation (ever) or reporting a non-elite occupation (always) in adulthood (age 26-42), by parental occupation.

Parent occupation	Child occupation in adulthood		
	Elite	Non-Elite	Total
Elite	977 <i>49.6%</i>	991 <i>50.4%</i>	1968 <i>100.0%</i>
Non-Elite	2389 <i>26.0%</i>	6797 <i>74.0%</i>	9186 <i>100.0%</i>
Total	3366 <i>30.2%</i>	7788 <i>69.8%</i>	11154 <i>100.0%</i>

2.5.2 What proportion of the SES gap in access to elite occupations is explained by non-cognitive and cognitive skills in childhood? (RQ2)

The decomposition analysis (presented in Table 2.3) demonstrates the important role of childhood non-cognitive and cognitive ability in explaining the SES disparity in access to elite occupations. The starting point for the analysis is the initial finding that children with a parent employed in an elite occupation are 23.6pppts more likely to enter an elite occupation than children with a parent employed in a non-elite occupation (Model 0).

The contributions of childhood cognitive and non-cognitive skills to explaining this finding are driven by differences in the mean value of these skills between children from elite and non-elite backgrounds (from Stage 1) and these skills being significant predictors of elite occupational status in adulthood (from Stage 2). In Stage 1, there are significant SES gaps in the mean value of all cognitive and non-cognitive skills, ranging from 0.2-0.6 of a standard deviation (Table A2.4). In Stage 2, seven childhood attributes are predictive of elite occupational outcomes (Model 1). These are the non-cognitive traits

of locus of control; (lower) externalising behaviour and application and social skill; and cognitive ability in maths, reading and language comprehension (Table A2.5). Children who rank one standard deviation higher than their peers on each of these seven predictive attributes have a 19.2ppt higher chance of accessing an elite career in adulthood (sum of the relevant marginal effects in Table A2.5). Considering that 30.2% of children enter an elite occupation at least once in adulthood, this represents a substantial advantage which is already present by age 10.

The remaining skills (self-esteem, academic self-concept, emotionality, BAS and spelling) are not significantly predictive of access to elite occupations in Stage 2 and therefore are not discussed further as they do not explain the transmission of occupational advantage between generations for this sample (although they are still included in the decomposition analysis for completeness).

Combining the Stage 1 and Stage 2 effects, the decomposition analysis shows that by age 10 differences in mean non-cognitive and cognitive skills between children from elite and non-elite backgrounds can already explain almost two-fifths (37.2%) of the transmission of elite occupational status between generations (Model 1). Specifically, non-cognitive skills account for 12.6% and cognitive skills account for 24.7%. The contribution of maths ability is notably large (12.1%), followed by measures of literacy (reading and language comprehension, 11.7%), self-control (application and lower externalising behaviour, 6.4%) and locus of control (4.5%). Social skills are relatively less important (0.7%).

From a methodological perspective, these results confirm the value of analysing occupational outcomes over multiple waves of data rather than one snapshot mid-career which is common in related literature. For example, using occupational status at age 42 only would largely identify the same childhood characteristics as being important²⁹ but would understate the contribution they make to explaining SES barriers to elite careers (a contribution of 32.6% compared to 37.2% in this paper). This occurs because some of these skills (such as locus of control, application and language comprehension) appear more important in earlier career years which is overlooked by using age 42 data only. This was established by running the decomposition for Model 1 for each of the five waves (age 26, 30, 34, 38 and 42) separately (see Appendix Table A2.7 for results).

²⁹ The only differences are that at age 42 academic self-concept makes a small but significant 1.0% contribution to explaining SES gaps in elite occupations, however social skills are non-significant.

Table 2.3: Decomposition of the SES gap in access to elite occupations ‘ever’ (β)

	Model 0				Model 1				Model 2				Model 3			
	Coeff	S.E	Sig.	%	Coeff	S.E	Sig.	%	Coeff.	S.E	%	Coeff.	S.E	Sig.	%	
Childhood skills - age 10																
<i>Non-cognitive skills</i>																
Self-perception																
- Locus of control					0.011	0.003 ***		4.5%	0.009	0.003 ***		3.9%	0.005	0.003 *		2.2%
- Self esteem					0.001	0.001		0.2%	0.000	0.001		0.2%	0.000	0.001		0.1%
- Academic self concept					0.001	0.001		0.6%	0.001	0.001		0.5%	0.001	0.001		0.3%
Self-control																
- Externalising behaviour					0.005	0.002 ***		2.1%	0.004	0.002 ***		1.8%	0.002	0.002		1.0%
- Application					0.010	0.002 ***		4.3%	0.008	0.002 ***		3.3%	0.005	0.002 **		2.1%
Social Skills					0.002	0.001 *		0.7%	0.002	0.001 **		1.0%	0.003	0.001 ***		1.2%
Emotional					0.000	0.001		0.1%	0.001	0.001		0.2%	0.001	0.001		0.4%
Total non-cognitive skills					0.030	0.004 ***		12.6%	0.026	0.004 ***		10.9%	0.018	0.004 ***		7.4%
<i>Cognitive skills</i>																
Reading					0.014	0.005 ***		5.8%	0.010	0.005 **		4.3%	0.006	0.005		2.4%
Maths					0.029	0.005 ***		12.1%	0.025	0.005 ***		10.6%	0.019	0.005 ***		7.9%
British ability scale					0.004	0.003		1.6%	0.003	0.004		1.1%	0.000	0.004		-0.1%
Language comprehension					0.014	0.003 ***		6.0%	0.011	0.003 ***		4.9%	0.007	0.003 **		2.9%
Spelling					-0.002	0.002		-0.8%	-0.001	0.002		-0.3%	-0.002	0.003		-0.9%
Total cognitive skills					0.058	0.005 ***		24.7%	0.049	0.005 ***		20.5%	0.029	0.005 ***		12.2%
Total childhood skills					0.088			37.2%	0.074			31.4%	0.046			19.7%
Career self-management - age 16																
<i>Aspirations</i>																
High wage									0.000	0.000		0.1%	0.000	0.000		0.1%
Promotion									0.002	0.001		0.8%	0.002	0.001		0.8%
Challenge									0.004	0.001 ***		1.7%	0.003	0.001 ***		1.3%
Security									0.002	0.001 **		0.8%	0.002	0.001 *		0.8%
Professional									0.027	0.003 ***		11.4%	0.012	0.003 ***		5.2%
Total aspirations									0.035	0.003 ***		14.8%	0.019	0.003 ***		8.2%
<i>Networks</i>																
No network									0.000	0.000		0.0%	0.000	0.000		0.1%
Personal network only									-0.001	0.001		-0.4%	-0.001	0.001 *		-0.4%
Educational and personal networks									0.004	0.002 **		1.7%	0.004	0.002 **		1.6%
Total networks									0.003	0.001 ***		1.3%	0.003	0.001 **		1.2%
<i>Work experience</i>																
School work experience									0.001	0.001		0.4%	0.000	0.001		0.0%
Commercial awareness									0.012	0.003 ***		4.9%	0.008	0.003 ***		3.5%
Total work experience									0.013	0.003 ***		5.3%	0.008	0.003 **		3.4%
Total career self-management									0.051			21.5%	0.030			12.8%
Education - age 16+																
<i>School type</i>																
Private school													0.008	0.003 **		3.5%
Grammar school													0.001	0.001		0.4%
Total school type													0.009	0.003 ***		3.8%
<i>Attainment</i>																
Number of GCSEs grade A-C (and equivalents)													0.037	0.005 ***		15.8%
Number of A-levels grade A-C (and equivalents)													0.008	0.005		3.4%
Degree * Russell * 1st, 2:1													0.009	0.002 ***		3.8%
Degree * Russell * 2:2, 3rd, pass													0.004	0.001 ***		1.7%
Degree * Non Russell * 1st, 2:1													0.010	0.002 ***		4.2%
Degree * Non Russell * 2:2, 3rd, pass													0.007	0.002 ***		2.9%
Degree * No Inst. * 1st, 2:1													0.006	0.001 ***		2.3%
Degree * No Inst. * 2:2, 3rd, pass													0.004	0.001 ***		1.9%
Higher degree													0.002	0.001 *		1.0%
Total attainment													0.087	0.006 ***		37.0%
Total education													0.096			40.8%
Controls					0.017	0.003 ***		7.4%	0.017	0.003 ***		7.3%	0.017	0.003 ***		7.4%
Missing					0.000	0.001		0.0%	0.003	0.001 **		1.3%	0.007	0.002 ***		3.0%
Proportion explained					0.105	0.005 ***		44.6%	0.145	0.007 ***		61.5%	0.198	0.008 ***		83.6%
Proportion unexplained (δ)	0.236	0.012 ***		100.0%	0.131	0.013 ***		55.5%	0.091	0.013 ***		38.5%	0.039	0.013 ***		16.5%
Total persistence (β)	0.236	0.012 ***		100.0%	0.236	0.012 ***		100.0%	0.236	0.012 ***		100.0%	0.236	0.012 ***		100.0%
N	11154				11154				11154				11154			

*** 99% confidence ** 95% confidence * 90% confidence

Controls for gender, ethnicity, UK region of origin, non-UK, mother's and father's age at birth and number of survey waves present.

The focus now turns to assessing two routes through which the seven predictive childhood skills may enable access to elite occupations, namely career self-management and educational attainment.

2.5.3 Do childhood skills predict teenage career self-management behaviours and therefore improve access to elite occupations for higher SES children via this route? (RQ3)

Incorporating measures of career self-management at age 16 in Model 2 suggests that the key non-cognitive and cognitive skills identified in Model 1 may indirectly operate through relatively early career self-management behaviours as children begin to orientate themselves towards their preferred careers during their teenage years. This is shown by the reduction in the contributions from Model 1 to Model 2 (Table 2.3) for six of the seven key childhood skills (locus of control, lower externalising behaviour, application, maths, reading and language comprehension, with social skill being the exception), and the reduction in the total contribution of childhood skills (from 37.2% to 31.4%).

To investigate this in more detail, separate models are run to identify which specific teenage career self-management behaviours are predicted by the key childhood skills. Only teenage behaviours which make a significant contribution to explaining SES gaps access to elite careers are considered here as they are more probable routes by which childhood skills may improve access to elite careers for higher SES children. Specifically, Model 2 of the decomposition shows that SES gaps in access to elite occupations can be partly explained by higher SES teenagers being more likely to seek challenge and security in their future career; to aspire to become a professional (requiring a degree); to use both educational and personal networks (rather than educational networks only) for career or educational advice; and to demonstrate greater commercial awareness. The extent to which the seven key childhood skills predict these five teenage career self-management behaviours is shown in Table 2.4.

This firstly reveals particularly strong associations between age 10 attributes and having professional aspirations (or not) and higher commercial awareness (in standard deviations) at age 16. Non-cognitive traits of self-perception, self-control and *lower* levels of social skill are notably predictive of these outcomes. Cognitive ability in maths, reading and language comprehension are also strongly predictive of these outcomes. Secondly, the age 10 attributes also predict challenge-seeking values at age 16 and have smaller but significant associations with valuing job security in a future career and using multiple networks for career or educational advice.

Table 2.4: Associations between key childhood skills (age 10) and teenage career self-management characteristics (age 16)

	Age 16 career related characteristics														
	Value Challenge			Value Security			Professional aspirations			Ed. & Pers networks			Commercial aware. (s.d.)		
	Coeff.	Std.Err	Sig.	Coeff.	Std.Err	Sig.	Coeff.	Std.Err	Sig.	Coeff.	Std.Err	Sig.	Coeff.	Std.Err	Sig.
<i>Childhood skills - age 10</i>															
<i>Non cognitive skills</i>															
Locus of Control	0.020	0.007	***	0.004	0.005		0.041	0.010	***	-0.002	0.005		0.052	0.020	***
Externalising behaviour	0.000	0.007		-0.004	0.005		-0.040	0.010	***	-0.011	0.005	**	-0.100	0.019	***
Application	0.023	0.008	***	-0.005	0.006		0.071	0.011	***	0.008	0.005		0.128	0.021	***
Social skills	-0.013	0.006	**	0.009	0.005	*	-0.041	0.009	***	0.010	0.004	**	-0.041	0.018	**
<i>Cognitive skills</i>															
Reading	0.030	0.010	***	0.020	0.007	***	0.044	0.014	***	-0.006	0.007		0.204	0.028	***
Maths	0.000	0.010		-0.009	0.007		0.097	0.013	***	0.009	0.006		0.101	0.026	***
Language comprehension	0.022	0.007	***	0.008	0.005		0.036	0.010	***	0.002	0.005		0.129	0.020	***
N	4683			4692			5391			4789			3624		
R. Sq.	0.038			0.043			0.123			0.055			0.275		
*** 99% confidence ** 95% confidence * 90% confidence															

Controls are the same as Model 2 - parental occupational status, gender, ethnicity, UK region of origin, non-UK, mother's and father's age at birth, number of and survey waves present. All models also include the remaining non-cognitive (self-esteem, academic self-concept, emotional) and cognitive (BAS, spelling) skills.

These results suggest that early childhood skills may lay some of the foundations for career self-management, notably the formation of professional aspirations, commercial awareness and challenge-seeking values (and also to a lesser extent valuing job security and using multiple networks). Therefore, not only do higher SES children benefit directly from their valuable non-cognitive and cognitive ability (these attributes remain predictive in Model 2), but they also display early signs of career self-management during their teenage years which are additionally rewarded in the elite labour market. This may partly explain why some young people are more ‘work ready’ than others when they eventually enter the labour market.

Social skills are a notable exception to these findings as they are *inversely* related to professional aspirations, challenge-seeking and commercial awareness (although they do show small positive associations with seeking security in a future career and with using multiple network sources). The conclusion to be drawn from this is that although social skills predict access to elite occupations, they do not substantially operate through career self-management to improve access to elite occupations. SES gaps in social skills therefore do not appear to substantially drive SES gaps in career self-management. This explains the increase in the contribution of social skills in Model 2 (Table 2.3).

This analysis has shown that early SES gaps in six specific non-cognitive and cognitive skills (locus of control, application, lower externalising behaviour and cognitive ability in maths, reading and language comprehension) are likely to contribute to SES gaps in teenage career self-management behaviour. This is therefore an important route by which higher SES children maintain the occupational advantage of their parents and highlights the value of incorporating measures of career self-management into the study of access to elite occupations. These conclusions are also robust to the inclusion of all educational controls (attainment and school type).

The decomposition additionally reveals some effects of career self-management which are *unrelated* to childhood skills (and unrelated to education). Career self-management measures account for 12.8% of the transmission of elite occupational status between generations, over and above the effects of childhood skills (and education and control variables) (Model 3). This contribution largely relates to SES disparities in professional aspirations (5.2% contribution) and commercial awareness (3.5% contribution) (Table A2.6). This is further evidence that measures of career self-management are valuable additions to the study of access to elite occupations as they directly represent barriers to these careers for lower SES children, over and above other skill and educational barriers.

In fact, these measures add 6.1% to the overall proportion of the SES gap in access to elite occupations which is explained by the decomposition (the overall proportion of the SES gap explained reduces from 83.6% in Model 3 to 77.5% if these career self-management variables are removed).

2.5.4. Does allowing for wider measures of educational experiences and attainment improve our understanding of the relationship between socio-economic status, childhood skills and access to elite occupations? (RQ4)

Incorporating measures of educational attainment from age 16 onwards (Model 3) firstly confirms general findings elsewhere that both non-cognitive traits and cognitive ability support educational attainment (Blanden, Gregg & Macmillan, 2007; McKnight, 2015; Sullivan et al., 2018a; Gugshvilli, Bukodi & Goldthorpe, 2017; Gregg, Macmillan and Vittori, 2019; Adamecz,-Volgyi, Henderson & Shure, 2021). The analysis also confirms that this is an important route by which higher SES children, with higher cognitive and non-cognitive skills, gain greater access to elite occupations. This is shown by the reduction in the contributions from Model 2 to Model 3 (Table 2.3) for six of the seven key childhood skills (locus of control, lower externalising behaviour, application, maths, reading and language comprehension, with social skill again being the exception).

To investigate this route in more detail, and to contribute new findings to the prior evidence base, separate models are run to identify which of the seven key childhood skills predict the different aspects of educational attainment (Table 2.5) thus revealing the specific ways in which childhood skills promote access to elite occupations via educational attainment. This analysis makes a further contribution by using a broader set of educational outcomes, including degree institution, degree class and postgraduate education, which have often previously been omitted in literature assessing SES gaps in access to elite occupations (McKnight, 2015; Sullivan et al., 2018a; Gugshvilli, Bukodi & Goldthorpe, 2017; Gregg, Macmillan and Vittori, 2019).

Table 2.5: Associations between key childhood skills (age 10) and educational attainment (age 16+)

	Age 16+ educational outcomes					
	Num. GCSE (A-C)	Num. Alevel (A-C)	UG degree (v no degree)	Russell Group (v Non Russell)	'Good' degree (v lower class)	Higher degree (v no higher degree)
<i>Childhood skills - age 10</i>						
<i>Non cognitive skills</i>						
Locus of Control	0.25 ***	0.01	0.02 ***	0.00	0.04 **	0.00
Externalising behaviour	-0.29 ***	0.00	-0.01 ***	-0.05 **	0.03	0.00
Application	0.38 ***	0.01	0.01 *	0.02	0.03	0.00
Social skills	-0.09 **	-0.02	0.00	-0.04 ***	0.02	0.00
<i>Cognitive skills</i>						
Reading	0.31 ***	0.00	0.01	0.02	-0.05	0.00
Maths	0.45 ***	0.02	0.01 **	0.02	0.01	0.00
Language comprehension	0.26 ***	0.05 ***	0.00	0.01	0.00	0.00
N	8,700	8317	9219	1363	1355	9498
R. Sq.	0.41	0.45	0.55	0.15	0.05	0.42
<i>Controls:</i>						
Parental occupation	x	x	x	x	x	x
Demographics	x	x	x	x	x	x
Remaining age 10 skills	x	x	x	x	x	x
Career self-management	x	x	x	x	x	x
School type	x	x	x	x	x	x
Num GCSE (AtoC) & eqs		x	x	x	x	x
Num Alevel (AtoC) & eqs			x	x	x	x
UG degree - institution & class						x

*** 99% confidence ** 95% confidence * 90% confidence

Controls are the same as for Model 3, plus also prior attainment where appropriate

The results firstly confirm the long-standing finding that the GCSE performance is highly predicted by age 10 skills (such as Feinstein 2000). Children who rank one standard deviation higher than their peers on each of the six key skills (which excludes social skills) obtain an extra 1.9 GCSEs at grade A to C on average. Related literature tends not to include controls for prior educational attainment when exploring links between childhood skills and educational outcomes (such as Feinstein 2000, Carneiro, Crawford & Goodman, 2007, Goodman et al., 2015), however here they are a useful addition and provide new insights. For example, once GCSE performance is controlled for, childhood skills have very little additional predictive value for A-level grades (except for a small language comprehension effect). Childhood skills are therefore important for A-level performance, but predominantly via their association with prior GCSE performance. Childhood skills, especially non-cognitive ability, do appear to additionally predict obtaining an undergraduate degree even when comparing children with similar GCSE and A-level performance. Here self-perception (locus of control), self-control (application and lower externalising behaviour) and maths ability appear beneficial. Children ranking one standard deviation higher on each of these four measures are 4.3ppts more likely to obtain an undergraduate degree than their otherwise similar peers. As 17.9% of the sample obtain an undergraduate degree, this represents a considerable advantage. In addition, when still comparing children with similar GCSE and A-level performance, self-control (lower externalising behaviour) is a predictor of obtaining a degree from a Russell Group university rather than a Non-Russell Group university and self-perception (locus of control) is a predictor of obtaining a 'good' degree (first or upper second class) rather than a lower classification. These distinctions matter because attendance at a Russell Group university or obtaining a 'good' degree is more predictive of access to elite occupations than attending a non-Russell group university or obtaining a lower-class degree (Table A2.5). Childhood skills are not associated with greater likelihood of obtaining a higher degree once other education credentials are incorporated. It should be noted that these estimates of the marginal effects of childhood skills on higher educational attainment (undergraduate degree, a 'good degree', Russell Group and postgraduate degree) are likely to be underestimates since the comparison group have obtained the same GCSEs and A-level results despite having lower skill levels (the issue of 'bad controls').

These results therefore show that the inclusion of a broader set of educational experiences and attainment can therefore improve our understanding of the relationship between SES, childhood skills and access to elite occupations. The analysis provides new evidence that

children with higher levels of six of the seven key childhood skills (all except social skills) are already on track for higher academic attainment at school and university (including access to Russell Group universities and obtaining a ‘good’ degree), a key requirement for entry to many elite occupations. This is therefore an important route by which higher SES children with higher childhood skills maintain the occupational advantage of their parents, in addition to their more favourable career self-management behaviours. The results also show that social skills are *inversely* related to educational attainment, therefore despite predicting access to elite occupations, it appears social skills do not operate through improved educational performance (nor through career self-management as previously discussed)³⁰.

The decomposition additionally reveals significant effects of educational attainment which are *unrelated* to childhood skills (Model 3). Given the numerous academic credentials often needed to enter elite occupations, it is to be expected that the largest proportion of the SES gap in access to elite occupations is accounted for directly by SES gaps in educational attainment from age 16 onwards (37.0% contribution), particularly obtaining good GCSEs (15.8%) and an undergraduate degree (16.8% in total), especially a first or 2:1 degree. Postgraduate education only makes a small contribution (1.0%) due to the relatively small number of young people obtaining higher degrees (2.2% of the sample). However as more young people obtain undergraduate degrees, postgraduate education may become a greater source of inequality (Wakeling & Laurison, 2017) and this contribution may rise for later cohorts. A further 3.5% of the SES gap in access to elite occupations is explained by SES gaps in access to private education. This contribution remains unexplained by the model as it is unrelated to the measures of childhood skills, career self-management and educational attainment.

2.5.5 Do SES disparities in childhood skills make any remaining direct contribution to explaining SES gaps in access to elite occupations, beyond their association with career self-management and education? (RQ5)

The decomposition has shown that SES gaps in childhood skills account for almost two-fifths (37.2%) of the SES gap in access to elite occupations (Model 1). The results suggest that this effect has several elements.

³⁰ This is in line with figures presented in Blanden, Gregg & Macmillan (2007) and Gregg, Macmillan & Vittori (2019) in which the associations between extraversion and income do not reduce when educational controls are added to the models. It is also in line with Goodman et al, 2015 who find social skills negatively predict degree attainment.

Firstly, approximately half of this effect relates to the indirect association of childhood skills with labour market outcomes via career self-management behaviours and education (the 17.6ppt reduction from 37.2% in Model 1 to 19.7% in Model 3). Therefore, almost one-fifth (17.6%) of the SES gap in access to elite occupations is explained by SES gaps in childhood skills operating through these two indirect channels.

Secondly, a further fifth (19.7%, Model 3) of the SES gap in access to elite occupations is explained directly by childhood skills which remain valuable in the labour market over and above career self-management behaviours and education (and control variables). Specifically, five of the seven key childhood skills directly explain 2.2% (locus of control), 2.1% (application), 1.2% (social skills), 7.9% (maths ability) and 2.9% (language comprehension) of the SES gap in access to elite occupations. Age 10 maths ability is a notable concern as it appears to be a substantial barrier to elite occupations for lower SES children. This is because it remains particularly predictive of access to these careers over and above all other characteristics in Model 3 (every extra standard deviation of maths ability at age 10 is associated with an extra 3.5ppt increase in the chance of accessing an elite job in adulthood, when comparing otherwise similar children). Higher reading ability and lower externalising behaviour do not make any remaining significant contribution to explaining the SES gap in access to elite occupations over and above their indirect influence on educational attainment (particularly at GCSE level). Note that these estimates of the contributions of childhood skills to explaining SES gaps in elite occupations are likely to be underestimates since the comparison group has the same levels of career self-management and educational attainment despite having lower levels of childhood skills (the issue of ‘bad controls’). However, the estimates are descriptive rather than causal meaning that despite this potential bias they still provide suggestive evidence to support policy and employer interventions.

Overall, the full decomposition explains a substantial majority (83.6%) of the SES gap in access to elite occupations (Table 2.3, Model 3). This means that children from elite backgrounds are twice as likely to access elite occupations in adulthood than children from non-elite backgrounds, not only due to SES gaps in non-cognitive and cognitive skills, but also due to SES gaps in a range of career self-management, education and demographic characteristics. Children from more privileged backgrounds therefore accumulate a portfolio of advantages which collectively boost their chances of labour market success.

2.6 Discussion

Contribution to existing literature

The paper makes several contributions to the existing literature in this field. Firstly, the analysis has provided new estimates of the relative contribution of *specific* childhood cognitive or non-cognitive skills to explaining SES gaps in access to elite occupations. This approach extends related research beyond the usual practice of demonstrating the combined mediating effect of groups of attributes on the relationship between social background and labour market outcomes. Identifying the role of specific skills in the transmission of occupational advantage is crucial for social mobility policy design. In doing so, the paper has confirmed the importance of cognitive skills (maths and reading) and non-cognitive skills (locus of control, application and social skills) in enabling access to elite occupations (Stage 2) which has been suggested separately across other papers (McKnight, 2015; Sullivan et al., 2018a; Gugshvilli, Bukodi & Goldthorpe, 2017; Gregg, Macmillan and Vittori, 2019). The paper also considers additional skills which highlight the penalties associated with externalising behaviour (another component of self-regulation) and the benefits of language comprehension when accessing these careers. The results suggest a particularly important role for maths and literacy in the transmission of occupational advantage, followed by self-control and regulation, self-perception and a smaller role for social skills. The finding that having high levels self-esteem is not a significant predictor of better occupational outcomes is in line with previous research (Green et al., 2018; McKnight; 2015).

Secondly, this paper provides new evidence on the potential routes by which the seven key childhood skills may promote greater access to elite occupations. It shows that six of these skills predict early signs of career self-management behaviour during teenage years and later educational attainment, which both in turn predict access to elite occupations in adulthood. This extends related research in four ways. It demonstrates that career self-management (especially professional aspirations, commercial awareness and challenge seeking) is a second route by which higher SES children with higher skills obtain an advantage in the labour market (over and above educational attainment). It extends research on the links between childhood skills and aspirations (such as Moulton et al., 2018; Schoon & Polek, 2011) to include more aspects of teenage career self-management behaviour. It also provides empirical support for theories in graduate recruitment literature on the importance of career self-management for labour market success (e.g. Holmes, 2013; Okay-Somerville & Scholarios 2017). By including a broader set of

educational experiences and attainment the results also improve our understanding of the relationships between SES, childhood skills and access to elite occupations by revealing the specific ways in which childhood skills promote access to elite occupations via educational attainment.

Thirdly, from a methodological perspective, this paper highlights the benefit of analysing occupational outcomes over multiple waves of data rather than one snapshot mid-career which is common in related literature (McKnight, 2015; Sullivan et al., 2018a; Gugshvilli, Bukodi & Goldthorpe, 2017) but which conflates issues of access, retention and progression in elite careers. The results show that this standard approach underestimates the proportion of individuals accessing elite careers by almost a half and can underestimate the importance of childhood skills for access to these careers (especially at age 42).

Implications for policy makers and employers

While the analysis undertaken in this paper is descriptive rather than causal, the findings provide indicative evidence for policy and practice. From a policy perspective, the research supports interventions to close the SES gap particularly in children's cognitive ability in maths and literacy (reading and language comprehension), closely followed by self-control (application and reduced externalising behaviour) and self-perception (locus of control). The descriptive results suggest these interventions could contribute to levelling the playing field of access to elite occupations through two routes: promoting career self-management behaviours (particularly professional aspirations, commercial awareness and challenge-seeking values) and improving educational attainment. Evidence on the benefits of improving children's social skills suggests they are not strong predictors of teenage career management behaviours or later educational attainment, however they do appear to be associated with access to elite occupations through other means.

From an employer perspective, cognitive and non-cognitive skills of applicants are observed through the selection tools used in the recruitment process. In this scenario, applicants with higher levels of childhood skills may also perform well in recruitment tests. Recruiters must therefore be alert to the possibility that screening methods which assess cognitive and non-cognitive skills may also inadvertently be assessing the social background of applicants and favouring those from more advantaged families. This suggests that widening the scope of contextual recruitment practices to include all

recruitment criteria and tests (not only academic performance which is often the focus) may have benefits for social mobility. Further research is also required into how childhood skills are developed into the higher order skills sought by employers such as teamwork, critical thinking and problem solving (Deming, 2022).

Employers and researchers should also be aware that almost a fifth (16.5%) of the SES gap in access to elite occupations remains unexplained by this analysis. It is likely that this remaining unexplained effect of having an elite parent on access to elite occupations is underestimated in the analysis as the comparison group has the same level of childhood skills, career self-management and educational attainment as children from elite backgrounds despite being from non-elite backgrounds, so they are an over-performing group (this issue of ‘bad controls’ also potentially downward biases the contributions of skills in the decomposition). This unexplained advantage requires further exploration to identify additional attributes which vary by social background and are favoured by elite employers. This may include other non-cognitive attributes which are considered a reflection of ‘talent’, such as persuasiveness, confidence, drive and ‘polish’ (Ashley et al., 2015; Sutton Trust, 2014; Exley, 2019) or other cognitive skills which are often directly assessed by employers (such as situational judgement or critical thinking). Later measures of career self-management (such as the use of networks and work experience) closer to labour market entry would also be informative due to the widely acknowledged importance of internships and ‘playing the game’ during university years (Bathmaker, Ingram & Waller, 2013; Roberts, 2017; Total Jobs & SMF, 2021; Wright & Mulvey, 2021) for access to elite occupations. Additional measures of cultural capital (such as accents, hobbies or style of dress) and human capital (such as subject of study or detailed grades) are also likely to contribute to SES gaps in access to elite occupations³¹. It therefore remains unclear whether the unidentified SES barriers reflect discrimination based on social background or whether they capture omitted meritocratic factors. It is often thought employers misrecognise social and cultural traits as signs of merit or talent and assume markers of privilege are indicators of quality (Friedman, Laurison & Macmillan, 2017; Ashley et al., 2015; Exley, 2019). However, as stated in Hallsten (2013) ‘it is intrinsically hard to test whether economic returns on class-specific personality, like other types of discrimination, are due to productivity or favouritism’.

³¹ For cultural capital see Ashley & Empson (2017), Rivera (2012), Cook, Faulconbridge & Muzio (2012), Duff (2017); Friedman, Laurison & Miles (2015), Sutton Trust (2022). For subject of study see Sullivan et al (2018b), Dilnot, 2016; Dilnot, 2018.

Limitations of the research

The analysis in this paper is subject to some limitations. Firstly, the analysis is unable to accurately distinguish between individuals who did not apply to an elite occupation due to aspiring to another career path, and those who applied but were unsuccessful due to failing to meet the employers' criteria. This is important as it would confirm whether the source of the unequal access to elite careers is largely SES disparities in aspirations or SES barriers faced by applicants during the recruitment process. The measures of aspiration at age 16 in the analysis give some indication that early SES gaps in professional aspirations and challenge-seeking values contribute to the persistence of elite occupations between generations, but they are unlikely to be an accurate measure of who applies for an elite occupation up to age 42. Data capturing whether an individual has ever applied for an elite occupation and whether they received a job offer would be required to fully untangle the role of individual aspirations and potential recruiter bias in this dataset.

Secondly, these results may only be partly generalisable to young people entering the labour market today, approximately 30 years after the BCS70 cohort. The BCS70 dataset is highly suited to the analysis of labour market outcomes for people mid-career as it contains rich background characteristics and captures barriers to elite occupations throughout the life cycle which is especially relevant for managerial careers where access often occurs later in life, and for women who are more likely to have periods out of the labour market mid-career. However, as the survey observes people over a substantial period of their lives, the analysis is naturally restricted to people born a relatively long time ago who faced different education and labour market conditions early in their careers. There is therefore some uncertainty around whether the same SES gaps in access to elite occupations remain for younger cohorts and whether the same characteristics explain these gaps. On the first point, SES gaps in access to elite careers *are* observed for more recent cohorts of young people in early stages of their careers (in 2000s: Britton et al., 2019 and in 2010: Macmillan, Tyler & Vignoles, 2015) meaning the issue is still as relevant as ever, however it remains to be seen whether these labour market barriers persist for today's new labour market entrants when they are mid-career in 20 years' time and progressing into managerial roles. The issue is also likely to continue to be a concern in coming years as increases in the UK birth rate (from 2002-2012) begin to feed through into the graduate labour market potentially increasing competition for university places

and graduate jobs³² (ONS, 2023). On the second point, it is possible that the ongoing growth in the number of graduates, coupled with an ever-increasing emphasis on graduate employability to remain competitive, may have increased the importance of non-academic attributes relative to academic attainment in younger cohorts in explaining SES gaps in access to elite occupations (Ashley et al., 2015). This trend is compounded by the reduction in the proportion of graduate employers requiring specific academic credentials³³ (ISE, 2022) as they shift to other methods of identifying the best talent for their entry-level programmes, such as situational judgement or critical thinking tests and work experience schemes³⁴. It is therefore likely that the contributions of non-cognitive skills, aspirations, networks, work experience and commercial awareness to explaining SES gaps in access to elite professions are lower bound estimates for the current generation of graduates.

2.7 Conclusion

This paper has shown that children from elite families are twice as likely to access an elite occupation in adulthood than their less advantaged peers. Almost two-fifths (37.2%) of this socio-economic gap in access to elite occupations can be explained by socio-economic gaps in cognitive and non-cognitive skills which are already present by age 10. Particular importance is attached to the role of cognitive ability in maths and literacy (reading and language comprehension), followed by self-control (application and reduced externalising behaviour) and self-perception (locus of control) with a smaller role for social skills.

The results have shown that the 37.2% contribution of childhood skills to explaining SES gaps in access to elite occupations consists of several elements. Firstly, childhood skills are indirectly associated with access to elite occupations via their relationship with career self-management and education (17.6% contribution). Childhood skills particularly predict professional aspirations, challenge-seeking values, commercial awareness and

³² The UK birth rate rose gradually from 2002 (668,777) to a peak in 2012 (812,970) – the highest since the baby boomers of the 1960s. This will potentially increase competition for university access (if university places are not expanded to accommodate this) and/or may increase competition in the graduate labour market (if university places are expanded). Either way, it raises concerns that young people from lower SES backgrounds will lose out and be less likely to access elite occupations.

³³ In the last ten years the proportion of graduate employers requiring a 2:1 degree has reduced from three quarters (76%) to a half (49%), and the proportion requiring A-levels has reduced from 40% to 13%. Also, more than a third of employers reported plans to shift to qualification blind recruitment.

³⁴ Two-fifths of companies surveyed warned that graduates without work experience were ‘not very likely’ or ‘not at all likely’ to be recruited, regardless of their academic achievements (High Fliers, 2020).

educational attainment at GCSE and undergraduate level (including access to Russell Group universities and obtaining a ‘good’ degree). Higher SES children with higher levels of cognitive and non-cognitive ability at age 10 are therefore more likely to demonstrate early signs of career self-management behaviour at age 16 and attain better educational outcomes at age 16 and beyond, making them better placed to enter an elite occupation in adulthood. Secondly, childhood skills are directly associated with access to elite occupations over and above their relationship with career self-management and education (19.7% contribution).

These findings support policies to reduce SES disparities in childhood skills to encourage greater access to elite occupations for children from less advantaged backgrounds. Elite employers should also capture and analyse social background data for applicants and recruits to ensure that recruitment tests which assess cognitive or non-cognitive skills do not create barriers to employment for less advantaged students.

Chapter 3**The ‘Elite Male Advantage’ in Access to Elite Occupations****Claire Tyler****Abstract**

This paper provides new evidence on the intersecting influence of socio-economic status (SES) and gender on access to elite occupations. It reveals a large ‘triple advantage’ for sons from elite backgrounds over daughters from non-elite backgrounds, reflecting not only advantages related to SES and gender in isolation, but also an additional advantage experienced only by elite sons. The intersection effect accounts for almost a quarter (23%) of the raw access gap in elite occupations overall and 40% in science, technology, engineering and maths (STEM) professions. When exploring which characteristics explain this advantage, it is clear that elite sons accumulate a portfolio of educational and non-educational advantages which drive their success relative to non-elite daughters, but there are additional advantages relating to the intersection of SES and gender in professional aspirations, private schooling, attainment at GCSE, obtaining a STEM undergraduate degree and having a postgraduate degree. However, observable characteristics explain only 45% of the gap between elite sons and non-elite daughters in access to elite occupations over the first half of their career (age 26-42) and a third of the gap in access to STEM occupations over the same period, suggesting that a substantial proportion of the advantage of elite sons remains unexplained by the rich characteristics available in the data. The findings support calls for employers to collect data on the socio-economic background of their applicants, alongside other diversity characteristics, to monitor access gaps between individuals with multiple advantages or disadvantages, identify the causes of these gaps and take action to reduce the barriers faced by groups identified by the intersection between such characteristics.

3.1 Introduction

Access to ‘elite’ occupations (higher managerial and professional careers) in the UK is significantly associated with social background and gender (e.g. McKnight, 2015; Sullivan et al., 2018a&b; Macmillan, Tyler & Vignoles, 2015; Adamecz-Völgyi & Shure, 2022). These occupations offer better long-term earnings prospects, more autonomy and greater economic security and stability than other occupations (Goldthorpe & McKnight, 2006) and are crucial to the UK economy, representing almost a third of all jobs (UKCES, 2016). They also include positions of power and influence in society including senior roles in politics, law, business and media (The Sutton Trust, 2019). As such, understanding and reducing diversity barriers to elite occupations promotes equality of opportunity for all.

Interventions to improve access to elite occupations based on single diversity characteristics, such as gender or socio-economic status (SES), are common practice in policy and industry. However, despite the known importance of these characteristics in accessing elite occupations, the overlapping effect of SES and gender in these careers is currently under-researched. Related social mobility studies show that social background barriers to elite labour market outcomes are larger for sons than for daughters, which points to an intersection of SES and gender but they do not explore why this might be the case (Goldthorpe and Jackson, 2007; Bukodi, 2009; Britton et al., 2019; Marcenaro-Gutierrez, Micklewright & Vignoles, 2014; Crawford et al., 2016). Other studies demonstrate a ‘double advantage’ for sons from elite backgrounds and a corresponding ‘double disadvantage’ for daughters from non-elite backgrounds when accessing elite occupations but do not explore how SES and gender characteristics may interact to generate wider gaps in access than expected (McKnight, 2015; Sullivan et al., 2018a and 2018b). The overlapping effect of SES and gender has also been considered in research on educational outcomes (Codioli-Mcmaster & Cook, 2019; Strand 2014 & 2021, SMC 2016b) and on pay progression *within* elite occupations (Friedman & Laurison, 2020; Friedman, Laurison & Macmillan, 2017) but has not yet been explored at the intervening stage of *access* to these careers.

This paper therefore contributes to this existing literature on access to elite occupations in several ways. Firstly, it provides new evidence that socio-economic status (SES) and gender intersect to provide a large ‘triple advantage’ for sons from elite backgrounds compared to daughters from non-elite backgrounds when ‘*ever*’ *accessing* elite occupations. This extends previous studies by measuring access to these careers over the

first half of an individual's career (age 26-42). This approach has been shown to capture access more accurately than single point-in-time measures which are common in related literature as it avoids conflating issues of access and retention (see Chapter 2). The results show that elite sons are 2.5 times more likely to ever access an elite career than non-elite daughters (57.0% vs 22.5%) and that over half of this raw advantage is explained by SES (57%), a fifth by gender (20%) and a quarter (23%) by the interaction of SES and gender. This means that sons from elite backgrounds perform significantly better, and daughters from non-elite backgrounds perform significantly worse, than we would expect given the SES and gender barriers faced by their peers.

Secondly, the paper addresses the puzzle of why elite sons have the highest access rates to elite occupations despite not having the highest levels of educational attainment at school and undergraduate degree level. This identifies a wide range of childhood skills, career self-management and educational attributes which favour sons from elite backgrounds. In particular, the analysis reveals five characteristics where SES and gender interact to provide even greater benefits for elite sons in the labour market. These attributes are professional aspirations, private schooling, attainment at GCSE, obtaining science, technology, engineering and maths (STEM) undergraduate degrees and having a postgraduate degree. Sons from elite backgrounds have higher endowments of these five valuable attributes than we would expect given the SES and gender disparities in attributes observed in their peers, which contribute to explaining why they are more likely to access elite occupations than daughters from non-elite backgrounds.

Nevertheless, even accounting for a range of attributes and these interactions, 55% of the elite male advantage over non-elite daughters in access to elite occupations remains unexplained. Illustrative analysis suggests heavily gendered labour market choices around part time work and caring responsibilities could potentially explain some, but not all, of the remaining unexplained access gap, but these effects are largely driven by differences in these choices between men and women, rather than by SES, and thus are not part of the 'third advantage' of elite sons over non-elite daughters which captures the interaction of gender and SES.

Thirdly, by analysing outcomes by occupational type, the results are able to quantify the differential advantage of elite sons over non-elite daughters in managerial careers, STEM, business & law, and other public service professions. The 'triple advantage' of elite sons is driven by SES barriers in all elite occupational groups considered; additional gender gaps in managerial careers and STEM professions; and a large third advantage for elite

sons (and disadvantage for non-elite daughters) in accessing STEM professions due to the interaction of their SES and gender characteristics. Access gaps are therefore most pronounced in STEM careers where elite sons are nine times more likely to access these careers than non-elite daughters (17.9% vs 2.0%). The interaction of SES and gender in explaining these raw differences is particularly large, accounting for 40% of the 15.9ppt access gap. It is also concerning that, even after controlling for a range of educational and non-educational characteristics, two-thirds of the 15.9ppt advantage of elite sons over non-elite daughters in STEM professions remains unexplained.

The findings have several implications for policy and practice. As the results show that SES gaps are larger than gender gaps in access to all elite occupation types considered, employers should collect socio-economic background data from their applicants (in line with current UK government guidance e.g. SMC (2021a)), alongside other diversity characteristics, to monitor access gaps, including those between individuals with multiple advantages or disadvantages. The findings also support calls for SES to become a protected characteristic³⁵ in UK law alongside gender since females from non-elite backgrounds in this study do not simply face an 8.3ppt gender gap in access to elite occupations (sample mean), they face a 34.5ppt gap (22.5% vs 57.0%) compared to elite males, meaning the majority of their disadvantage is unprotected.

The findings further support interventions at school-level to close the gap between higher SES sons and lower SES daughters in childhood cognitive skills (especially SES and gender gaps in maths), career self-management (especially SES and gender gaps in graduate job aspirations) and educational attainment (especially SES gaps in GCSE grades). This reflects the fact that disparities in GCSE attainment, maths ability and aspirations account for one-fifth of the access gap in elite occupations. Employers also have an important role to play in ensuring that their recruitment processes take into account the fact that certain groups may be particularly disadvantaged through the intersection of characteristics that are associated with lower access to elite occupations, such as the triple disadvantage faced by women from non-elite backgrounds. In addition, increasing opportunities for job shares or part-time roles, and encouraging the take-up of these roles, as well as existing policies such as shared parental leave amongst men, which illustrative analysis shows together may account for around a third of the access gap,

³⁵ The Equality Act (2010) provides protection against discrimination on the basis of nine characteristics (age, gender, race, disability, religion or belief, sexual orientation, gender reassignment, marriage or civil partnership and pregnancy and maternity). There are calls for social background to be added to this list (e.g. SMC 2021b).

would also likely benefit access to elite occupations amongst women, the majority of whom come from non-elite backgrounds.

The remainder of this paper proceeds with an overview of related literature and research questions (Section 2), followed by a discussion of the BCS70 data (Section 3) and methodology used (Section 4). Results follow in Section 5 with a discussion of the implications for social mobility research, policy makers and employers and some key conclusions in Section 6.

3.2 Related literature

3.2.1 Social background and gender in elite occupations

It is well known that access to elite occupations is associated with social background (e.g. Macmillan, Tyler & Vignoles, 2015; Macmillan, 2009; Bukodi & Goldthorpe, 2011a & b; Gugushvilli, Bukodi & Goldthorpe, 2017; McKnight, 2015; Sullivan et al., 2018a&b) and gender (Adamecz-Völgyi & Shure, 2022; Friedman, 2022; ONS, 2021; Rivera & Tilcsik, 2016; Riach & Rich, 2006; Coltrane, 2004; Bertrand and Hallock, 2001). However, there is currently a lack of quantitative evidence on the joint influence of SES and gender on labour market outcomes. This concept of intersectionality (Crenshaw, 1989) is gaining greater prominence in diversity and inclusion policy debates, but there is currently very little clear evidence on which to base policy actions. For example, Woodhams, Lupton & Cowling (2015) identify the impact of multiple disadvantages (gender, ethnicity, disability and age) on pay but do not address social background as it is not currently a protected characteristic. However, there are good reasons to believe that social background and gender interact to materially influence labour market outcomes. Specifically, in social mobility literature using single point-in-time outcome measures, several authors split their analysis by gender to reveal that the labour market advantage of originating from a higher SES background is greater for sons than for daughters (Goldthorpe and Jackson, 2007; Bukodi, 2009; Britton et al., 2019; Marcenaro-Gutierrez, Micklewright & Vignoles, 2014; Crawford et al., 2016). These papers therefore point to a triple advantage for elite sons (SES, gender and intersecting effect) but they do not explore why this might be the case.

Widening the analysis to include both SES and gender barriers (not just SES barriers split by gender), McKnight (2015) explicitly quantifies the difference in the proportion of elite sons and non-elite daughters accessing elite occupations but does not estimate the interaction effect. This reflects the traditional approach of treating labour market diversity

barriers as additive by showing a ‘double advantage’ for males from higher SES backgrounds but hiding any additional advantage which may occur due to the interaction of their SES and gender characteristics. This additive approach is also taken by Sullivan et al. (2018a and 2018b) in their studies of social background, education and access to elite occupations.

In related research which explores SES and gender gaps in terms of educational outcomes (SMC, 2016b; Strand 2014 & 2021) and in terms of barriers to pay progression *within* elite occupations (Friedman & Laurison, 2020; Friedman, Laurison & Macmillan, 2017), the interaction effect is considered. For example, the earnings premium of £18,900 (60%) for men from professional and managerial backgrounds over women from working-class backgrounds is shown to be larger than the gender (£10,000) and class (£6,400) gaps combined, showing that within elite occupations pay penalties can interact to be ‘not just additive but also multiplicative’ (Friedman & Laurison, 2020, pg51). There is also acknowledgment of the likely existence of a ‘third advantage’ for high SES men relative to low SES women in wider labour market outcomes (APPG, 2019; The Royal Society, 2014; Bridge Group, 2019 & 2020a), but these differences are not explored quantitatively.

This paper therefore contributes to the academic and policy literature by establishing that the interaction of social background and gender characteristics, which affects pay *within* elite occupations, also affects *access to* elite occupations earlier in the recruitment pipeline. It also broadens the period over which outcomes are observed to cover the first half of an individual’s career (age 26-42) rather than single point-in-time measures which underestimate access to elite occupations (Chapter 2). The analysis also follows related social mobility literature which increasingly splits findings by occupational type or industry (Laurison and Friedman 2016; Macmillan, Tyler & Vignoles, 2015; Friedman, Laurison & Macmillan, 2017; Adamecz-Völgyi & Shure 2022) to show in which elite occupations the interacting effect of social background and gender is the most concerning. This particularly relates to ongoing policy concerns around diversity in managerial careers (Hampton-Alexander, 2017; Davies 2015), STEM professions (The Royal Society, 2014; SMC 2016a, APPG 2020, Bridge Group 2020a & 2022; UK Parliament 2022; Bukodi, Goldthorpe & Steinberg, 2022) and business and law professions (SMC, 2016a & 2020; Bridge Group, 2019; Ashley, 2022a).

3.2.2 *What explains the success of higher SES males compared to lower SES daughters?*

Demonstrating excellent academic achievement is particularly crucial for aspiring managers and professionals who are recruited in the ‘war for talent’, through competitive multi-stage recruitment processes with high academic requirements (Duff, 2017; Sullivan et al., 2018a; Brown & Hesketh, 2004; Daly, Egan & O’Reilly 2015). If sons from elite backgrounds obtain the highest educational outcomes, this could substantially explain their high levels of access to elite occupations. However, this is not the case. Although higher SES children achieve better educational outcomes than lower SES children (Bukodi & Goldthorpe, 2011a; Blanden, Gregg & Macmillan, 2007; Macmillan, Tyler & Vignoles, 2015; Gugushvilli, Bukodi & Goldthorpe, 2017; Sullivan et al. 2018a & b; Britton et al., 2019), it is girls who usually out-perform boys at GCSE and A-level and are more likely to go to university and achieve higher degree classifications (SMC, 2016b; Strand, 2014 & 2021; Crawford and Greaves, 2015).

Following the recent trend of analysing the impact of intersectionality on educational outcomes (Codioli-Mcmaster & Cook, 2019), several of these studies confirm that daughters from elite backgrounds tend to perform the best at school, and sons from lower SES backgrounds perform the worst (Strand 2014 & 2021, SMC 2016b). Therefore, educational attainment alone cannot explain why sons from elite backgrounds have the highest rates of access to elite occupations, and why daughters from non-elite backgrounds have the lowest. This is confirmed in McKnight (2015) and Sullivan et al. (2018a³⁶ and 2018b) where separate SES and gender gaps in access to elite occupations remain significant even after the inclusion of detailed skills and educational controls. This is also supported by Marcenaro-Gutierrez, Micklewright & Vignoles (2014), who report larger SES gaps in occupational outcomes for sons than daughters even after controls (maths and years of education) and suggest further exploration of the ‘differences in the way that parental Socio-Economic Group (SEG) impacts on men and women’s eventual labour market success’ (pp. 209).

This paper therefore contributes to this prior literature by looking beyond cognitive skills, school type and educational attainment (as considered by McKnight (2015) and Sullivan (2018a & 2018b)) to also consider a range of other attributes which may explain why the intersection of social background and gender favours high SES males in the elite labour

³⁶ With the exception of Sullivan et al (2018a) where the model explains the SES gap in access to elite occupations, but the gender gap remains.

market. These include a range non-cognitive skills in childhood³⁷; career self-management behaviours (such as aspirations, use of networks and work experience); additional higher education attainment metrics such as degree class and obtaining a postgraduate degree; and labour market choices around part-time work and parental leave. These attributes are known to vary by SES (see Chapter 2) and/or gender (Nikolau, 2012; Sullivan, 2009; Duckworth & Seligman 2006; Marcenaro-Gutierrez, Micklewright, Vignoles 2015; Moulton et al., 2018; Francis et al., 2005; Reeves et al., 2017; Wright & Mulvey; 2021; Wakeling & Laurison; 2017; Donnelly & Gamsu, 2019; Hakim, 2006; Walsh, 2012). However, whether these attributes are more beneficial to higher SES sons and more detrimental to lower SES daughters in the elite labour market than the sum of the separate SES and gender gaps suggests, remains unexplored.

3.2.3 Diversity in policy and practice

Despite the increasing recognition of the importance of intersections between characteristics in academic literature, approaches to diversity in policy and practice have been slow to adapt. Fair access to elite occupations is a key strand of government policy with ongoing interventions across a range of diversity barriers, including social background (Cabinet Office, 2012; SMC, 2021a), gender (Hampton-Alexander, 2017; Davies 2015, Government Equalities Office, 2016; APPG, 2019) and ethnicity (McGregor-Smith 2017; BEIS 2019; Parker 2022). A diverse workforce is also sought by employers due to the increasingly well-documented business case related to profitability, innovation and better decision making (McKinsey 2014, 2018, 2020; BCG, 2017; Nathan & Lee, 2013; Herring, 2009; Galinsky et al., 2015) and by employees who aspire to work for companies with a strong commitment to diversity (Bright Network, 2021). The majority of the UK's top graduate employers therefore rank achieving their social mobility, gender and ethnicity targets to be a 'very high' priority (High Fliers, 2020).

However, in both policy and practice, as in much of the academic literature, each type of diversity is often considered in isolation. This approach originates from UK legislation (The Equality Act 2010) which protects individuals from discrimination on the basis of nine single characteristics, each of which must be argued separately (Woodhams, Lupton & Cowling, 2015), and does not include socio-economic background. This paper argues that this traditional approach to analysing diversity characteristics in isolation risks

³⁷ McKnight (2015) does control for locus of control, self-esteem and externalizing behaviour, however this paper extends this to incorporate a wider range of childhood non-cognitive skills including academic self-concept, application, social skill and emotionality.

underestimating not only barriers for individuals with multiple disadvantages, but also opportunities for individuals with multiple advantages, thus obscuring the true access gap between the most and least advantaged groups.

3.2.4 Research questions

Building on the prior literature discussed, this research addresses the two following questions:

RQ1: Do sons from elite backgrounds experience a ‘triple advantage’ rather than a ‘double advantage’ over daughters from non-elite backgrounds when accessing elite occupations?

RQ2: Can disparities in childhood skills, career self-management and educational experiences account for this ‘elite male advantage’ in access to elite occupations?

Answers to both research questions are considered overall and across different occupational groups.

3.3 Data

3.3.1 Sample

This analysis uses data from the British Cohort Study (BCS), a longitudinal survey of children born in Great Britain in one week in April 1970. The sample comprises 11154 individuals for whom occupational status data for both themselves and their parents is available and includes sons from elite backgrounds (n=999, 9.0% of sample), daughters from elite backgrounds (N=969, 8.7% of sample), sons from non-elite backgrounds (N=4673, 41.9% of sample) and daughters from non-elite backgrounds (N=4513, 40.5% of sample).

3.3.2 Occupational status

The occupational status of cohort members is measured over five survey waves from age 26 to 42, with elite occupations comprising employers and managers in large establishments plus self-employed and employed professionals (equating to NS-SEC Class 1 out of 8 - higher managerial, administrative and professional occupations)³⁸. Non-

³⁸ This is the same approach as Paper 2 in which four Socio-Economic Groups (SEG) are combined to approximate to NS-SEC 1.

elite occupations are defined as all other jobs including being ‘unemployed-looking for work’ to capture all cohort members who are available to access elite or non-elite careers.

Combining occupational data from these five survey waves into a single measure of ‘ever accessing an elite occupation from age 26 to 42’ allows access to elite occupations to be captured more comprehensively than using a single wave and accounts for the substantial movement observed between elite and non-elite occupations (see discussion in Chapter 2). Using age 42 data only, as is common in related literature (such as McKnight (2015); Marcenaro-Gutierrez, Micklewright & Vignoles (2014); Sullivan et al. (2018a and 2018b)) would underestimate the number of women ever accessing elite jobs by half (13.8% of women are employed in these jobs at age 42 versus 25.9% ever) and would underestimate the number of men accessing elite jobs by a third (21.9% at age 42 versus 34.3% ever) (Appendix A3.1).

Analysing data over the first half of individuals’ careers therefore gives a more accurate picture of access to elite occupations, especially for women who are more likely to downgrade their occupation mid-career (Connolly & Gregory, 2008) or to spend time out of the labour market mid-career³⁹ (although any temporary access to elite careers in between waves remains unobserved). Using multiple waves of data therefore avoids the limitation of single mid-career snapshot measures which conflate issues of access, retention and progression.

Analysing elite careers by occupational type can provide further insights into industry-specific diversity barriers. Elite occupations are therefore split into managerial and professional roles, with professions further split into science, technology, engineering and maths (STEM), business and law, and other public service careers (see Appendix A3.2 for more detail). Overall, 22.5% of cohort members ever access a managerial career and 11.0% ever access a professional career (6.1% STEM ever; 3.7% business & law ever; 1.5% other public service ever) and 2.2% access both at different times during the first half of their career.

A cohort member is defined as being from an ‘elite background’ if either their mother or father reports being employed in an elite occupation (using the same definition as for their

³⁹ For example, 2141 cohort members in the BCS70 population ever (i.e. at least once) have full-time home or caring responsibilities (and for whom parental occupational data available) and most of these are women (2040 women, 101 men). Using multiple waves of data means that 80.1% (1716/2141) of individuals with these responsibilities can be included in the sample due to providing occupational data in another wave. The remaining 425 people with these responsibilities (2.3% of the 18740 BCS70 population) remain excluded from the sample due to never providing occupational data.

children) when the cohort member is aged 10 or 16. Within the sample, 17.6% of sons and 17.7% of daughters fall into this category.

3.3.3 Explanatory characteristics

This paper explores to what extent differences in access to elite occupations by gender and socio-economic background can be explained by a range of characteristics – in particular, to what extent different factors explain the difference in outcomes between sons from elite backgrounds and daughters from non-elite backgrounds. The characteristics considered cover both known entry criteria for elite occupations (such as educational attainment), and other non-educational characteristics which are commonly discussed as creating socio-economic barriers (such as career aspirations, networks and work experience) or gender barriers to these careers (part time working or having full time home or caring responsibilities).

The starting point is the same set of characteristics used in Chapter 2. Non-cognitive skills (at age 10) are represented by locus of control, self-esteem, academic self-concept, externalising behaviour, application, social skills and emotionality; and cognitive skills (at age 10) are represented by ability in reading, maths, language comprehension, spelling and IQ (British Ability Scale). Career self-management attributes are captured at age 16 and comprise measures of career aspirations (high wage, promotion, challenge, long term security, professional career); use of educational and personal networks for education and career advice (no networks, educational only, personal only, or both) and work experience (arranged by school and commercial awareness). Educational experiences (age 16 onwards) include the type of school attended at age 16 (private, grammar or non-selective state) and educational attainment from age 16 onwards (GCSE, A-level). Undergraduate qualifications are measured by a categorical variable reflecting the interaction of obtaining an undergraduate degree (or not), degree institution (Russell Group or non-Russell Group) and degree class (2:1 or above, 2:2 or below), versus the base category of not obtaining an undergraduate degree.

Due to the additional focus on accessing specific elite industries (STEM, Business & Law, and other public service), choice of degree subject is also considered within educational experiences. Four degree subject groupings are used in line with related research (Walker & Zhu, 2011, Sullivan et al., 2018b; Henderson, Shure, Adamecz-Völgyi, 2020). These are STEM (Science, Technology, Engineering and Mathematics); LEM (Law, Economics and Management), OSSAH (other social sciences, arts and

humanities), and Combined (degrees which combine more than one subject). Postgraduate qualifications are captured by a binary variable reflecting whether (or not) the cohort member obtained a higher degree (masters or PhD).

The impact of labour market choices during adulthood (age 26-42) is also considered illustratively. These choices are captured by two binary variables reflecting 'ever working part time' and 'ever having full-time home or caring responsibilities'. This paper extends Chapter 2 to incorporate the role of gender and its interaction with social background, however gender gaps in access to elite occupations appear to remain largely unexplained by the skills and education attainment variables commonly used in social mobility literature (McKnight, 2015; Sullivan et al. 2018a and 2018b). Labour market choices may therefore provide more insight into why elite sons perform so well compared to non-elite daughters as they vary markedly by gender and have been shown to influence occupational outcomes (Hakim, 2016; Connolly & Gregory 2008; Walsh, 2012). However, it is challenging to untangle the extent to which preferences for flexible work predict occupational choices and/or whether occupational choices constrain flexible work options as they are captured over the same time period. The potential roles of part-time work and periods out of the labour market in explaining differential access to elite occupations are therefore only considered illustratively with appropriate caveats provided.

Mean values of all childhood characteristics are included in Appendix A3.3 for each of the four key groups of cohort members (split by gender and SES), namely sons from elite and non-elite backgrounds, and daughters from elite and non-elite backgrounds. Appendix A3.4 further shows the mean values of all childhood characteristics by SES only and by gender only for context. The scores for non-cognitive skills, cognitive skills and commercial awareness have been standardised across the BCS70 population (N=18740) to a mean of zero and standard deviation of one.

Sons and daughters from elite and non-elite backgrounds may also differ in other ways which are not captured by these groups of characteristics, but which may influence their chances of accessing elite jobs. The findings therefore represent associations rather than causal relationships. Following the same approach as Chapter 2, controls have therefore been included for ethnicity, region of origin (UK regions or international), parental age and the number of survey waves in which individuals were captured (from one to five), to mitigate some of this possibility. Dummy variables have also been included to reflect missing data in explanatory variables. Missing data for explanatory characteristics is

imputed as the mean value of characteristics for children with the same parental occupational status and gender.

3.4 Methodology

RQ1: Do sons from elite backgrounds experience a ‘triple advantage’ rather than a ‘double advantage’ over daughters from non-elite backgrounds when accessing elite occupations?

The paper firstly sets out SES and gender gaps in access ‘ever’ to elite occupations followed by access rates for each SES x gender group. This shows that elite sons have the highest rates of access to elite occupations and non-elite daughters have the lowest. These figures are also shown by elite occupational type – managerial careers and STEM, business and law, and other public service professions.

The analysis then assesses whether elite sons benefit from a ‘triple advantage’ over non-elite daughters when accessing elite careers rather than only a ‘double advantage’. The total gap in access rates to elite occupations between elite sons and non-elite daughters is estimated from a model including SES, gender and a SES x gender interaction (Equation 1, total gap given by $\pi_1 + \lambda_1 + \delta_1$) (as per Friedman, Laurison and Macmillan, 2017). A significant and positive interaction term indicates elite males benefit from a triple advantage over non-elite daughters when accessing elite occupations.

$$elite^{child} = \alpha_1 + \pi_1 SES + \lambda_1 gender + \delta_1 SES * gender \quad (\text{Equation 1})$$

In all models, SES captures either elite (=1) or non-elite (=0) parental occupational status, and gender captures sons (=1) and daughters (=0). The base category in the interacted model (Equation 1) is therefore non-elite daughters which is purposefully chosen as a large group (82% of daughters and 40.5% of the sample) to clearly show that the interaction of SES and gender is not a niche issue; rather it is a significant concern for a large proportion of the population. In all models the outcome variable is binary to represent ever accessing (=1) or never accessing (=0) an elite career, or a subset of these elite careers. As such, all models are run with probit specifications to estimate the marginal effects (in percentage point terms) of SES and gender characteristics on access to elite careers.

RQ2: Can disparities in childhood skills, career self-management and educational experiences choices account for this ‘elite male advantage’ in access to elite occupations?

The paper secondly explores to what extent differences in characteristics may explain the advantage of elite sons over non-elite daughters, and which characteristics seem particularly important in explaining the difference in access to elite occupations. For this analysis, cohort members are assigned into one of four categories (elite sons (ES), elite daughters (ED), non-elite sons (NES), and non-elite daughters (NED) as the base category) to explore the full extent of the advantage faced by sons from elite backgrounds and the disadvantage faced by daughters from non-elite backgrounds. The elite male advantage over non-elite daughters is therefore shown as a single coefficient (ES) in Models 0-3 (Equations 2-5) for ease of discussion rather than being split over three coefficients in an interacted model. In Model 0 (Equation 2), the coefficient on the elite son term (β_1) is equal to the total gap between elite sons and non-elite daughters given by $(\pi_1 + \lambda_1 + \delta_1)$ in Equation 1. The coefficient on the elite daughter term (π_1) remains equal to the gap between elite daughters and non-elite daughters given by the coefficient on the SES term in Equation 1. The coefficient on the non-elite son term (λ_1) remains equal to the gap between non-elite sons and non-elite daughters given by the coefficient on the gender term in Equation 1.

Models are then built sequentially, adding a range of childhood skills (‘skills’), career-self management attributes (‘CSM’) and educational experiences (‘education’) to observe the impact of including the groups of characteristics on the elite male advantage (ES). Controls are also included in Models 1 to 3 (and Model 4 below). The characteristics included in each group were discussed in Section 3.

$$\text{Model 0: } \quad \text{elite}^{child} = \alpha_2 + \beta_1 ES + \pi_1 ED + \lambda_1 NES \quad (\text{Equation 2})$$

$$\text{Model 1: } \quad \text{elite}^{child} = \alpha_3 + \beta_2 ES + \pi_2 ED + \lambda_2 NES + \sum_{s=1}^S \lambda_s \text{skill}_s \quad (\text{Equation 3})$$

$$\text{Model 2: } \quad \text{elite}^{child} = \alpha_4 + \beta_3 ES + \pi_3 ED + \lambda_3 NES + \sum_{s=1}^S \lambda_s \text{skill}_s + \sum_{c=1}^C \lambda_c \text{CSM}_c \quad (\text{Equation 4})$$

$$\text{Model 3: } \quad \text{elite}^{child} = \alpha_5 + \beta_4 ES + \pi_4 ED + \lambda_4 NES + \sum_{s=1}^S \lambda_s \text{skill}_s + \sum_{c=1}^C \lambda_c \text{CSM}_c + \sum_{e=1}^E \lambda_e \text{education}_e \quad (\text{Equation 5})$$

The advantage of elite sons over non-elite daughters is discussed with reference to disparities in the mean values of their characteristics (childhood skills, career self-

management, educational experiences) and the subsequent returns (or penalties) to these characteristics in the labour market in terms of their association with higher (or lower) rates of access to elite occupations (from Model 3 and by split occupational type).

The disparity in the mean values of each characteristic between elite sons and non-elite daughters is also further split into a SES effect (elite daughters v non-elite daughters), a gender effect (non-elite sons v non-elite daughters) and a SES x gender effect which captures where elite sons have a third advantage in the specific characteristic (Equation 6). If the mean value of the characteristic for elite sons is significantly higher than the SES or gender effects would predict (i.e. a positive interaction value), and if this characteristic is positively associated with access to elite occupations, this suggests this characteristic can contribute to explaining not only why elite sons have higher access rates than non-elite daughters, but also why they have higher access rates than elite daughters and non-elite sons. This is useful because it highlights the source of the ‘third’ advantage for elite sons which may be otherwise obscured in non-interacted analyses. The single ‘elite son’ coefficient (ES) is therefore the focus of the discussion, with the advantages for elite daughters (ED) and non-elite sons (NES) also shown for context and to confirm they are always smaller than the advantage for elite sons even when controls are added.

$$\text{Characteristic}^{child} = \alpha_6 + \pi_5 \text{SES} + \lambda_5 \text{gender} + \delta_2 \text{SES} * \text{gender} \quad (\text{Equation 6})$$

The paper subsequently compares the raw (Model 0) and fully controlled (Model 3) marginal effects for elite sons over non-elite daughters when accessing elite careers overall, and by occupational type (managerial careers or STEM, business & law, and other public service professions). The purpose of this is to show the proportion of the raw advantage for elite sons explained and unexplained by the characteristics in the final model, both for access to elite occupations overall and by occupational type. This highlights which elite occupations show remaining barriers to access even when comparing otherwise similar individuals. The remaining unexplained advantages for elite sons reflect additional unobserved ways in which they benefit from their gender and SES characteristics to have particularly high rates of access to elite occupations compared to non-elite daughters. This may capture the joint effects of gender and SES discrimination if elite males are unjustifiably favoured by employers, or it may indicate that elite sons exhibit particularly favourable characteristics which are valuable to employers which are not captured in this analysis. This may also capture differences in career or industry preferences which are developed from an early age.

The paper lastly considers illustratively whether labour market choices ('labour') around part time work and having full time home/caring responsibilities may be two such unobserved ways in which elite sons may obtain an advantage over non-elite daughters in the elite labour market. Model 4 (Equation 7) is estimated for access to elite occupations overall and by occupational type to observe whether there is a further reduction in the elite son (ES) coefficient once these choices are incorporated. It also indicates whether there may be a remaining advantage for elite sons over non-elite daughters even once these (predominantly) gender barriers are accounted for. This brief analysis also signposts avenues for further research using more appropriate models where labour market choices can be observed prior to outcomes.

$$\begin{aligned} \text{Model 4:} \quad \text{elite}^{\text{child}} = & \alpha_7 + \beta_5 \text{ES} + \pi_6 \text{ED} + \lambda_6 \text{NES} + \sum_{s=1}^S \lambda_s \text{skill}_s + \sum_{c=1}^C \lambda_c \text{CSM}_c \\ & + \sum_{e=1}^E \lambda_e \text{education}_e + \sum_{l=1}^L \lambda_l \text{labour}_l \end{aligned} \quad (\text{Equation 7})$$

3.5 Results

3.5.1. Do sons from elite backgrounds experience a 'triple advantage' rather than a 'double advantage' over daughters from non-elite backgrounds when accessing elite occupations? (RQ1)

Access rates by SES and gender

Overall, 30.2% of individuals ever access an elite occupation in the first half of their careers, however this access rate varies substantially by SES and gender (Table 3.1A). Children from elite backgrounds are twice as likely to ever access an elite occupation than children from non-elite backgrounds (49.6% versus 26.0%, an SES gap of 23.6ppts, as seen in Chapter 2). Similarly, sons are a third more likely to ever access elite occupations than daughters (34.3% versus 25.9%, a gender gap of 8.3ppts).

SES gaps are evident in all occupational types considered (managerial careers and STEM, business & law and other public service professions), with additional gender gaps in managerial and STEM careers. The figures also show that SES gaps in access to elite occupations are larger than gender gaps in this analysis. This is also true by occupational type, even in STEM professions where gender barriers are often the focus.

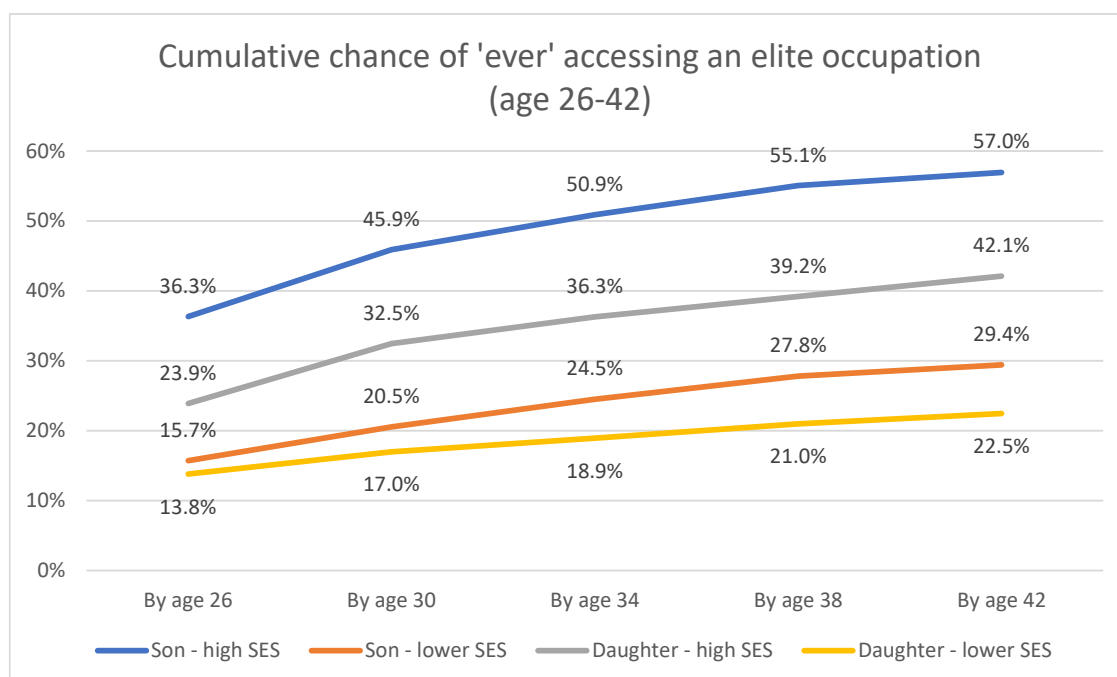
The intersection of SES and gender

As this paper focusses specifically on the intersection of SES and gender, the proportion of individuals ever accessing elite occupations by different ages is shown in Figure 1, grouped by these characteristics. In line with related literature, sons from elite

backgrounds display the highest access rates to elite occupations (McKnight, 2015). They also ‘pull away’ from the rest of the cohort during the first half of their working lives. Overall, 57.0% of sons from elite backgrounds ‘ever’ access an elite occupation in adulthood (by age 42), compared to 22.5% of daughters from non-elite backgrounds who are least likely to enter these careers (an ‘elite male advantage’ of 34.5ppts and a ratio of 2.5 times) (also shown in Table 3.1B). This demonstrates the clear occupational advantage of being both male and originating from an elite background, and the clear occupational disadvantage of being female and having a non-elite background. This advantage for elite sons is therefore a concern for all other groups (sons from non-elite backgrounds and all daughters) but is most concerning for daughters from non-elite backgrounds who face the largest disadvantage. It is therefore striking that a minority of males (18% elite) have such high success rates, on average, compared to a majority of females (82% non-elite) who are in this lowest performing group. This high success rate for elite sons compared to non-elite daughters is also evident in all elite occupational types considered – managerial careers, and professional careers in STEM, business and law and other public service (Table 3.1, Panel B).

Table 3.1: Access rates to elite occupations ‘ever’ (age 26-42) by SES and Gender

	N	Elite occupations (all)	Managerial	Professional	Professional		
					STEM	Business & law	Other public service
(A) Access rates by SES and Gender							
Sample mean	11154	30.2%	22.5%	11.0%	6.1%	3.7%	1.5%
<u>By SES</u>							
Elite	1,968	49.6%	34.0%	22.7%	12.1%	8.8%	2.8%
Non-elite	9,186	26.0%	20.0%	8.5%	4.8%	2.6%	1.2%
<u>By gender</u>							
Son	5,672	34.3%	24.7%	13.8%	9.3%	3.6%	1.3%
Daughter	5,482	25.9%	20.2%	8.1%	2.8%	3.9%	1.7%
(B) Access rates by SES and Gender - interacted							
<u>By SES x gender</u>							
Elite son	999	57.0%	37.6%	28.2%	17.9%	9.1%	2.5%
Elite daughter	969	42.1%	30.2%	16.9%	6.1%	8.5%	3.1%
Non-elite son	4,673	29.4%	21.9%	10.7%	7.5%	2.4%	1.0%
Non-elite daughter	4,513	22.5%	18.0%	6.2%	2.0%	2.9%	1.4%
<u>'Elite son advantage' (vs non -elite daughters)</u>							
Access advantage (ppt)		34.5	19.6	22.0	15.9	6.2	1.2
Ratio of access rates		2.5	2.1	4.6	8.8	3.1	1.9

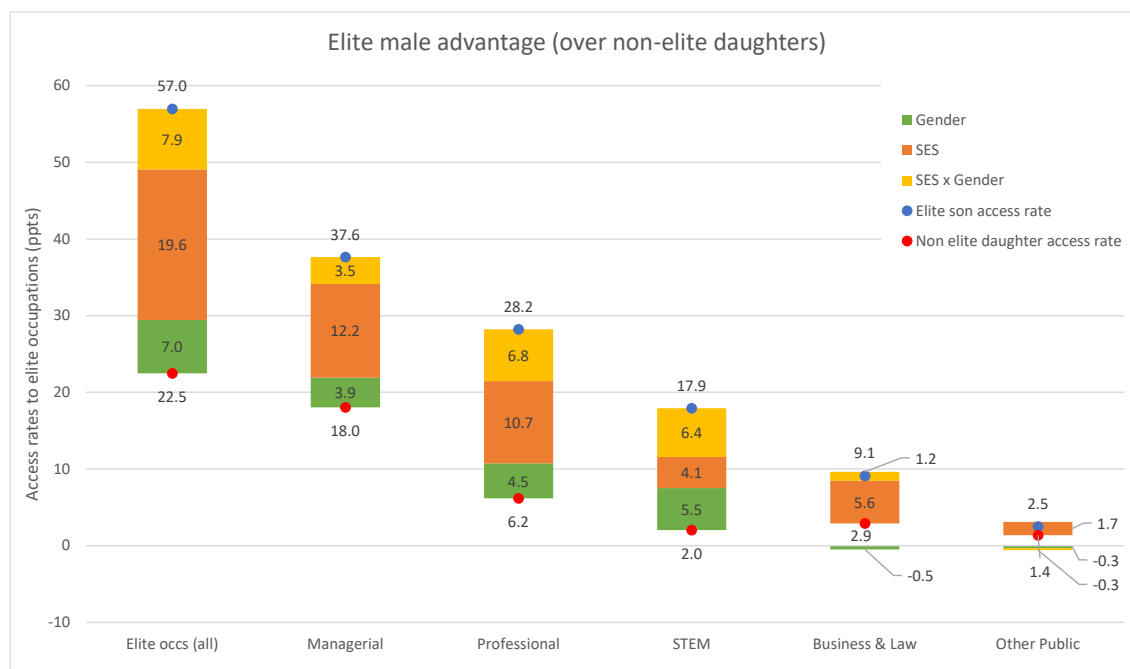
Figure 3.1: Elite occupational status by SES and gender

To test whether elite sons experience a ‘triple advantage’, Figure 3.2 (model results in Appendix A3.5) presents the marginal effects of SES, gender and a SES x gender interaction on access to elite occupations. This captures the full extent of the disparity (34.5ppt) in access rates to elite occupations between daughters from non-elite backgrounds (22.5%) and sons from elite backgrounds (57.0%) and shows the relative role of SES, gender and their interactions in driving these differences in access rates. The results identify three sources of advantage for elite sons: firstly, a socio-economic advantage due to being from an elite background (19.6ppt); secondly, a gender advantage due to being male (7.0ppt); and thirdly, an additional advantage due to being both which is attributed only to elite sons (7.9ppt). This similarly represents a triple disadvantage for daughters from non-elite backgrounds, who not only face penalties due to being female and from a non-elite background, but also face an additional third penalty due to being both. In a scenario where elite males benefit from the same SES advantage of 19.6ppt as elite daughters (vs non-elite daughters) and the same gender advantage of 7.0ppt as non-elite sons (vs non-elite daughters), they would experience a ‘double advantage’ over non-elite daughters (who have an access rate of 22.5%). In that case, we would expect 49.1% of elite males to ever access an elite occupation. However, their access rate is much higher at 57.0%. This is 7.9ppt larger than we would expect given the SES and gender gaps experienced by their peers. This confirms that elite sons face a ‘triple advantage’ and not simply a ‘double advantage’ over non-elite daughters when accessing elite occupations. These raw figures suggest that SES explains over half (56.9%) of the 34.5ppt access gap

between elite sons and non-elite daughters; gender explains 20.2% and the interaction of SES and gender explains almost a quarter (22.9%). The analysis in RQ2 goes on to explore how the picture changes once controls are added for other ways in which those from different socio-economic backgrounds or gender differ.

The ‘triple advantage’ for elite males is especially large in professional careers, particularly STEM professions where elite sons are nearly nine times more likely to access these careers than non-elite daughters (17.9% compared to 2.0%) (Table 3.1-B). In STEM careers, elite sons benefit from a SES advantage of 4.1ppt, a gender advantage of 5.5ppt and a third advantage of being both elite and male of 6.4ppt, which is the largest of the three effects and represents 40% of the raw access gap (6.4ppt out of 15.9ppt). In other professions (Business & Law and other public service), it appears that the main barriers to accessing these careers relate to social background rather than gender. In managerial careers, both social background (12.2ppt; two-thirds of the raw access gap) and gender (3.9ppt; 20% of the raw access gap) barriers are a concern, however despite the third advantage of being elite and male being modest (3.5ppt, 18% of the access gap) it is non-significant.

Figure 3.2: Access gaps to elite occupations, by occupational type



Summary

Elite sons benefit from a large ‘triple advantage’ over non-elite daughters when accessing elite occupations. Elite sons have the highest access rates to elite occupations (managerial careers and STEM, business and law professions) and non-elite daughters have the

lowest. The triple advantage of elite sons is driven by social background barriers in all elite occupational groups considered; additional gender gaps in managerial careers and STEM professions; and a large third advantage for elite sons (and disadvantage for non-elite daughters) in accessing STEM professions due to the interaction of their SES and gender characteristics.

3.5.2. Can disparities in childhood skills, career self-management and educational experiences account for the ‘elite male advantage’ in access to elite occupations? (RQ2)

Sons from elite backgrounds have a significant advantage over daughters from non-elite backgrounds when accessing elite occupations (shown in RQ1) which is exacerbated by the interaction of their SES and gender characteristics. To explain this elite male advantage, Table 3.2⁴⁰ presents the marginal effect of being an elite son rather than a non-elite daughter on accessing elite occupations (34.5ppts, Model 0) with subsequent models incorporating measures of childhood skills (Model 1), career self-management (Model 2) and educational experiences (Model 3). Marginal effects faced by elite daughters and non-elite sons relative to non-elite daughters are also shown for context.

The key characteristics which explain the 34.5ppt elite male advantage over non-elite daughters are those which display both a significant association with access to any elite occupation (either overall, or to any specific occupational sub-group shown in Appendix A3.7⁴¹) and a significant disparity in the mean value of the characteristic between elite sons and non-elite daughters (Appendix A3.3). These numerous attributes are listed in Table 3.3, and comprise childhood skills, career self-management attributes and educational experiences. The raw differences in mean characteristics between elite sons and non-elite daughters are shown in Column 1. Groups of characteristics and skills are added roughly chronologically in Models 1, 2 and 3, with disparities in these groups of skills explaining the reduction in the elite son coefficient in Table 3.2 from Model 0 to Model 3. The fact that each set of characteristics contributes to explaining the gap suggests that elite sons accumulate a portfolio of advantages throughout their life which explain their success in the elite labour market.

⁴⁰ Full models shown in Appendix A3.6.

⁴¹ Reading ability is also included as it is significant in Model 1 in Appendix A3.6 but is associated with access to elite occupations via its influence on later educational outcomes, therefore it is non-significant in the Model 3 but remains part of the explanation for elite male success.

Table 3.2: Marginal effects of SES and gender characteristics on access to elite occupations

	Model 0			Model 1			Model 2			Model 3		
	Coeff.	Std. Err.	Sig.	Coeff.	Std. Err.	Sig.	Coeff.	Std. Err.	Sig.	Coeff.	Std. Err.	Sig.
<u>SES and Gender</u>												
Elite son	0.345	0.016	***	0.287	0.019	***	0.248	0.020	***	0.190	0.021	***
Elite daughter	0.196	0.016	***	0.102	0.018	***	0.063	0.018	***	0.014	0.018	
Non-elite son	0.070	0.009	***	0.110	0.011	***	0.114	0.011	***	0.110	0.012	***
Non-elite daughter (base 22.5%)												
<u>Controls</u>												
Demographics				✓			✓			✓		
Childhood skills (age 10)				✓			✓			✓		
Career self-management (age 16)							✓			✓		
Educational attainment (age 16+)										✓		
R-squared	0.048			0.120			0.136			0.178		
N	11154			11154			11154			11154		

*** 99% confidence ** 95% confidence * 90% confidence

Controls included for demographics (ethnicity, UK region of origin, non-UK, mother's and father's age at birth, number of survey waves present); childhood skills at age 10 (cognitive and non cognitive); career self-management at age 16 (aspirations, networks and work experience) and educational experiences at age 16+ (school type and attainment).

Table 3.3: Key characteristics which explain the elite male advantage in access to elite occupations

Type 1 or 2	(1)			(2)	(3)			(4)			(5) Raw difference in means split in interacted model								
	Raw difference in means			Proportion of the elite son advantage (34.5ppt) accounted for by each characteristic	Raw SES gap			Raw gender gap			Elite daughter (vs non-elite daughter)			Non-elite son (vs non-elite daughter)			Additional third advantage for elite sons		
	Elite sons (vs non-elite daughters)				Elite vs non-elite background			Sons vs daughters			SES term			Gender term			Interaction term		
	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.	
<i>Childhood skills (age 10)</i>																			
Locus of Control	1	0.471	0.031 ***	1.6%	0.474	0.022 ***	0.008	0.017		0.493	0.032 ***	0.015	0.019		-0.037	0.044			
Self esteem	1	0.431	0.032 ***	0.2%	0.249	0.023 ***	0.205	0.017 ***		0.286	0.032 ***	0.218	0.019 ***		-0.073	0.045			
Academic self concept	1	0.190	0.032 ***	0.3%	0.183	0.022 ***	0.037	0.017 **		0.232	0.032 ***	0.054	0.019 ***		-0.097	0.045 **			
Application	1	0.067	0.029 **	0.3%	0.362	0.022 ***	-0.315	0.017 ***		0.328	0.031 ***	-0.326	0.018 ***		0.065	0.043			
Social skill	1	0.116	0.032 ***	0.6%	0.164	0.023 ***	-0.034	0.018 *		0.188	0.033 ***	-0.025	0.020		-0.047	0.047			
Reading	1	0.461	0.028 ***	1.5%	0.591	0.021 ***	-0.141	0.016 ***		0.573	0.029 ***	-0.147	0.017 ***		0.034	0.041			
Maths	1	0.677	0.028 ***	6.1%	0.559	0.021 ***	0.101	0.016 ***		0.532	0.029 ***	0.093	0.017 ***		0.053	0.041			
Language comprehension	1	0.687	0.030 ***	2.6%	0.542	0.022 ***	0.132	0.017 ***		0.522	0.031 ***	0.125	0.018 ***		0.040	0.044			
<i>Career self-management (age 16)</i>																			
High wage	1	0.025	0.006 ***	0.4%	0.002	0.004	0.026	0.003 ***		0.005	0.005	0.027	0.003 ***		-0.007	0.007			
Promotion	1	0.073	0.008 ***	0.7%	0.053	0.005 ***	0.019	0.004 ***		0.052	0.007 ***	0.018	0.004 ***		0.003	0.010			
Challenge	1	0.036	0.009 ***	0.7%	0.050	0.006 ***	-0.005	0.004		0.064	0.008 ***	0.000	0.005		-0.028	0.011 **			
Security	1	0.046	0.007 ***	0.7%	0.034	0.004 ***	0.020	0.003 ***		0.046	0.006 ***	0.024	0.004 ***		-0.024	0.009 ***			
Professional aspirations	2	0.269	0.012 ***	4.6%	0.212	0.008 ***	0.044	0.006 ***		0.191	0.012 ***	0.037	0.007 ***		0.042	0.016 **			
Commerical awareness	1	0.218	0.019 ***	1.6%	0.342	0.013 ***	-0.118	0.011 ***		0.350	0.019 ***	-0.114	0.011 ***		-0.017	0.027			
<i>Educational experiences (age 16+)</i>																			
Private school	2	0.168	0.007 ***	3.0%	0.137	0.005 ***	0.012	0.004 ***		0.107	0.007 ***	0.002	0.004		0.060	0.010 ***			
No. good GCSEs	2	2.517	0.110 ***	9.9%	2.867	0.077 ***	-0.437	0.062 ***		2.728	0.109 ***	-0.483	0.064 ***		0.271	0.153 *			
No. good A-levels	1	0.756	0.031 ***	2.1%	0.770	0.021 ***	-0.019	0.017		0.763	0.031 ***	-0.021	0.018		0.014	0.043			
Degree * Russell * 1st or 2:1	1	0.052	0.005 ***	2.8%	0.054	0.003 ***	-0.003	0.003		0.052	0.005 ***	-0.003	0.003		0.003	0.007			
Degree * Russell * 2:2, 3rd, pass	1	0.040	0.004 ***	1.4%	0.034	0.003 ***	0.004	0.002		0.032	0.004 ***	0.003	0.003		0.005	0.006			
Degree * Non-Russell * 1st or 2:1	1	0.064	0.007 ***	2.4%	0.077	0.005 ***	-0.007	0.004 *		0.086	0.007 ***	-0.004	0.004		-0.018	0.010 *			
Degree * Non-Russell * 2:2, 3rd, pass	1	0.070	0.007 ***	2.2%	0.062	0.005 ***	0.004	0.004		0.057	0.007 ***	0.002	0.004		0.011	0.010			
Degree * STEM	2	0.116	0.007 ***	1.6%	0.075	0.005 ***	0.031	0.004 ***		0.058	0.007 ***	0.025	0.004 ***		0.032	0.010 ***			
Degree * LEM	1	0.048	0.005 ***	1.9%	0.046	0.004 ***	0.003	0.003		0.046	0.005 ***	0.003	0.003		-0.001	0.007			
Higher degree	2	0.054	0.005 ***	0.8%	0.039	0.003 ***	0.008	0.003 ***		0.026	0.005 ***	0.003	0.003		0.025	0.007 ***			

Note: Other characteristics for which there is no significant difference in means between elite sons and non-elite daughters are not shown. Similarly, characteristics which are not predictive of access to any elite occupation are not shown. If they were included, the total accounted for by all characteristics would be 44.8% as shown later on Table 3.4. The proportion accounted for by each characteristic is calculated as the difference in the means between elite sons and non-elite daughters, multiplied by coefficients from Model 3.

The aim of the analysis is not to explore each of these characteristics separately⁴², but rather to identify where SES and gender may intersect to increase the chances of elite sons accessing elite occupations and decrease the chances of non-elite daughters accessing these careers, to a greater extent than we may expect from observing the SES and gender gaps alone. Therefore, to explore the intersecting role of SES and gender in access to elite occupations, the key characteristics which explain the 34.5ppt elite male advantage over non-elite daughters can be grouped into two types (as highlighted on Table 3.3) – Type 1, which do *not* reveal more (dis)advantage than we might expect, and Type 2, which do, and are the focus of further discussion.

Firstly, Type 1 characteristics are those which *do not* confer any additional advantage on elite sons over and above the SES and/or gender advantages which may be experienced by their peers. These are identified by an SES x gender interaction term which is either non-significant⁴³ or which has a sign opposite to that of the SES and gender terms⁴⁴ (Column 7). Specifically, these are non-cognitive skills (locus of control, self-esteem, academic self-concept, application and social skill); cognitive ability (reading, maths and language comprehension), career self-management (aspirations of high wage, promotion, challenge and security and commercial awareness); and educational attainment (number of ‘good’ A-levels, obtaining an undergraduate degree, studying a LEM undergraduate degree). For these characteristics, targeting SES and gender disparities in isolation would be a reasonable approach to reducing the advantage of elite sons over non-elite daughters when accessing elite occupations. This is because there is no significant hidden additional advantage for elite sons or disadvantage for non-elite daughters related to these attributes. For Type 1 characteristics, Columns 3 and 4 show that raw SES gaps exist in all cases (except higher wages) favouring higher SES individuals and gender gaps favouring boys occur in self-esteem, academic self-concept, maths ability, language comprehension and aspirations of high wages, promotion and security. Furthermore, where there are *both* SES and gender gaps but no significant interaction (found here for self-esteem, maths, language comprehension and aspirations of promotion) daughters from non-elite backgrounds face a ‘double’ disadvantage compared to elite sons.

⁴² Although GCSE attainment, maths ability and professional aspirations appear particularly important for explaining the gap in access to elite occupations between elite sons and non-elite daughters (Column 2). These three attributes alone account for 20% of the access gap.

⁴³ This indicates that elite sons face similar SES disparities to elite daughters and similar gender disparities to non-elite sons (all versus non elite daughters).

⁴⁴ In this case the gap between elite sons and non-elite daughters is significant, but it is smaller than the individual SES and gender gaps predict meaning there is no additional third advantage for elite sons.

Secondly, Type 2 characteristics are those which *do* confer an additional advantage on elite sons over and above the SES and/or gender advantages which may be experienced by their peers. These are identified by an SES x gender interaction term which is positive and significant (Column 7), meaning that the SES gaps in these characteristics are larger for sons than for daughters. Specifically, these are professional aspirations, private schooling, attainment at GCSE, STEM undergraduate degrees and obtaining a postgraduate degree. Together these five characteristics account for one fifth (20.0%, summed from Column 2) of the 34.5ppt gap in access to elite occupations between elite sons and non-elite daughters. For these five key characteristics, elite sons have an additional ‘third’ advantage related to the intersection of their SES and gender characteristics which is unavailable to their peers. These interactions therefore not only help to explain why the access rates of elite sons to elite occupations are higher than those for non-elite daughters, but also why elite sons perform better than elite daughters and non-elite sons.

Policies targeting SES and gender disparities in these five attributes in isolation may therefore only be partially effective as they could overlook a significant element of the advantage for elite sons and disadvantage for non-elite daughters when accessing elite occupations. Clearly if separate SES and gender gaps in all personal attributes are reduced to zero this would also eliminate all endowment gaps between elite sons and non-elite daughters. However, the contribution of this analysis is to show that in order to work towards this reduction, identification of the specific advantages faced by elite sons and specific disadvantages faced by non-elite daughters is required to design effective interventions. Awareness is therefore required that SES and gender characteristics can combine to favour males from elite backgrounds and penalise females from non-elite backgrounds *even more* than the separate SES and gender gaps in these characteristics would predict. These characteristics are now explained in turn.

Professional aspirations

By age 16, elite sons are almost twice as likely as non-elite daughters (57.2% vs 30.3%) to report professional aspirations (defined as the desire to pursue a career which requires a degree). Here, elite sons benefit from a triple advantage of being elite (19.1ppt), male (3.7ppt) and both (4.2ppt). Teenage sons from elite backgrounds therefore have considerably higher professional aspirations than the SES and gender disparities of their peers would predict (elite daughters and non-elite sons respectively). These aspirations

influence occupational outcomes as they are particularly predictive of access to STEM, business and law professions, although not to managerial careers.

Private school

A fifth (20.4%) of elite sons attend private school at age 16 compared to only 3.6 % of non-elite daughters, a gap of 16.8ppt. Here, elite sons benefit from being elite (10.7ppt), and both male and elite (6.0ppt) (the gender difference in attendance for non-elite children is not significant). This therefore reflects the established relationship between social background and private education (e.g. Reeves et al., 2017) and further shows even higher attendance for elite sons. The data show that elite families have a particular preference for educating their sons at private school (elite sons 20.4%, elite daughters 14.2%), while being more likely to choose grammar schools for their daughters (elite sons 7.6%, elite daughters 9.7%). This preference for private schooling elite sons provides a significant reward over other characteristics when accessing elite occupations, especially business & law professions. This preference may logically reflect the greater returns to private schooling for sons than daughters which has been documented elsewhere (Green, Henseke & Vignoles 2017; Green et al., 2018).

GCSE attainment

Educational attainment at GCSE also drives the advantage for elite sons, but not in the way we might expect (i.e. they are not the highest performers). Overall, girls outperform boys, but this is outweighed by larger SES gaps, meaning elite sons outperform non-elite daughters overall (although elite daughters perform the best and non-elite sons perform the worst as per related literature). Elite sons obtain an average of 5.8 ‘good’ GCSEs (‘good’ is defined as grade A-C), compared to 3.3 good GCSEs for non-elite daughters. The positive interaction result in Table 3.3 is driven by the poor performance of non-elite sons. The poor performance of this group means that elite sons receive a greater ‘attainment boost’ at GCSE-level than elite daughters from being from a high SES background (interaction value is 0.27 good GCSEs). This means that although elite sons are not the highest performers, they have higher GCSE attainment than the SES and gender gaps of their peers would predict. These disparities are important because academic attainment is predictive of access to both managerial and professional careers (STEM, business & law professions), and good GCSEs remain predictive of access to elite careers even over and above A-levels and university qualifications.

University choices – STEM and postgraduate degrees

At university, the gap in educational outcomes is further widened between elite sons and non-elite daughters due to differences in obtaining STEM undergraduate degrees and obtaining postgraduate degrees. As might be expected, STEM undergraduate degrees are highly predictive of accessing STEM professions, even when comparing otherwise similar individuals. However, elite sons are over six times more likely to study STEM degrees than non-elite daughters (13.9% v 2.3%). This partly reflects the overall SES gap in obtaining an undergraduate degree (there is no gender gap in obtaining an undergraduate degree in this sample) however, even comparing sons and daughters from the same social background (elite or non-elite), sons are around twice as likely to study STEM degrees and daughters are around twice as likely to study OSSAH degrees⁴⁵⁴⁶. The overall disparity in obtaining a STEM degree is therefore related to being higher SES (5.8ppt), male (2.5ppt) and being both (3.2ppt). This may derive both from elite sons being the highest performers in maths (captured at age 10 in this analysis) and females from lower SES background being less likely to choose STEM A-levels (Codioli, 2017).

Postgraduate degrees are also predictive of access to elite occupations, particularly STEM and other public service professions, although are only obtained by 2.2% of the cohort, ranging from 1.3% of non-elite daughters to 6.7% of elite sons. This reflects advantages for being higher SES (2.6ppt) plus an extra advantage for being an elite son (2.5ppt) (the gender difference in obtaining a postgraduate degree for students from non-elite backgrounds is not significant).

Unexplained access gaps

The results so far have shown that elite sons are substantially more likely to access elite occupations than non-elite daughters, and that this advantage can be partially explained by SES and gender differences in a range of childhood characteristics, including five characteristics where SES and gender interact to further advantage elite sons (professional aspirations, private schooling, GCSE attainment, STEM undergraduate degrees and obtaining a postgraduate degree). However, despite allowing for disparities in a range of educational and non-educational attributes a concerning unexplained advantage of

⁴⁵ This is seen in Appendix A3.3, where 13.9% of elite sons study STEM degrees compared to 8.1% of elite daughters, whereas 15.8% of elite daughters study OSSAH degrees compared to 8.0% of elite sons. There is a similar pattern for young people from non-elite backgrounds.

⁴⁶ In fact, OSSAH degrees are not positively associated with access to any elite occupations and are even negatively associated with access to managerial careers (Appendix A3.7).

19.0ppt for elite sons over comparable non-elite daughters remains (Table 3.2, Model 3)⁴⁷. This unexplained element represents over half (55%) of the raw 34.5ppt access gap to elite occupations. It comprises unexplained advantages relating to being from a higher SES background (1.4ppt non-significant, the elite daughter coefficient), being male (11.0ppt, the non-elite son coefficient) and being both (the remaining 6.6ppt totalling 19.0ppt overall advantage for elite sons). It should be noted that this remaining unexplained advantage for elite sons is likely to be underestimated as the non-elite daughter comparison group has the same level of childhood skills, career self-management and educational attainment as elite sons despite being from a non-elite background, so they are an over-performing group of non-elite daughters (the issue of ‘bad controls’).

The following analysis explores this unexplained advantage further by identifying which sub-group(s) of elite occupations (managerial careers or professions in STEM, business & law and other public service) may exhibit remaining unexplained barriers to access even when comparing otherwise similar individuals. Table 3.4 presents the raw gap in access to these groups of elite careers between elite sons and non-elite daughters (Panel A) followed by the remaining unexplained gap once otherwise similar individuals are compared (Panel B) and the proportions of the raw access gap the explained and unexplained elements represent (Panel C). Remaining unexplained advantages for elite daughters and non-elite sons are also shown for context (Panel B).

The results show that elite sons are still almost twice (1.8 times) as likely to ever access an elite occupation in adulthood than non-elite daughters (19.0ppt advantage over the base 22.5% access rate), even when they have similar demographics, childhood skills, career self-management and educational experiences (Panel B). These remaining unexplained elite male advantages occur in managerial careers and STEM, business and law professions. Specifically, elite sons are 1.5 times more likely than similar non-elite daughters to ever access a managerial career (9.7ppt over 18.0%), 6.2 times more likely to access a professional career in STEM (10.6ppt over 2.0%) and 1.2 times more likely to access business and law professions (0.7ppt over 2.9ppt). There is no remaining significant unexplained elite male advantage in accessing other public service professions

⁴⁷ For context, advantages for elite daughters are fully explained by Model 3 (childhood skills, career self-management and educational experiences), whereas an advantage for non-elite sons also remains over and above these characteristics. These results are in line with prior literature which find unexplained gender gaps in access to elite occupations even once skills and education are accounted for (McKnight, 2015; Sullivan, 2018a & 2018b).

once otherwise similar individuals are compared, meaning the small raw advantage of elite sons over non-elite daughters when accessing these careers is explained by disparities in the mean values of the characteristics included in the analysis. In addition to these advantages for elite sons, remaining advantages are also apparent for non-elite sons (in managerial careers and STEM professions) and elite daughters (in STEM professions).

There are therefore remaining unexplained diversity barriers in all occupational groups except other public service professions. Managerial careers and STEM professions show the most cause for concern here. Even when comparing otherwise similar individuals, managerial careers appear to favour elite sons and non-elite sons, suggesting gender diversity is a key area for improvement (in addition to the SES gaps explained by the analysis). In STEM professions all three groups of individuals (elite sons, elite daughters and non-elite sons) experience an unexplained advantage over non-elite daughters, with elite sons having the largest remaining unexplained advantage. Barriers relating to SES, gender and the intersection of these therefore appear to remain an issue in STEM professions even when comparing otherwise similar individuals. Furthermore, the final model leaves half (49.6%) of the elite male advantage over non-elite daughters in managerial careers unexplained (the marginal effect reduces from 19.6ppt to 9.7ppt). and two-thirds (66.5%) of the elite male advantage in STEM professions unexplained (the marginal effect reduces from 15.9ppt to 10.6ppt) (Panel C). These figures are large compared to only 10.8% of the gap remaining unexplained in business and law careers. These unexplained advantages require further exploration to identify which attributes are being rewarded in these careers.

Table 3.4: Raw and unexplained advantages in access to elite occupations

Panel A: No controls																			
	Elite occupations (all)			Managerial			Professional			Professional									
										STEM			Business & law			Other public service			
	Coeff.	Std. Err.	Sig.	Coeff.	Std. Err.	Sig.	Coeff.	Std. Err.	Sig.	Coeff.	Std. Err.	Sig.	Coeff.	Std. Err.	Sig.	Coeff.	Std. Err.	Sig.	
<u>SES and Gender</u>																			
Elite son	0.345	0.016	***	0.196	0.014	***	0.220	0.011	***	0.159	0.008	***	0.062	0.007	***	0.012	0.004	***	
Elite daughter	0.196	0.016	***	0.122	0.015	***	0.107	0.011	***	0.041	0.008	***	0.056	0.007	***	0.017	0.004	***	
Non-elite son	0.070	0.009	***	0.039	0.009	***	0.045	0.006	***	0.055	0.005	***	-0.005	0.004		-0.003	0.003		
Non-elite daughter (base cat)	22.5%			18.0%			6.2%			2.0%			2.9%			1.4%			
R-squared	0.048			0.019			0.040			0.035			0.015			0.003			
N	11154			11154			11154			11154			11154			11154			
<i>Ratio elite son to non-elite daughter</i>	2.5			2.1			4.6			8.8			3.1			1.9			
Panel B: Remaining unexplained effects																			
	Elite occupations (all)			Managerial			Professional			Professional									
										STEM			Business & law			Other public service			
	Coeff.	Std. Err.	Sig.	Coeff.	Std. Err.	Sig.	Coeff.	Std. Err.	Sig.	Coeff.	Std. Err.	Sig.	Coeff.	Std. Err.	Sig.	Coeff.	Std. Err.	Sig.	
<u>SES and Gender</u>																			
Elite son	0.190	0.021	***	0.097	0.018	***	0.100	0.015	***	0.106	0.015	***	0.007	0.004	*	0.000	0.001		
Elite daughter	0.014	0.018		0.009	0.015		0.016	0.010	*	0.015	0.008	**	0.003	0.004		0.000	0.001		
Non-elite son	0.110	0.012	***	0.065	0.010	***	0.056	0.007	***	0.057	0.006	***	0.000	0.003		0.001	0.001		
Non-elite daughter (base cat)	22.5%			18.0%			6.2%			2.0%			2.9%			1.4%			
R-squared	0.178			0.103			0.235			0.236			0.237			0.197			
N	11154			11154			11154			11154			11154			11154			
<i>Ratio elite son to non-elite daughter</i>	1.8			1.5			2.6			6.2			1.2			1.0			
Panel C: Proportion of elite male advantage explained by the model																			
% explained	44.8%			50.4%			54.8%			33.5%			89.2%			101.6%			
% unexplained	55.2%			49.6%			45.2%			66.5%			10.8%			-1.6%			

*** 99% confidence ** 95% confidence * 90% confidence

Controls in Panel B include demographics, childhood skills, career self-management behaviours and educational experiences

Labour market choices

The results show that although demographics, childhood skills, career self-management, educational experiences explain 44.8% (Panel C) of the overall gap between elite sons and non-elite daughters when accessing elite careers (the marginal effect reduces from 34.5ppt to 19.0ppt), the majority of this is related to explaining SES barriers (the elite daughters vs non-elite daughters gap becomes non-significant) rather than gender barriers (the elite and non-elite sons⁴⁸ vs non-elite daughters gaps remain significant). This therefore raises the question of whether the remaining gender advantage for elite sons (and non-elite sons) over non-elite daughters could be accounted for by gender disparities in labour market choices during the first half of an individual's career, such as working part time or taking a career break for full-time family responsibilities.

However, in this analysis these choices would occur during the same time frame (age 26-42) as occupational outcomes are observed, making it challenging to untangle whether labour market choices predict access to elite occupations, and/or vice versa. Nonetheless, Appendix A3.8 illustratively shows the effect of incorporating labour market choices into the analysis (adding them as extra controls to Panel B) to observe whether the advantages for elite sons might remain. The figures show that large disparities in labour market choices could be an important source of occupational advantage for elite sons and disadvantage for non-elite females in accessing elite careers. These choices could fully explain the large remaining advantage for elite sons in accessing managerial careers and the smaller remaining advantage for elite sons in accessing business and law professions. They could also partially explain advantages for elite sons when accessing STEM professions.

Disparities in labour market choices are predominantly related to gender, although they also vary by SES to a lesser extent. Incorporating labour market choices shows the proportion explained of the advantage of elite sons when accessing elite occupations overall could increase from 44.8% to 78.1%. However, the illustrative results suggest that even after controlling for labour market choices, advantages are still likely to remain for elite sons when accessing elite occupations overall (as 22% of the gap remains unexplained overall) and for elite sons (and elite daughters and non-elite sons) when

⁴⁸ The increase in the non-elite son coefficient from Model 0 to 1 particularly reflects that non-elite daughters have higher levels of application and reading ability which is associated with accessing elite occupations. Therefore, once this is controlled for, boys do even better in the elite labour market than expected given their characteristics.

accessing STEM professions. Therefore, in addition to further exploration of which additional attributes, career preferences or recruiter biases may predict access to these careers, further analysis is required of the role of labour market choices in accessing elite occupations (specifically where choices are observed before outcomes).

Summary

This analysis has confirmed that disparities in childhood skills, career self-management and educational experiences all contribute to explaining why elite sons have higher access rates to elite occupations than non-elite daughters. In five cases (professional aspirations, private schooling, GCSE attainment, STEM undergraduate degrees and obtaining a postgraduate degree) the disparity between elite sons and non-elite daughters is larger than the SES and gender gaps faced their peers would predict, indicating an additional ‘third’ advantage specifically for elite sons or disadvantage for non-elite daughters which may not otherwise be identified in separate SES or gender analysis. This provides further support for considering the intersection of SES and gender when exploring specific barriers to elite occupations to try to capture the full extent of the disparities in characteristics between elite sons and non-elite daughters.

This analysis also reveals that elite sons are significantly more likely than non-elite daughters to access elite occupations overall, and managerial careers and STEM, business and law professions, even when comparing otherwise similar individuals. Managerial roles and STEM professions show the most cause for concern where respectively half and two-thirds of the elite male advantage over non elite daughters remains unexplained. Therefore, even if SES and gender gaps are eliminated from all the skill, career self-management and educational attributes considered in this analysis, elite sons would still have a substantial occupational advantage over non-elite daughters.

Labour market choices around part time working and caring responsibilities appear to be potentially important barriers to elite occupations. These choices may explain the remaining access gap (between elite sons and non-elite daughters) in managerial careers and business and law professions and may also explain part of the remaining access gap in STEM careers.

3.6 Discussion and conclusions

Contribution to existing literature

This paper has examined the access gap to elite occupations between sons from elite backgrounds and daughters from non-elite backgrounds, in particular focussing on the role played by the intersection of SES and gender. The paper makes several contributions to prior literature.

Firstly, it provides new evidence that sons from elite backgrounds benefit from a large ‘triple advantage’ over non-elite daughters when accessing elite occupations over the first half of their career. This derives not only from their SES and gender characteristics in isolation (a ‘double advantage’) but also from the interaction of these. The interaction of social background and gender is particularly large in access to STEM professions. This analysis complements similar findings elsewhere relating to progression *within* elite occupations (Friedman & Laurison 2020, Friedman, Laurison & Macmillan, 2017), but extends this analysis to earlier in the recruitment pipeline to address barriers to *access*. It also extends the warning made by Woodhams, Lupton & Cowling (2015), that policies which target protected characteristics in isolation risk overlooking important elements of disadvantage, including social background.

Secondly, by extending explanatory characteristics beyond cognitive skills, school type and attainment (those considered by McKnight (2015) and Sullivan (2018a&b)) to include a wider range of non-cognitive skills in childhood; career self-management behaviours (such as aspirations, use of networks and work experience); degree class; obtaining a postgraduate degree; and labour market choices around part-time work and parental leave, it addresses the puzzle of why elite sons have the highest access rates to elite occupations despite not having the highest levels of educational attainment. It reveals two important sets of attributes which together explain 45% of the access gap: those which vary by SES and/or gender separately (i.e. no interaction favouring elite sons) to benefit elite sons either with a single or double advantage; and those for which SES and gender intersect to provide an additional ‘third’ advantage for elite sons which is *even larger* than the SES and gender gaps in isolation would predict. This second group comprises professional aspirations, private schooling, attainment at GCSE, obtaining a STEM undergraduate degree, and having a postgraduate degree. Sons from elite backgrounds therefore benefit in the elite labour market from having higher endowments of these five attributes than the SES and gender gaps experienced by their peers would

predict. The results also show that even when accounting for disparities in a range of skill, career self-management and education experiences, 55% of the advantage of elite sons over non-elite daughters remains unexplained.

Thirdly, by analysing outcomes by occupational type, the results reveal advantages for elite sons over non-elite daughters in managerial careers, and STEM and business & law professions which remain even when comparing individuals with similar characteristics (childhood skills, career self-management behaviours and educational experiences). SES gaps are also shown to be larger than gender gaps in all elite occupations, even in STEM professions where gender is often the focus. Managerial roles and STEM professions show the most cause for concern where respectively half and two-thirds of the elite male advantage over non-elite daughters remains unexplained. Illustrative analysis suggests that heavily gendered labour market choices around part time work and caring responsibilities are potentially important barriers to elite occupations, possibly explaining the remaining access gaps in managerial careers and business and law professions, but only partly explaining access gaps in STEM professions.

Implications for policy makers and employers

While the analysis undertaken in this paper is descriptive rather than causal, the findings provide strong indicative evidence for policy and practice. From an employer perspective, the primary recommendation is that elite recruiters should collect applicant data on social background in addition to protected characteristics (as per current government guidance such as SMC (2021a)). This will enable them to monitor and address gaps in recruitment not only by SES, but also between applicants with multiple advantages or disadvantages (such as SES x gender here). This will reveal any significant access gaps between the most and least advantaged groups which are unobserved using existing metrics. The stronger the intersection of SES and gender in an industry (such as STEM), the less likely it is that treating barriers in isolation will eliminate the access gaps. Assessing these interactions at each stage of the recruitment process will also reveal to employers where they ‘lose’ diversity and highlight the most useful areas for intervention.

It would also be valuable to increase awareness among recruiters that SES and gender characteristics intersect not only in educational attainment at school, but also in many other areas such as graduate job aspirations, private school attendance, degree subject choice and postgraduate study to favour males from elite backgrounds and penalise females from non-elite backgrounds *even more* than the separate SES and gender gaps in

these characteristics would predict. Employers who regard these characteristics as indicators of merit which are to be rewarded in the recruitment process will therefore struggle to remove any intersectional bias faced by non-elite daughters. Employers should therefore be encouraged to consider an applicant's achievements in the context of both their gender and SES characteristics to accommodate gaps in achievements between candidates which have developed since childhood. This may include recruiting high potential females from non-elite backgrounds using contextual recruitment tools (such as those which identify candidates with high academic performance compared to their school peers) and providing additional training to address any specific skills gaps relevant to the role. This allows employers to create a more level playing field for applicants even when gaps in achievements are not reduced by government policy interventions. Employer outreach activities with schools and universities are also able to encourage aspirations and applications from lower SES females to improve the diversity of entry-level cohorts. Even in cases where SES and gender do not intersect, non-elite females can still face a 'double disadvantage' from their characteristics, such as in maths and language comprehension, self-esteem, promotion aspirations and preferences around working patterns. Employers who aspire to be inclusive and meritocratic, but whose personnel decisions appear to favour elite males, should therefore review all recruitment and promotion processes and consider whether there is any evidence of bias, and then introduce policies to equalise opportunities such as encouraging promotion applications from lower SES women and ensuring all employees feel able to request flexible working patterns.

From a government policy perspective, the descriptive findings provide suggestive support for interventions to close the full extent of the gap between higher SES sons and lower SES daughters in childhood cognitive skills (especially SES and gender gaps in maths), career self-management (especially SES and gender gaps in graduate jobs aspirations), educational attainment (especially SES gaps in GCSE grades) and labour market choices (such as gender gaps in the uptake of part-time roles and shared parental leave). In terms of addressing the intersectional disadvantage specifically, any school-level interventions which encourage high potential girls from non-elite backgrounds to have professional aspirations and apply for undergraduate degrees in STEM or postgraduate study are likely to improve the diversity of the workforce in elite occupations and reduce the 'elite male advantage'. The findings would also support calls for social background to become a protected characteristic in UK law alongside gender (SMC 2021b). Non-elite females do not simply face an 8.3ppt gender gap (sample mean)

in access to elite occupations, they face a 34.5ppt gap compared to men from elite backgrounds (57.0% vs 22.5% access rates), meaning the majority of their disadvantage is currently unprotected.

Avenues for further research

The findings suggest some useful avenues for future research. Firstly, it would be valuable to establish whether these gaps in access to elite occupations persist for young people entering the labour market today, approximately 30 years after the BCS70 cohort. ONS (2021) data shows that gender pay gaps have gradually reduced over recent decades and have continued to fall since gender pay gap reporting was introduced in 2017. They are also smaller for under 40s than over 40s. However, this is not as positive as it may seem since this mid-career divergence is due to a lower incidence of women entering higher-paid managerial occupations from age 40 onwards. Other reports further show progress on equalising opportunities for women mid-career has been slow, for example only 2% of eligible couples have taken shared parental leave since it was introduced in 2015 (BBC, 2018; Taylor, 2020). SES gaps in access to elite careers also remain for more recent cohorts of young people in early stages of their career (in 2000s: Britton et al., 2019 and in 2010: Macmillan, Tyler & Vignoles, 2015). It therefore remains to be seen whether these labour market barriers persist for today's new labour market entrants when they are mid-career in 20 years' time.

Secondly, it would be valuable to explore whether similar characteristics are likely to explain access gaps to elite occupations for young people starting their careers today. For example, in the analysis boys reported higher graduate job aspirations and were more likely to obtain postgraduate degrees than girls. However, the career aspirations of girls have changed substantially since the 1970s (Sharpe, 2001) and girls are now more likely to obtain undergraduate degrees (there was no undergraduate gender gap in this analysis) and progress onto postgraduate study than boys (HESA (2020) reports that 60% of all postgraduate degrees are now obtained by girls). It may be that other factors such as work experience or psychometric skills have become more important in explaining access gaps as the graduate job market has become more competitive and recruitment practices have evolved over recent decades (see Chapter 4). Further analysis using individual-level job application data from elite employers could provide useful insights into which skills and experiences are rewarded in the recruitment processes for current labour market entrants.

Thirdly, given that the majority of the access gap in elite careers between elite sons and non-elite daughters cannot be explained by the rich characteristics available in the BCS70 data, there is a need for further research to identify which characteristics or experiences of elite sons make them particularly likely to access elite occupations. In addition to extending the illustrative analysis of labour market choice included here, other potential explanatory factors to be considered include unobserved non-cognitive skills⁴⁹, psychometric test scores, measures of networks or work experience closer to labour market entry, cultural capital (such as accents, hobbies or style of dress) and human capital (such as detailed grades), awareness of how to ‘play the game’ (e.g. Bathmaker, Ingram & Waller, 2013) and motivation or proactivity. It is also possible that higher returns to some characteristics for elite males may help explain their labour market success, such as attending an elite university (Britton et al., 2019) or private schooling (Green, Henseke & Vignoles 2017; Green et al., 2018). The possibility of direct bias towards elite males and discrimination against non-elite females also cannot be ruled out such as those relating to gendered perceptions of career commitment (Rivera & Tilcsik, 2016; Coltrane, 2004).

Fourthly, the findings relate only to the intersection of SES and gender in access to elite occupations, split by broad occupational groups. This analysis could be broadened and deepened by considering the intersection of other diversity characteristics with SES and gender (most notably ethnicity); by exploring narrower industry sectors where elite males are particularly favoured, such as financial services (Laurison & Friedman, 2016; FCA, 2019; Bridge Group. 2020b); by exploring wider gaps between high SES males and *low SES* females (rather than only non-elite females); and by extending this analysis to explain retention and progression barriers.

Fifthly, as in Chapter 2, the analysis cannot distinguish between individuals who applied to an elite employer but were rejected (recruiter preferences), and those who never applied to an elite employer (preferences of potential applicants). The relative importance of individual aspirations versus barriers in recruitment processes therefore remains unclear, although the findings on graduate job aspirations do show that aspirations are likely to be part of the issue (as elite sons have the highest level of professional aspirations at age 16).

⁴⁹ Such as self-confidence which has been shown to partly explain gender gaps in elite occupational status at age 42 (Adamecz-Völgyi & Shure 2022) and in salaries for STEM graduates (Sterling, Thompson and Wang 2020). The tendency to overclaim knowledge is also highest for males and high SES individuals (Jerrim, Parker & Shure, 2019), and women have lower preferences for risk and competition (Azmat & Petrongolo, 2014).

Further research using elite employer recruitment data (such as the dataset used in Chapter 4) would allow these issues to be untangled and shed light on whether applicant pools to elite organisations are nationally representative (capturing preferences and aspirations) and whether they become less representative throughout the recruitment process (capturing barriers). This is particularly relevant for exploring the remaining unexplained advantage for elite sons when accessing STEM professions which may be driven by differences in industry preferences between elite sons and non-elite daughters developed from an early age, even amongst those who aspire to a professional career in general. For example, it has been shown that females from lower SES background are less likely to choose STEM A-levels (Codioli, 2017), a factor which is not controlled for this in analysis. This indicates a potentially important role for preferences and socialisation, in addition to concerns about recruiter bias, in explaining the advantage of elite sons over non-elite daughters in accessing elite careers, especially those in STEM professions.

Chapter 4

The Role of Social Capital in Elite Graduate Recruitment

Claire Tyler

Chapter 4 has been redacted for reasons of commercial sensitivity.

5. Summary and Conclusions

5.1 Summary of findings

This thesis has examined socio-economic inequalities in access to elite occupations in the UK. Despite this issue being an ongoing focus of UK government social mobility policy, persistent socio-economic inequalities remain in access to these careers. The four papers contained within this thesis have each provided new evidence on possible causes of these inequalities with a particular focus on extending the analysis beyond inequalities in educational attainment.

Chapter 1 explored the role of family background and use of networks in early access to elite occupations, using DLHE data. This provides new evidence that higher SES graduates are more likely to enter elite occupations in the first 3.5 years of their career than their less advantaged peers largely due to differences in educational attainment and university selection. In particular, privately educated graduates are a third (9.5ppt) more likely to enter into high-status occupations than state educated graduates from similarly affluent families and neighbourhoods (28.1% chance). However even accounting for differences in educational experiences, an unexplained private school advantage remains. This suggests that private schooling may provide additional benefits over and above educational attainment (such as cultural capital or non-cognitive skills); employers may favour private school applicants over state school applicants in their recruitment processes, and/or privately educated graduates may be more likely to choose to pursue elite careers than state educated graduates. In each case, private school graduates become disproportionately represented in the workforce of elite organisations. A key contribution of this paper is to show that the use of networks to find out about job opportunities is predictive of access to elite occupations. A further contribution is the finding that although high SES graduates are more likely to report using personal and professional networks than their low SES peers, this difference in the usage of networks does *not* explain the remaining advantage observed for privately educated graduates in the elite labour market over similarly academically qualified state-school graduates. Since these findings were published (as Macmillan, Tyler & Vignoles, 2015) these conclusions about the role of networks in social mobility have been supported elsewhere using different datasets (Marcenaro-Gutierrez, Micklewright & Vignoles, 2015; Gugushvilli, Bukodi & Goldthorpe, 2017; Green et al., 2018).

Chapter 2 explored the role of cognitive and non-cognitive skills in creating barriers to elite occupations for individuals from less advantaged backgrounds, using data from the 1970 British Cohort Study (BCS). Creating a new measure of accessing an elite occupation at any point in the first half of an individual's career, the results show that children from elite families are twice as likely to 'ever' enter an elite occupation in adulthood than their less advantaged peers. Almost two-fifths of this SES access gap can be explained by SES gaps in childhood cognitive and non-cognitive skills, highlighting the early origins of occupational trajectories. Specifically, the results suggest a role for self-perception (locus of control), self-control and regulation (application and lower externalising behaviour), social skills and cognitive ability in maths, reading and language comprehension in transmitting elite occupational advantage between generations. The results show that half of the effect (one-fifth of the SES gap) relates not only to skills predicting educational attainment at school and university (including access to Russell Group universities and obtaining a 'good' degree), but also to predicting early signs of career self-management in teenage years (including professional aspirations, challenge seeking values and commercial awareness). The paper therefore highlights career self-management as an additional route by which having higher levels of cognitive and non-cognitive skills appears to help children from elite families replicate the occupational advantage of their parents. The remaining half of the effect (a further fifth of the SES gap) relates to childhood skills directly predicting access to elite careers in adulthood, even over and above educational attainment. Methodologically it also demonstrates the value of analysing access to elite occupations over multiple waves of survey data rather than relying on a single mid-career snapshot which is common in related literature but underestimates levels of access to elite occupations as it conflates issues of access (whether individuals enter these careers) and retention (whether they remain in these careers).

Chapter 3 explored how SES and gender intersect to influence access to elite occupations. The paper provides new evidence that sons from elite backgrounds benefit from a large 'triple advantage' over daughters from non-elite backgrounds when accessing elite occupations over the first half of their career, reflecting not only advantages related to SES and gender in isolation, but also an additional advantage experienced only by elite sons. This additional intersection effect accounts for almost a quarter (23%) of the raw access gap in elite occupations overall between sons from elite backgrounds and daughters from non-elite backgrounds and 40% in STEM professions. The results show

that a portfolio of educational and non-educational advantages drives the high access rates of elite sons relative to non-elite daughters, for example higher levels of maths ability, GCSE attainment and professional aspirations appear particularly important in explaining the gap in elite occupational outcomes. However, the results also highlight additional interaction effects between SES and gender relating to professional aspirations, private schooling, attainment at GCSE, undergraduate degrees in STEM subjects and postgraduate degrees. This means that elite sons have higher levels of these attributes than we would expect given the SES and gender gaps in these attributes observed in their peers, which additionally contributes to their success in the elite labour market. Even accounting for the full portfolio of observed advantages, 50% of the access gap between elite sons and non-elite daughters in access to managerial occupations remains unexplained, rising to 67% unexplained in STEM professions. Illustrative analysis suggests that labour market choices around part-time working and caring responsibilities could potentially be important barriers to elite occupations and may explain some of these remaining access gaps between sons from elite backgrounds and daughters from non-elite backgrounds.

Chapter 4 explored the role of social capital in graduate recruitment in one elite sector, the UK professional services industry, using newly available applicant data from a large graduate employer. The results provide the first quantitative evidence that graduates with greater social capital (as indicated by the influence of personal and professional networks, including work experience) are found to be more successful in the formalised recruitment processes of PSFs than their otherwise similar peers who rely on online resources for careers guidance (this is consistent with findings from Chapter 1 showing the importance of networks). This is particularly apparent in situational judgement tests and face-to-face assessments, where professional judgement and cultural 'fit' are crucial attributes of aspiring employees, both of which may be developed through prior exposure to networks of professionals. This supports the hypothesis that, although personal and professional networks are unlikely to be a direct route to employment in large PSFs due to formalised recruitment processes, they may provide other more subtle advantages to applicants. The paper further reveals disadvantages for less privileged applicants (who are eligible for free school meals or are first in their family to obtain a degree) who rely on their relatives for careers guidance. The guidance received by these applicants appears to be more aspirational than value added, potentially being no more valuable than using online career resources. These results therefore show that although the usage of networks varies by SES, this is only a small part of the role networks play in social mobility (consistent with

findings in Chapter 1 and elsewhere in Marcenaro-Gutierrez, Micklewright & Vignoles, 2015; Gugushvilli, Bukodi & Goldthorpe, 2017; Green et al., 2018). This paper contributes to this debate by demonstrating that a measure of the quality or relevance of the network to professional careers is also required in this type of research to show how the same type of network (such as a relative) can potentially be more valuable for higher SES applicants than for lower SES applicants. Access to *relevant* networks therefore seems to be an important predictor of obtaining a job offer in PSFs.

As a baseline position, this thesis therefore adds to the well-established evidence that SES inequalities in educational attainment are an important driver of SES inequalities in access to elite occupations (particularly seen in Chapters 1-3). Beyond this, the main contribution of the thesis is to provide new evidence on the role of other factors which may explain the barriers faced by individuals from less advantaged backgrounds when accessing elite occupations, over and above educational attainment. The evidence presented shows that these factors include access to private schooling; social capital in the form of networks and work experience; non-cognitive skills in childhood, career self-management such as aspirations, use of multiple networks and commercial awareness; the intersectionality of SES and gender; labour market choices around part time work and full-time parental responsibilities; and the choice of elite occupational type (such as managerial or professional) or industry.

5.2 Implications for policy makers and employers

As an individual's socio-economic background continues to predict their chances of accessing an elite occupation the findings from this thesis have several implications for social mobility policy in the UK.

Firstly, the primary recommendation arising from the findings is that elite employers should be encouraged to capture and analyse the social background data of all applicants (successful and unsuccessful), in addition to existing data on other protected characteristics, such as gender and ethnicity. This will enable elite employers to identify and act upon potential bias in recruitment processes. It will highlight if they are attracting a diverse pool of applicants; if they are 'losing' socio-economic diversity throughout the process and at which stage this is occurring (such as psychometric testing, academic screening or assessment centres). Despite social background data collection already being promoted by the Social Mobility Commission (such as SMC (2021a)), 65% of the firms who submitted an entry to the 2021 Social Mobility Employer Index do not currently

collect this data, despite this being a sample of 203 proactive firms who are already leading and/or interested in improving SES diversity (SMF, 2021, pp13). As shown in this thesis, socio-economic barriers to elite careers exist for individuals based on the occupation of their parents (Chapters 1-3), school type (Chapter 1-4), whether they received free school meals (Chapter 4) and whether they have a graduate parent (Chapter 4). There is therefore a clear need for the causes of these disadvantages to be identified by following the SMC guidance of collecting data on these four SES metrics. This employer data also has the potential to form an important evidence base to directly inform social mobility policy. The longitudinal data sets commonly used in related research capture individuals' social origins and occupational outcomes, but do not capture if individuals apply for elite careers but fail to receive a job offer, nor do they reveal an individual's chances of receiving a job offer relative to their peers. The use of employer data to inform social mobility policy therefore allows potential employer bias in recruitment processes to be untangled from SES differences in individual aspirations and career choices.

Secondly, a further advantage of SES data collection is the ability of elite employers to assess whether intersectionality is a concern in their organisation. The data would allow employers to monitor gaps in the chances of receiving job offers between individuals with multiple advantages or disadvantages, identify the causes of these gaps and take action to reduce these barriers. This thesis (Chapter 3) specifically explores the intersection of SES and gender to show a large 'elite male advantage' in access to elite occupations, but this approach can apply to any other combination of diversity characteristics. Even without available data to monitor, it would be valuable to increase awareness among elite recruiters that SES and gender intersect not only in educational attainment at school, but also in many other areas such as graduate job aspirations, private school attendance, degree subject choice and postgraduate study to favour males from elite backgrounds and penalise females from non-elite backgrounds *even more* than the separate SES and gender gaps in these characteristics would predict. The stronger the intersection of SES and gender in an industry (such as STEM), the less likely it is that treating SES and gender barriers in isolation will eliminate the access gaps between elite males and non-elite females. Even in cases where SES and gender do not intersect, employers should be aware that females from non-elite backgrounds can still face a 'double disadvantage' from their SES and gender characteristics, such as in maths and language comprehension, self-esteem, promotion aspirations and preferences around working patterns. Employers who therefore wish to be inclusive and meritocratic, but who appear to favour elite males,

could review their recruitment and promotion processes and consider whether there is any evidence of bias.

Thirdly, given the role of childhood cognitive and non-cognitive skills in transmitting occupational advantage between generations (Chapter 2), the findings suggest that policy interventions to reduce SES gaps in seven specific childhood skills - self-perception (locus of control), self-control and regulation (application and lower externalising behaviour), social skills and cognitive ability in maths, reading and language comprehension - could help reduce inequalities in access to elite occupations, via their effects not only on educational attainment, but also career self-management (aspirations, use of multiple networks and commercial awareness) and occupational outcomes directly. Recruiters should therefore be aware that screening methods which assess cognitive and non-cognitive skills may inadvertently favour applicants from more advantaged backgrounds. Widening the scope of contextual recruitment practices to include all recruitment criteria and tests (not only academic performance which is often the focus, such as contextualising degree class or using university blind recruitment) may therefore have benefits for social mobility.

Fourthly, the findings support policies to either reduce or accommodate SES gaps in ‘career self-management’ attributes. These attributes, such as aspirations, use of networks, work experience and commercial awareness, feature in different ways in each of the four papers within this thesis and are consistently predictors of access to elite occupations, over and above educational attainment. For example, exposure to the world of work appears influential in driving access to elite occupations⁵⁰, as does having professional aspirations (Chapters 2 and 3), using multiple networks (Chapter 3) and accessing *relevant* networks (Chapter 4). Policies to reduce SES gaps in these attributes may include ensuring fair access to work experience opportunities through advertised positions, transparent hiring processes and offering paid rather than unpaid internships. They may also include providers of careers guidance in schools and universities facilitating exposure to networks of professionals to build students’ awareness of career options, raise professional aspirations and provide role models who demonstrate professional behaviours. Policies which acknowledge the challenges in reducing SES gaps in these career self-management attributes and accommodate them where possible

⁵⁰ Chapter 1: ‘finding out about a job due to previously working at the firm’ is related to access to higher managerial jobs; Chapter 2: commercial awareness is related to access to elite occupations, Chapter 4 ‘being influenced by work experience at the firm’ is related to higher chances of passing each stage of the recruitment process.

may also aid social mobility. For example, employers may adjust their recruitment processes to remove criteria or assessments which favour applicants with work experience or access to networks. A recent example of this is Severn Trent who removed commercial awareness and business affinity from their recruitment criteria to create a more level playing field for lower SES applicants (SMF, 2021). Graduate recruiters may also wish to consider widening contextual recruitment beyond academic credentials to reflect SES gradients in access to networks and work experience. A current example of this is elite employers in the legal sector who use the Rare Recruitment Contextual Recruitment system which allows employers to view an applicant's academic record, extra-curricular achievements and work experience in the context of their individual socio-economic circumstances (SMF, 2021).

Fifthly, although the primary focus of this thesis is exploring drivers of SES inequalities in access to elite occupations beyond educational attainment, the analysis (Chapters 1-3 in particular) nonetheless clearly contributes to the body of existing evidence which relates educational inequalities to occupational inequalities. The findings therefore support policies aiming to close SES gaps in educational outcomes for young people in order to narrow SES gaps in occupational outcomes.

Lastly, given the clear socio-economic barriers which remain in access to elite occupations (even when young people have comparable levels of educational attainment) which have been demonstrated across all four papers in this thesis, the findings would also support calls for socio-economic background to become a protected characteristic in UK law alongside other characteristics such as gender and ethnicity (SMC 2021b). This is usefully illustrated by the findings in Chapter 3 which show that females from non-elite backgrounds do not simply face an 8.3ppt gender gap (the sample mean) in access to elite occupations, they face a 34.5ppt gap compared to men from elite backgrounds (57.0% vs 22.5% access rates), meaning the majority of their disadvantage is currently unprotected.

5.3 Avenues for future research

Several avenues of future research arise from the findings in this thesis.

This thesis has shown that social background remains a predictor of access to elite occupations even after accounting for differences in educational attainment and a range of other 'non-educational' attributes. Future research is therefore required to understand why this is the case as it currently remains unclear whether the unexplained SES barriers reflect employer discrimination based on social background or whether they capture

omitted meritocratic factors. This would involve identifying additional factors which vary by SES and are also favoured by elite employers. This may include attributes which are seen as a reflection of ‘talent’, such as persuasiveness, confidence, drive and ‘polish’ (Ashley et al., 2015; Sutton Trust, 2014; Exley, 2019) or other skills which are directly assessed by employers (such as situational judgement or critical thinking). Analysis of other measures of career self-management, such as the use of multiple networks and access to internships, close to labour market entry would also be informative due to the widely acknowledged importance of work experience and ‘playing the game’ during university years (Bathmaker, Ingram & Waller, 2013; Roberts, 2017; Total Jobs & SMF, 2021; Wright & Mulvey, 2021) for access to elite occupations. Further research is therefore needed to establish which alternative factors are most important.

In practical terms, a productive avenue for future research in this field is likely to be the use of individual-level socio-economic background data collected by elite employers from successful and unsuccessful applicants to identify recruitment barriers to elite organisations. This is the subject of a new ‘Access to the Professions’ research project, funded by the Nuffield Foundation, to which the work in this thesis has contributed⁵¹. This will shed light on whether applicant pools to elite organisations are nationally representative (capturing SES gaps in aspirations) and whether they become less representative throughout the recruitment process (capturing potential recruiter bias). This research can compare applicants on a ‘like for like’ basis by observing whether SES predicts the chances of being recruited, even when applicants are comparable on other educational and demographic measures and recruitment test scores. It can also reveal which types of recruitment methods, such as academic screening, psychometric tests, or assessment centres create the largest barriers for underrepresented groups, thereby informing employers ‘what works’ for improving social mobility. The analysis also allows the results for each employer to be anonymously benchmarked to their industry peers to drive overall progress on socio-economic diversity in the elite labour market. Future work could also usefully extend this analysis of employer data to explain socio-economic barriers to progression and retention. This would require analysis of individual-level workforce data obtained from employers including salaries, performance ratings, promotions and terminations. This could reveal, for example, if pay or promotions are predicted by SES even where employees obtain the same performance ratings and work in a similar role.

⁵¹ <https://www.nuffieldfoundation.org/project/inequalities-in-access-to-elite-occupations>

Further research is also required on the role of networks and work experience in access to elite occupations, however appropriate datasets can be difficult to obtain to explore these issues in more detail. Given the evidence presented in this thesis on the potential role of using multiple networks (Chapter 2) and having access to relevant networks (Chapter 4), further research is required respectively to replicate these findings for a current cohort of graduates (to update evidence since the BCS70 cohort) and on a larger scale across multiple employers (to extend the evidence beyond one professional services firm). In addition, further work is required to explore SES barriers to work experience which is key recruitment channel in elite organisations and may exhibit similar, if not greater, barriers to entry level roles as paid internships can often be more competitive than graduate positions. The role of networks and work experience in entry-level roles will be incorporated into the ‘Access to the Professions’ project using employer data to explore these issues.

It would also be informative to update the evidence on the role of non-cognitive skills in access to elite occupations for young people entering the workforce today. The evidence in this thesis relates to the BCS70 cohort and how non-cognitive skills influence access to elite occupations over the first half of their career (Chapter 2). It is possible that the ongoing growth in the number of graduates, coupled with an increasing emphasis on graduate employability to remain competitive, may have increased the importance of non-academic attributes relative to academic attainment (Ashley et al., 2015). It is therefore likely that the contributions of non-cognitive skills, especially those tested by psychometric tests and assessment centres, as well as other attributes such as aspirations, networks, work experience and commercial awareness to explaining SES gaps in access to elite professions may have increased over time.

The findings in this thesis also highlight the need for more empirical evidence on the role of the intersection of SES and gender on access to elite occupations. The majority of the advantage of males from elite backgrounds over females from non-elite backgrounds (explored in Chapter 3) remains unexplained by a range of educational and non-educational factors. Future work could explore which other factors may be driving this and whether it relates to career preferences or recruiter bias. The potential role of flexible working patterns (such as working part-time) and periods out of the labour market in explaining differential access to elite occupations should also be considered further.

6.0. Appendix – Introduction

Testimonials from existing participants in the ‘Access to the Professions’ project:

Firm 1

“We have been working with the Access to the Professions study since 2017 which is supporting our aims to improve access to the professions for candidates from lower socio-economic backgrounds. We have been able to feed into and shape the analysis, including designing a bespoke annual report for us and including other focus areas around Inclusion, Diversity and Social Equality (IDSE). The analysis shared provides detailed information on our programmes and recruitment process, and the effects across social mobility and wider IDSE characteristics. This longitudinal lens is allowing us to monitor impact over time, highlighting potential focus areas for improvement and further monitoring, as well as helping to inform strategic direction.

The methodology used is robust, and the team have also supported us in how this can be communicated effectively across stakeholders. The team are clearly passionate about making a difference and supporting firms to understand and utilise their data in order to make data led decisions, including annual discussions around their findings and next steps which have been very insightful.”

Firm 2

“We have been involved in the Access to the Professions project for a number of years. Early on we received guidance on the measures of socio-economic background we should be using and the questions we should be asking applicants and hires. We have submitted data on our student applicants and hires across a number of intake years and have received a report and feedback on how students from different backgrounds perform at different stages in our recruitment process.

The Access to the Professions team have been fantastic to work with, extremely helpful, knowledgeable, and professional, providing massively valuable outputs. The research is

extremely helpful for us when setting our social mobility strategy including the actions we take around attraction and selection of student hires. We have recently implemented a new recruitment process and the Access to the Professions team are reviewing data from the new process to produce a comparison between this and the previous process in terms of success of applicants from different backgrounds. This will be very helpful for us when looking at the impact the new recruitment process has had and any further changes we might need to make. We would recommend for other employers to get involved with the research as it has been and continues to be of huge value to us in setting our social mobility strategy and ultimately improving access to our firm.”

6.1. Appendix – Chapter 1

Table A1.1: Occupations within professional groupings:

Table A1.2: Differences in the social origins of those in the early HESA sample and those in the later longitudinal sample

Table A1.3: Social origins of those entering the top professions

Table A1.4: Marginal effects of family background on having a high status (NS-SEC 1) occupation 3.5 years after graduation by gender

Table A1.1: Occupations within professional groupings:

Occupational group	Occupation examples
Business	Accountants, economists, statisticians, brokers, underwriters, tax specialists
Medical	Doctors, dentists, pharmacists, psychologists, veterinarians
Law	Judges, barristers, solicitors
Education	Higher education teachers and researchers, secondary and primary head teachers, senior administrators
Built environment	Engineers, IT consultants, architects, surveyors.
Scientists	Chemists, biologists, physicists, astronomers, mathematicians
Other	Clergy, probation officers, aircraft pilots

Table A1.2: Differences in the social origins of those in the early HESA sample and those in the later longitudinal sample

	Longitudinal sample	Early sample only
Parents' NS-SEC		
Professional	13.1	12.3
Lower manager	16.3	16.3
Intermediate	7.9	7.7
Small employer	3.8	3.7
Supervisor	2.4	2.6
Semi-routine	5.3	5.8
Routine	2.4	2.6
Unemployed	0.1	0.1
SEC missing	48.8	49.0
Low participation	7.7	8.7
2nd quintile part.	12.6	13.3
3rd quintile part.	18.1	18.4
4th quintile part.	23.1	22.7
High participation	31.8	30.8
Low participation missing	6.6	6.2
State school	60.2	59.6
Private school	6.4	6.6
School type missing	33.4	33.7

Notes: Percentages based on the entire sample of respondents before additional restrictions applied including aged eighteen to twenty-five, must be an undergraduate leaver in 2006/7 and must have a 5-digit SOC 2000 code at 3.5 years

Table A1.3: Social origins of those entering the top professions

NS-SEC	1 Top NS-SEC job	1.1 Higher managerial	1.2 Business, medical and law	1.2 Other professions	2-7 Other graduate jobs
<i>Parents' NS-SEC</i>					
Professional	25.2	23.2	27.2	24.6	20.7
Lower manager	25.6	28.9	23.3	25.9	26.2
Intermediate	11.3	12.5	11.3	10.7	12.5
Small employer	5.6	5.9	5.2	5.8	6.4
Supervisor	3.6	3.4	3.0	4.3	4.0
Semi-routine	6.7	6.4	5.5	7.8	7.7
Routine	3.1	2.7	2.8	3.6	3.8
Unemployed	0.0	0.1	0.0	0.0	0.1
SEC missing	18.8	17.0	21.7	17.3	18.8
Low participation	5.9	6.3	5.0	6.4	7.8
2nd Q. part.	10.5	10.7	9.2	11.5	12.9
3rd Q. part.	16.2	15.3	16.1	16.6	18.0
4 th Q. part.	23.2	24.3	22.0	23.7	24.1
High participation	38.9	38.0	41.8	37.1	33.6
Low part. miss.	5.3	5.5	5.8	4.8	3.6
State school	72.4	69.1	68.5	76.9	78.5
Private school	14.8	17.8	19.3	9.8	9.5
State school miss	12.9	13.1	12.2	13.3	12.1

Notes: Percentages based on our final sample once additional restrictions applied including aged eighteen to twenty-five, must be an undergraduate leaver in 2006/7 and must have a 5-digit SOC 2000 code at 3.5 years.

Table A1.4: Marginal effects of family background on having a high status (NS-SEC 1) occupation 3.5 years after graduation by gender

	Males	Females
Professional	-0.029(0.027)	0.017(0.030)
Lower manager	-0.026(0.027)	0.009(0.028)
Intermediate	-0.041(0.030)	-0.005(0.031)
Small employer	-0.038(0.031)	-0.008(0.032)
Supervisor	-0.030(0.035)	0.007(0.034)
Semi-routine	-0.017(0.031)	-0.008(0.031)
Routine	Baseline	Baseline
Unemployed	-0.327(0.001)	0.074(0.086)
Low part.	-0.037(0.024)	0.012(0.020)
2nd quintile part.	-0.029(0.019)	0.012(0.017)
3rd quintile part.	Baseline	Baseline
4th quintile part.	-0.030(0.017)*	0.033(0.014)**
High part.	-0.004(0.014)	0.033(0.012)***
State school	-0.016(0.025)	-0.029(0.011)***
Controls		
Demographics	x	x
Prior attainment	x	x
Institution	x	x
Post-grad qual.	x	x
<i>N</i>	10,664	14,316
Pseudo R-squared	0.148	0.194

Demographics: Gender, age, ethnicity. Prior attainment: UCAS tariff, subject, attainment. Institution: Institution fixed effects, region of institution. Post-grad: Higher research, taught, post-grad. certificate/diploma or other at three years. Standard errors are clustered at institution level. *90% confidence, **95% confidence, ***99% confidence. The Z-score from testing the difference between the two state school coefficients is 0.48.

6.2. Appendix – Chapter 2

Table A2.1: Descriptive statistics for the estimation sample and BCS70 population

Table A2.2: Correlation matrix of non-cognitive and cognitive skills at age 10 for the estimation sample

A2.3: Creation of childhood cognitive and non-cognitive skill variables

Table A2.4: SES disparities in childhood skills (Stage 1)

Table A2.5: Which childhood skills predict access to elite occupations? (Stage 2)

Table A2.6: SES disparities in measures of career self-management (age 16) and education (age 16+) (Stage 1)

Table A2.7: Decomposition of the SES gap in access to elite occupations, by age and 'ever'

Table A2.1: Descriptive statistics for the estimation sample and BCS70 population

	Sample (N=11154)		Population (N=18740)	
	Mean	Std dev	Mean	Std dev
<u>Childhood skills - age 10</u>				
<i>Non-cognitive skills</i>				
Self-perception				
- Locus of control	0.07	0.91	0.00	1.00
- Self esteem	0.04	0.91	0.00	1.00
- Academic self concept	0.02	0.91	0.00	1.00
Self-control				
- Externalising behaviour	-0.07	0.92	0.00	1.00
- Application	0.09	0.89	0.00	1.00
Social Skills	0.07	0.94	0.00	1.00
Emotional	-0.03	0.95	0.00	1.00
<i>Cognitive skills</i>				
Reading	0.11	0.86	0.00	1.00
Maths	0.11	0.85	0.00	1.00
British ability scale	0.11	0.85	0.00	1.00
Language comprehension	0.11	0.90	0.00	1.00
Spelling	0.08	0.88	0.00	1.00
<u>Career self-management - age 16</u>				
<i>Aspirations</i>				
High wage	0.95	0.14	0.95	0.22
Promotion	0.89	0.20	0.88	0.32
Challenge	0.85	0.23	0.85	0.36
Security	0.92	0.17	0.92	0.28
Professional	0.36	0.33	0.36	0.48
<i>Networks</i>				
No network	0.02	0.10	0.03	0.16
Education network only	0.07	0.17	0.07	0.26
Personal network only	0.09	0.20	0.10	0.29
Educational and personal networks	0.82	0.27	0.81	0.39
<i>Work experience</i>				
School work experience	0.33	0.33	0.33	0.47
Commercial awareness	0.08	0.55	0.00	1.00
<u>Educational attainment - age 16+</u>				
<i>School type</i>				
Private school	0.06	0.21	0.06	0.25
Grammar school	0.05	0.20	0.05	0.22
Non-selective state school	0.88	0.28	0.88	0.32
<i>Attainment</i>				
Number of GCSEs grade A-C (and equivalents)	3.55	3.23	3.34	3.61
Number of A-levels grade A-C (and equivalents)	0.47	0.90	0.43	1.01
Undergraduate degree	0.18	0.35	0.17	0.37
No degree	0.82	0.35	0.83	0.37
Degree * Russell * 1st, 2:1	0.02	0.14	0.02	0.14
Degree * Russell * 2:2, 3rd, pass	0.02	0.12	0.02	0.13
Degree * Non Russell * 1st, 2:1	0.06	0.21	0.05	0.22
Degree * Non Russell * 2:2, 3rd, pass	0.05	0.20	0.05	0.21
Degree * No Inst. * 1st, 2:1	0.02	0.11	0.01	0.12
Degree * No Inst. * 2:2, 3rd, pass	0.02	0.11	0.02	0.12
Higher degree	0.02	0.13	0.02	0.14

Table A2.1 shows descriptive statistics for the estimation sample (n=11154) and the BCS70 population (n=18740). The scores for non-cognitive skills, cognitive skills and work knowledge have been standardised across the BCS70 population (to a mean of zero and standard deviation of one), allowing a comparison of the characteristics of the estimation sample and the BCS70 population. The figures for all other variables (except GCSEs and A-levels) represent the percentage of individuals within each category.

Overall, the sample characteristics are similar to the BCS70 population characteristics with only small differences in age 10 ability and later educational attainment. Individuals in the estimation sample have slightly higher non-cognitive and cognitive ability at age 10 than the BCS70 population (less than 10% of a standard deviation for non-cognitive skills and around 11% of a standard deviation difference for cognitive skills). This is also reflected in slightly higher educational attainment (and commercial awareness) for the sample than the population. Individuals in the sample possess an average of 3.5 GCSEs at grades A-C (or equivalent) and 0.5 A-levels at grade A-C, compared to 3.3 and 0.4 respectively for the BCS70 population. In the sample 17.9% of individuals hold an undergraduate degree and 2.2% hold a postgraduate degree compared to 16.6% and 2.0% for the population. There are no material differences in type of school attended, career aspirations, use of networks or work experience.

Table A2.2: Correlation matrix of non-cognitive and cognitive skills at age 10 for the estimation sample

	Non-cognitive skills - age 10							Cognitive skills - age 10				
	Locus of control	Self Esteem	Academic self concept	Externalising behaviour	Application	Social skills	Emotional	Reading	Maths	BAS	Language comp.	Spelling
<u>Non-cognitive skills - age 10</u>												
Self-perception												
- Locus of control	1.00											
- Self esteem	0.41	1.00										
- Academic self concept	0.29	0.25	1.00									
Self-control & regulation												
- Externalising behaviour	-0.18	-0.15	-0.09	1.00								
- Application	0.38	0.23	0.26	-0.25	1.00							
Social Skills	0.21	0.21	0.13	-0.25	0.43	1.00						
Emotional	-0.11	-0.13	-0.07	0.43	-0.08	-0.28	1.00					
<u>Cognitive skills - age 10</u>												
Reading	0.48	0.21	0.28	-0.22	0.52	0.21	-0.10	1.00				
Maths	0.46	0.23	0.21	-0.21	0.50	0.21	-0.13	0.72	1.00			
British ability scale	0.40	0.19	0.17	-0.18	0.41	0.16	-0.10	0.61	0.62	1.00		
Language comprehension	0.38	0.18	0.20	-0.17	0.34	0.13	-0.10	0.59	0.55	0.51	1.00	
Spelling	0.37	0.17	0.33	-0.18	0.47	0.19	-0.06	0.64	0.55	0.46	0.36	1.00

A2.3: Creation of childhood cognitive and non-cognitive skill variables

Cognitive skills (age 10)

Cognitive ability in childhood is measured using scores from all five cognitive tests included in the age 10 survey. The ‘Edinburgh Reading Test’ assesses vocabulary, syntax, sequencing, comprehension and retention. The ‘Friendly Maths Test’ assesses arithmetic, number skills, fractions, algebra, geometry and statistics. The British Ability Scale, a proxy for IQ, contains two verbal subscales (word definitions and word similarities) and two non-verbal subscales (digit recall and matrices). The Pictorial Language Comprehension Test assesses the understanding of vocabulary and sentences using groups of pictures. The dictation task measures ability in spelling and phonetic decoding when writing a paragraph dictated by the interviewer. More detail about these tests is available in Parsons (2014).

Non-cognitive skills (age 10)

Each non-cognitive measure outlined below is a composite of several other sub-items. Any missing responses for a sub-item therefore have the potential to bias aggregate scores downwards (as zero points would be awarded for missing responses to sub-items). To avoid this bias, the sub-items have been aggregated as the mean of the non-missing responses, essentially creating an average score per item answered to better reflect the true level of the non-cognitive trait (this approach is not taken for cognitive scores where non-response to a question is penalised as expected in tests).

Self-perception and self-awareness

- *Locus of Control (self-reported)*

Locus of control captures a child’s perception of control over their own achievement and is measured in BCS70 using the CARALOC questionnaire (Gammage, 1975). The CARALOC questionnaire comprises 20 items (of which five are distractors) for which the responses ‘yes’, ‘no’ or ‘don’t know’ are awarded points and aggregated (per Centre for Longitudinal Studies online guidance). The final locus of control measure therefore aggregates 15 items including ‘do you think studying for tests is a waste of time?’ and ‘are you the kind of person who believes that planning ahead makes things turn out better’. A higher score represents a greater internal locus of control, indicating that the child perceives they have a higher level of influence over their own outcomes.

- *Self-esteem (self-reported)*

Self-esteem is captured in BCS70 by the Lawrence Self-Esteem Questionnaire (Lawrence, 1981). This ‘LAWSEQ’ questionnaire contains 16 questions (of which four are distractors) for which the responses ‘yes’, ‘no’ or ‘don’t know’ are awarded points and aggregated per scoring guidance in Lawrence (1981). The final self-esteem measure therefore comprises 12 items including ‘are there lots of things about yourself you would like to change’ and ‘do you think that other children often say nasty things about you?’. A higher score represents greater self-esteem.

- *Academic Self-concept (self-reported)*

The academic self-concept measure captures whether the child considers themselves to do well in a range of six academic school subjects – maths, reading, spelling, creative writing, art and craft, and topics/projects. The binary responses for each of the subject are aggregated such that a higher total score represents a higher level of self confidence in academic ability.

Self-control and regulation

A review of related literature revealed numerous ways of defining and measuring self-control and regulation. Specifically, a range of studies focus on definitions based on conscientiousness (as one personality component of ‘OCEAN’ as per Digman (1990)) or hyperactivity and conduct issues (often measured using the Rutter externalising behaviour metric), or some combination of these two approaches (Layard et al., 2013; Prevo and ter Weel, 2013; O’Reilly et al., 2014; Duckworth & Seligman, 2005; Blanden, Gregg and Macmillan, 2007). However, there is some overlap between conscientiousness and the hyperactive components of externalising behaviour as measured using BCS70 data (such as the ability to be attentive and not be distracted). As such, the analysis in this paper includes a traditional measure of Rutter externalising behaviour and includes an additional measure, termed ‘application’, which contains a range of conscientiousness related characteristics which do not overlap with externalising behaviour.

- *Externalising behaviour (mother-reported)*

An externalising behaviour score for each child is created as a combination of ten conduct and hyperactivity characteristics contained within the mother-reported behaviour questionnaire in BCS70 (each item on a scale of 0-100) and originally outlined by Rutter et al. (1970). The conduct subscale represents anti-social behaviour and captures whether

the child exhibits a tendency to fight, steal, lie, bully, be destructive and be disobedient. The hyperactivity subscale represents behaviour related to motor characteristics, specifically whether the child is restless, is fidgety, twitches or unable to settle to do anything. A high score represents high externalising behaviour representing more severe behavioural issues related to conduct and hyperactivity.

- *Application (teacher-reported)*

An application score for each child is created as a combination of nine characteristics contained within the teacher reported Child Development Behaviour Questionnaire (each item is on a scale of 1-47). This captures the ability of a child to stay ‘on task’ in a classroom setting which is separate from hyperactive behaviour. The components are initially identified from the BCS70 user guides (Butler et al., 1980) which proposes a ‘disorganised activity’ metric of 11 items. This has since been used elsewhere (reverse-coded) as a measure of conscientiousness (O’Reilly et al., 2014; Macmillan, 2013) and, after factoring in 4 further variables, has also been used as a measure of application (Blanden, Gregg and Macmillan, 2007). Six items which overlap with the hyperactive elements of the externalising behaviour measure are then removed (such as the ability to be attentive and not be distracted), leaving the final measure of application to capture whether the child works independently, shows perseverance (if, and how much), accepts the school curriculum, daydreams, becomes bored, is easily confused, is forgetful or is lethargic. Items are coded and combined such that a higher score represents higher levels of application.

Social Skills (teacher- and mother-reported)

A measure of the ability of the child to generate and sustain relationships with their peers is captured as a combination of six items, specifically whether the child is popular with peers, has many friends, shows bold rather than shy behaviour, is cooperative with peers, is not liked and is solitary. These items are graded on a scale of 1-47 (teacher reported), except the latter two which are on a 1-100 scale (mother reported) but are adjusted onto a comparable scale and reverse coded where required such that a high aggregate score represents better social skills.

Emotional behaviour (mother-reported)

Emotional behaviour is measured by aggregating six items from the mother reported child behaviour questionnaire (each on a scale of 0-100), capturing the extent to which the child

is worried, miserable, fearful, fussy, sullen or sulky, or cries for little cause. A high score represents a high level of emotionality.

Table A2.4: SES disparities in childhood skills (Stage 1)

	Mean value		Coefficient on parental occupational status		
	Parent elite occupation (N=1968)	Parent non-elite occupation (N=9186)	Coeff.	Std. Err	Sig.
<u>Childhood skills - age 10</u>					
<i>Non-cognitive skills</i>					
Self-perception					
- Locus of control	0.47	-0.01	0.47	0.02	***
- Self esteem	0.24	0.00	0.25	0.02	***
- Academic self concept	0.18	-0.01	0.18	0.02	***
Self-control					
- Externalising behaviour	-0.30	-0.02	-0.28	0.02	***
- Application	0.39	0.03	0.36	0.02	***
Social Skills					
	0.21	0.04	0.16	0.02	***
Emotional					
	-0.16	0.00	-0.16	0.02	***
<i>Cognitive skills</i>					
Reading	0.60	0.01	0.59	0.02	***
Maths	0.58	0.02	0.56	0.02	***
British ability scale	0.53	0.02	0.51	0.02	***
Language comprehension	0.56	0.01	0.54	0.02	***
Spelling	0.39	0.01	0.37	0.02	***

*** 99% confidence ** 95% confidence * 90% confidence

This table shows the mean value of childhood skills for children from elite and non-elite backgrounds. The difference between these two groups is given in the third column. Children from elite backgrounds have higher cognitive ability (ranging from 0.4-0.6 of a standard deviation on all five measures) and greater self-perception (locus of control, self-esteem, academic self-concept), greater self-control (application skills and less externalising behaviour), better social skills and are less likely to demonstrate emotional behaviour than children from non-elite backgrounds (differences in these non-cognitive scores range from 0.2-0.5 standard deviations).

Table A2.5: Which childhood skills predict access to elite occupations? (Stage 2)

	Model 1			Model 2			Model 3		
	Mfx.	Std Err.	Sig.	Mfx.	Std Err.	Sig.	Mfx.	Std Err.	Sig.
<u>Childhood skills - age 10</u>									
<i>Non-cognitive skills</i>									
Self-perception									
- Locus of control	0.024	0.006	***	0.020	0.006	***	0.011	0.006	*
- Self esteem	0.003	0.006		0.002	0.006		0.001	0.006	
- Academic self concept	0.008	0.005		0.007	0.005		0.005	0.006	
Self-control									
- Externalising behaviour	-0.019	0.006	***	-0.016	0.006	***	-0.009	0.006	
- Application	0.030	0.007	***	0.022	0.007	***	0.014	0.007	**
Social Skills	0.011	0.006	**	0.015	0.006	***	0.018	0.006	***
Emotional	-0.002	0.005		-0.004	0.005		-0.006	0.006	
<i>Cognitive skills</i>									
Reading	0.025	0.009	***	0.018	0.009	**	0.010	0.009	
Maths	0.055	0.008	***	0.047	0.008	***	0.035	0.009	***
British ability scale	0.008	0.007		0.005	0.007		0.000	0.007	
Language comprehension	0.028	0.006	***	0.022	0.006	***	0.013	0.006	**
Spelling	-0.005	0.007		-0.002	0.007		-0.006	0.007	
<u>Career self-management - age 16</u>									
<i>Aspirations</i>									
High wage				0.054	0.033		0.053	0.033	
Promotion				0.038	0.024		0.038	0.024	
Challenge				0.081	0.021	***	0.062	0.021	***
Security				0.056	0.028	**	0.052	0.028	*
Professional				0.134	0.013	***	0.060	0.014	***
<i>Networks</i>									
No network				-0.020	0.058		-0.028	0.058	
Personal network only				0.066	0.034	**	0.074	0.034	**
Educational and personal networks				0.070	0.027	***	0.065	0.027	**
<i>Work experience</i>									
School work experience				-0.012	0.014		0.001	0.014	
Commercial awareness				0.036	0.009	***	0.025	0.009	***
<u>Education - age 16+</u>									
<i>School type</i>									
Private school							0.062	0.022	***
Grammar school							0.023	0.022	
<i>Attainment</i>									
Number of GCSEs grade A-C (and eqs)							0.013	0.002	***
Number of A-levels grade A-C (and eqs)							0.011	0.007	
Degree * Russell * 1st, 2:1							0.172	0.038	***
Degree * Russell * 2:2, 3rd, pass							0.120	0.038	***
Degree * Non Russell * 1st, 2:1							0.132	0.023	***
Degree * Non Russell * 2:2, 3rd, pass							0.113	0.023	***
Degree * No Inst. * 1st, 2:1							0.242	0.040	***
Degree * No Inst. * 2:2, 3rd, pass							0.169	0.039	***
Higher degree							0.061	0.035	*
N	11154			11154			11154		
Pseudo R. Sq.	0.120			0.136			0.173		

*** 99% confidence ** 95% confidence * 90% confidence

Controls included for parental occupational status, gender, ethnicity, UK region of origin, non-UK, mother's and father's age at birth, number of survey waves present.

This table firstly shows associations between childhood skills (at age 10) and accessing an elite occupation in adulthood (age 26 to 42) (Model 1). By age 10, seven childhood attributes are already predictive of elite occupational outcomes. For non-cognitive skills,

each extra standard deviation in locus of control, application and social skill is associated with a higher chance of entering an elite occupation of 2.4ppt, 3.0ppt and 1.1ppt respectively. Each extra standard deviation in externalising behaviour is also associated with 1.9ppt lower chances of entering elite occupation. Similarly, for cognitive ability, there are advantages for reading ability (2.5ppt), maths ability (5.5ppt) and language comprehension (2.8ppt). As 30.2% of children enter an elite occupation at least once in adulthood, these are modest effects for each individual attribute. However, as each measure captures a different facet of childhood personality or ability the combined effects can collectively drive significant disparities in access to elite occupations between children who possess or lack the necessary portfolio of attributes.

Model 2 and Model 3 show that the association between childhood skills and access to elite occupations reduces as measures of career self-management and education are included. These are therefore two important routes by which higher childhood skills enable greater access to elite occupations. In Model 3, five of the seven key childhood skills remain significant predictors of access to elite occupations. The exceptions are externalising behaviour and reading ability which become non-significant with the inclusion of education controls (particularly GCSE performance).

Table A2.6: SES disparities in measures of career self-management (age 16) and education (age 16+) (Stage 1)

	Mean value		Coefficient on parental occupational status		
	Parent elite occupation	Parent non-elite occupation	Coeff.	Std. Err	Sig.
<u>Career self-management - age 16</u>					
<i>Aspirations</i>					
High wage	0.95	0.95	0.00	0.00	
Promotion	0.93	0.88	0.05	0.01	***
Challenge	0.89	0.84	0.05	0.01	***
Security	0.95	0.91	0.04	0.00	***
Professional	0.53	0.32	0.21	0.01	***
<i>Networks</i>					
No network	0.02	0.02	-0.01	0.00	**
Education network only	0.04	0.08	-0.04	0.00	***
Personal network only	0.08	0.09	-0.01	0.00	***
Educational and personal networks	0.87	0.81	0.06	0.01	***
<i>Work experience</i>					
School work experience	0.27	0.35	-0.08	0.01	***
Commercial awareness	0.35	0.01	0.34	0.01	***
<u>Education - age 16+</u>					
<i>School type</i>					
Private school	0.17	0.04	0.14	0.01	***
Grammar school	0.09	0.05	0.04	0.00	***
Non-selective state school	0.74	0.92	-0.18	0.01	***
<i>Attainment</i>					
Number of GCSEs grade A-C (and equivalents)	5.91	3.05	2.86	0.08	***
Number of A-levels grade A-C (and equivalents)	1.11	0.34	0.77	0.02	***
Undergraduate degree	0.41	0.13	0.28	0.01	***
No degree	0.59	0.87	-0.28	0.01	***
Degree * Russell group	0.11	0.03	0.09	0.00	***
Degree * Non Russell group	0.22	0.08	0.14	0.01	***
Degree * No Institution	0.07	0.02	0.05	0.00	***
Degree * Russell * 1st, 2:1	0.07	0.01	0.05	0.00	***
Degree * Russell * 2:2, 3rd, pass	0.05	0.01	0.03	0.00	***
Degree * Non Russell * 1st, 2:1	0.12	0.04	0.08	0.01	***
Degree * Non Russell * 2:2, 3rd, pass	0.10	0.04	0.06	0.00	***
Degree * No Inst. * 1st, 2:1	0.03	0.01	0.02	0.00	***
Degree * No Inst. * 2:2, 3rd, pass	0.04	0.01	0.03	0.00	***
Higher degree	0.05	0.01	0.04	0.00	***

*** 99% confidence ** 95% confidence * 90% confidence

This table shows the mean value of career self-management and education measures for children from elite and non-elite backgrounds. The difference between these two groups is given in the third column. For example, children from elite backgrounds are 21ppts

more likely to report professional aspirations than children from non-elite backgrounds (53% versus 32%). Similarly, the SES difference in commercial awareness at age 16 is one third of a standard deviation (0.34).

Table A2.7: Decomposition of the SES gap in access to elite occupations, by age and ‘ever’

	Measurement point for occupational status					
	Age 26	Age 30	Age 34	Age 38	Age 42	Ever (main results)
Proportion of individuals entering an elite occupation with:						
- an elite parent	29.8%	33.0%	29.3%	30.5%	31.2%	49.6%
- a non-elite parent	14.7%	14.8%	13.5%	15.4%	14.8%	26.0%
SES gap in access to elite occupations (ppts)	15.1	18.1	15.8	15.1	16.4	23.6
SES gap as a ratio	2.0	2.2	2.2	2.0	2.1	1.9
Proportion of SES gap in elite occupations explained by childhood skills:						
<i>Non-cognitive skills</i>						
Self-perception						
- Locus of control	2.7%	6.2% ***	4.5% ***	1.7%	3.7% **	4.5% ***
- Self esteem	0.6%	0.4%	0.2%	0.7%	0.2%	0.2%
- Academic self concept	-0.7%	0.6%	0.6%	0.9%	1.0% *	0.6%
Self-control						
- Externalising behaviour	2.6% **	0.6%	2.2% **	2.1% **	2.0% **	2.1% ***
- Application	6.3% ***	3.6% ***	1.7%	2.4% **	3.6% ***	4.3% ***
Social Skills						
Emotional	0.1%	0.7%	0.3%	-0.2%	0.1%	0.1%
Total non-cognitive skills	12.4%	12.7%	10.7%	8.6%	11.0%	12.5%
<i>Cognitive skills</i>						
Reading	5.2%	2.9%	6.1% **	7.5% **	6.1% **	5.8% ***
Maths	8.4% ***	16.3% ***	14.8% ***	10.9% ***	12.6% ***	12.1% ***
British ability scale	3.2%	0.6%	3.4%	4.7% **	-0.8%	1.6%
Language comprehension	6.4% ***	5.2% ***	3.1% *	4.6% **	3.6% **	5.9% ***
Spelling	2.0%	-2.3% *	1.0%	0.1%	0.1%	-0.8%
Total cognitive skills	25.2%	22.8%	28.4%	27.8%	21.5%	24.6%
Total childhood skills	37.6%	35.5%	39.2%	36.4%	32.6%	37.2%

Controls for gender, ethnicity, UK region of origin, non-UK, mother's and father's age at birth and number of survey waves present.

This table firstly shows the SES gap in access to elite occupations in each adult BCS70 wave (age 26, 30, 34, 38 and 42), and ‘ever’ being employed in an elite occupation. The table then shows the proportion of these SES gaps which are explained by childhood skills (replicating the Model 1 decomposition for different outcomes, with the same demographic controls). The proportion explained by skills varies by age with no clear trend emerging, although out of the point-in-time measures, childhood skills make the smallest contribution to explaining SES gaps in elite occupational status at age 42 (32.6%). This is largely due to some skills appearing more valuable at earlier career stages (such as locus of control, application and language comprehension). Using age 42 data only would therefore underestimate the role of childhood skills in transmitting elite occupational status from parents to children by one-eighth (32.6% versus 37.2% equates to a 12.4% underestimation).

6.3. Appendix – Chapter 3

Table A3.1: Proportion of sons and daughters in elite and non-elite occupations, by survey wave (age 26-42) and ‘ever’.

Table A3.2: Elite occupations by type

Table A3.3: Mean values of characteristics by four SES x gender groups

Table A3.4: Mean values of characteristics, by SES and by gender

Table A3.5: Marginal effects of SES and gender on access to elite occupations (interacted model)

Table A3.6: Predictors of access to elite occupations

Table A3.7: Predictors of access to elite occupations, split by occupational type

A3.8: The potential role of labour market choices in creating barriers to access to elite occupations

Table A3.1: Proportion of sons and daughters in elite and non-elite occupations, by survey wave (age 26-42) and ‘ever’.

Occupational status	Age of cohort member (Son)					Ever
	26	30	34	38	42	
Elite	634 <i>19.8%</i>	946 <i>20.8%</i>	776 <i>19.7%</i>	832 <i>23.2%</i>	856 <i>21.9%</i>	1944 <i>34.3%</i>
Non-elite	2566 <i>80.2%</i>	3600 <i>79.2%</i>	3169 <i>80.3%</i>	2750 <i>76.8%</i>	3060 <i>78.1%</i>	3728 <i>65.7%</i>
Total	3200	4546	3945	3582	3916	5672

Occupational status	Age of cohort member (Daughter)					Ever
	26	30	34	38	42	
Elite	535 <i>15.9%</i>	596 <i>15.1%</i>	448 <i>13.0%</i>	446 <i>13.1%</i>	514 <i>13.8%</i>	1422 <i>25.9%</i>
Non-elite	2838 <i>84.1%</i>	3344 <i>84.9%</i>	3008 <i>87.0%</i>	2948 <i>86.9%</i>	3218 <i>86.2%</i>	4060 <i>74.1%</i>
Total	3373	3940	3456	3394	3732	5482

Table A3.2: Elite occupations by type

Standard Occupational Classification (SOC) codes are used to split elite occupations into sub-groups as follows:

Managers	CEOs of large or small organisations (such as bank managers, post office managers, managers or proprietors in service industries) or managers within organisations (such as HR managers, marketing/sales managers, production manager).
Professionals:	
STEM	Scientists, engineers, IT/communications professionals, health professionals, veterinarians, architects.
Business & Law	Barristers, solicitors, accountant, actuaries, economists, statisticians, management consultants, business analysts.
Other public service	Higher education teaching staff and researchers, school inspectors, social workers, probation officers, clergy, librarians

Table A3.3: Mean values of characteristics by four SES x gender groups

	Elite sons	Non-elite sons	Elite daughters	Non-elite daughters	Difference (Elite sons - non-elite daughters)	Sig.
<u>Non-cognitive skills – age 10</u>						
Locus of Control	0.454	-0.001	0.476	-0.016	0.471	***
Self esteem	0.316	0.103	0.170	-0.116	0.431	***
Academic self concept	0.154	0.019	0.197	-0.036	0.190	***
Rutter externalising	-0.174	0.134	-0.425	-0.174	0.000	
Application	0.262	-0.132	0.523	0.194	0.067	**
Social skill	0.174	0.032	0.246	0.058	0.116	***
Emotional	-0.163	-0.052	-0.157	0.060	-0.223	***
<u>Cognitive skills – age 10</u>						
Reading	0.544	-0.063	0.657	0.083	0.461	***
Maths	0.648	0.063	0.503	-0.030	0.677	***
British ability scale	0.502	-0.012	0.551	0.047	0.455	***
Language comprehension	0.638	0.075	0.472	-0.050	0.687	***
Spelling	0.258	-0.121	0.516	0.153	0.105	***
<u>Aspirations - age 16</u>						
High wage	0.963	0.965	0.943	0.938	0.025	***
Promotion	0.943	0.888	0.922	0.870	0.073	***
Challenge	0.879	0.843	0.908	0.843	0.036	***
Security	0.950	0.927	0.950	0.903	0.046	***
Professional	0.572	0.340	0.494	0.303	0.269	***
<u>Networks - age 16</u>						
No network	0.029	0.034	0.008	0.016	0.013	***
Education network only	0.048	0.097	0.030	0.061	-0.013	**
Personal network only	0.077	0.100	0.079	0.085	-0.008	
Educational and personal networks	0.846	0.769	0.883	0.838	0.008	
<u>Work experience - age 16</u>						
School work experience	0.218	0.322	0.306	0.372	-0.154	***
Commerical awareness	0.274	-0.059	0.406	0.055	0.218	***
<u>School type - age 16</u>						
Private school	0.204	0.038	0.142	0.036	0.168	***
Grammar school	0.076	0.049	0.097	0.046	0.030	***
State school	0.720	0.913	0.761	0.919	-0.199	***
<u>Educational attainment - age 16+</u>						
No. good GCSEs	5.801	2.801	6.013	3.284	2.517	***
No. good A-levels	1.103	0.325	1.110	0.347	0.756	***
Undergraduate degree	0.412	0.135	0.407	0.125	0.287	***
Degree * Russell* 1st or 2:1	0.067	0.014	0.067	0.015	0.052	***
Degree * Russell* 2:2, 3rd, pass	0.051	0.014	0.042	0.011	0.040	***
Degree * Non-Russell* 1st or 2:1	0.109	0.041	0.131	0.047	0.062	***
Degree * Non-Russell* 2:2, 3rd, pass	0.108	0.040	0.094	0.038	0.070	***
Degree * STEM	0.139	0.048	0.081	0.023	0.116	***
Degree * LEM	0.062	0.017	0.060	0.014	0.048	***
Degree * OSSAH	0.080	0.020	0.158	0.049	0.031	***
Degree * Combined	0.007	0.002	0.007	0.007	0.001	
Higher degree	0.067	0.017	0.039	0.013	0.054	***
<u>Labour market choices</u>						
Full time caring/home ever	0.012	0.016	0.254	0.307	-0.295	***
Part time ever	0.059	0.058	0.527	0.566	-0.507	***
N	999	4673	969	4513		

*** 99% confidence ** 95% confidence * 90% confidence

Final column shows whether the differences in mean characteristics between elite sons and non-elite daughters are statistically significant.

Table A3.4: Mean values of characteristics, by SES and by gender

	By SES				By Gender				
	Elite	Non-elite	SES gap	Sig.	Sons	Daughters	Gender gap	Sig.	Sample
<u>Non-cognitive skills – age 10</u>									
Locus of Control	0.465	-0.009	0.474	***	0.079	0.071	0.008		0.075
Self esteem	0.244	-0.005	0.249	***	0.140	-0.065	0.205	***	0.039
Academic self concept	0.175	-0.008	0.183	***	0.043	0.005	0.037	**	0.024
Rutter externalising	-0.297	-0.017	-0.280	***	0.080	-0.218	0.298	***	-0.067
Application	0.390	0.029	0.362	***	-0.062	0.252	-0.315	***	0.092
Social skill	0.209	0.045	0.164	***	0.057	0.091	-0.034	*	0.074
Emotional	-0.160	0.003	-0.164	***	-0.071	0.022	-0.093	***	-0.026
<u>Cognitive skills – age 10</u>									
Reading	0.600	0.009	0.591	***	0.044	0.185	-0.141	***	0.113
Maths	0.576	0.017	0.559	***	0.166	0.064	0.101	***	0.116
British ability scale	0.526	0.017	0.509	***	0.078	0.136	-0.058	***	0.107
Language comprehension	0.556	0.014	0.542	***	0.174	0.042	0.132	***	0.109
Spelling	0.385	0.014	0.371	***	-0.054	0.217	-0.271	***	0.079
<u>Aspirations - age 16</u>									
High wage	0.953	0.951	0.002		0.964	0.939	0.026	***	0.952
Promotion	0.933	0.879	0.053	***	0.898	0.879	0.019	***	0.889
Challenge	0.893	0.843	0.050	***	0.850	0.855	-0.005		0.852
Security	0.950	0.916	0.034	***	0.931	0.912	0.020	***	0.922
Professional	0.533	0.322	0.212	***	0.380	0.337	0.044	***	0.359
<u>Networks - age 16</u>									
No network	0.018	0.025	-0.007	***	0.033	0.014	0.018	***	0.024
Education network only	0.039	0.079	-0.040	***	0.089	0.055	0.033	***	0.072
Personal network only	0.078	0.093	-0.015	***	0.096	0.084	0.012	***	0.090
Educational and personal networks	0.865	0.803	0.062	***	0.782	0.846	-0.064	***	0.814
<u>Work experience - age 16</u>									
School work experience	0.261	0.346	-0.085	***	0.303	0.360	-0.057	***	0.331
Commercial awareness	0.339	-0.003	0.342	***	-0.001	0.117	-0.118	***	0.057
<u>School type - age 16</u>									
Private school	0.174	0.037	0.137	***	0.067	0.054	0.012	***	0.061
Grammar school	0.086	0.047	0.039	***	0.054	0.055	-0.001		0.054
State school	0.740	0.916	-0.176	***	0.879	0.891	-0.012	**	0.885
<u>Educational attainment - age 16+</u>									
No. GCSEs grade A-C (and eqs.)	5.905	3.039	2.867	***	3.330	3.767	-0.437	***	3.544
No. of A-levels grade A-C (and eqs.)	1.106	0.336	0.770	***	0.462	0.482	-0.019		0.472
Undergraduate degree	0.409	0.130	0.279	***	0.183	0.175	0.009		0.179
Degree * Russell* 1st or 2:1	0.067	0.013	0.054	***	0.021	0.024	-0.003		0.022
Degree * Russell* 2.2, 3rd, pass	0.047	0.012	0.034	***	0.020	0.016	0.004		0.018
Degree * Non-Russell* 1st or 2:1	0.120	0.043	0.077	***	0.053	0.060	-0.007	**	0.056
Degree * Non-Russell* 2.2, 3rd, pass	0.101	0.039	0.062	***	0.052	0.048	0.004		0.050
Degree * STEM	0.110	0.036	0.075	***	0.064	0.033	0.031	***	0.049
Degree * LEM	0.061	0.015	0.046	***	0.025	0.022	0.003		0.023
Degree * OSSAH	0.118	0.035	0.084	***	0.031	0.069	-0.038	***	0.049
Degree * Combined	0.007	0.004	0.003	***	0.003	0.007	-0.003	**	0.005
Higher degree	0.053	0.015	0.039	***	0.026	0.018	0.008	***	0.022
<u>Labour market choices</u>									
Full time caring/home ever	0.131	0.159	-0.028	***	0.015	0.298	-0.283	***	0.154
Part time ever	0.290	0.308	-0.018		0.058	0.560	-0.502	***	0.304
N	1968	9186			5672	5482			11154

*** 99% confidence ** 95% confidence * 90% confidence

'Sig.' columns show whether the SES and gender differences in mean characteristics are statistically significant.

Table A3.5: Marginal effects of SES and gender on access to elite occupations (interacted model)

	Elite occupations (all)			Managerial			Professional			Professional								
										STEM			Business & law			Other public service		
	Coeff.	Std. Err.	Sig.	Coeff.	Std. Err.	Sig.	Coeff.	Std. Err.	Sig.	Coeff.	Std. Err.	Sig.	Coeff.	Std. Err.	Sig.	Coeff.	Std. Err.	Sig.
SES x Gender	0.079	0.024	***	0.035	0.023		0.068	0.020	***	0.064	0.015	***	0.012	0.013		-0.003	0.008	
SES	0.196	0.017	***	0.122	0.016	***	0.107	0.013	***	0.041	0.008	***	0.056	0.009	***	0.017	0.006	***
Gender	0.070	0.009	***	0.039	0.008	***	0.045	0.006	***	0.055	0.004	***	-0.005	0.003		-0.003	0.002	
R-squared		0.037			0.017			0.049			0.069			0.039			0.016	
N		11154			11154			11154			11154			11154			11154	

Table A3.6: Predictors of access to elite occupations

	Model 0			Model 1			Model 2			Model 3			Proportion of the elite son advantage (34.5ppt) accounted for by each characteristic
	Coeff.	Std. Err.	Sig.	Coeff.	Std. Err.	Sig.	Coeff.	Std. Err.	Sig.	Coeff.	Std. Err.	Sig.	
SES and Gender													
Elite son	0.345	0.016 ***		0.287	0.019 ***		0.248	0.020 ***		0.190	0.021 ***		
Elite daughter	0.196	0.016 ***		0.102	0.018 ***		0.063	0.018 ***		0.014	0.018		
Non-elite son	0.070	0.009 ***		0.110	0.011 ***		0.114	0.011 ***		0.110	0.012 ***		
Non-elite daughter (base 22.5%)													
Childhood skills - age 10													
<i>Non-cognitive skills</i>													
<i>Self-perception</i>													
- Locus of control				0.024	0.006 ***		0.020	0.006 ***		0.012	0.006 *		1.6%
- Self esteem				0.002	0.006		0.002	0.006		0.001	0.006		0.2%
- Academic self concept				0.008	0.005		0.007	0.005		0.005	0.006		0.3%
<i>Self-control</i>													
- Externalising behaviour				-0.019	0.006 ***		-0.015	0.006 ***		-0.008	0.006		0.0%
- Application				0.030	0.007 ***		0.023	0.007 ***		0.014	0.007 **		0.3%
<i>Social Skills</i>													
Social Skills				0.011	0.006 **		0.015	0.006 ***		0.018	0.006 ***		0.6%
<i>Emotional</i>													
Emotional				-0.002	0.005		-0.004	0.005		-0.006	0.006		0.4%
<i>Cognitive skills</i>													
<i>Reading</i>													
Reading				0.025	0.009 ***		0.018	0.009 **		0.011	0.009		1.5%
<i>Maths</i>													
Maths				0.054	0.008 ***		0.046	0.009 ***		0.031	0.009 ***		6.1%
<i>British ability scale</i>													
British ability scale				0.008	0.007		0.006	0.007		0.000	0.007		0.0%
<i>Language comprehension</i>													
Language comprehension				0.028	0.006 ***		0.022	0.006 ***		0.013	0.007 **		2.6%
<i>Spelling</i>													
Spelling				-0.005	0.007		-0.002	0.007		-0.006	0.007		-0.2%
Career self-management - age 16													
<i>Aspirations</i>													
<i>High wage</i>													
High wage							0.054	0.033 *		0.049	0.033		0.4%
<i>Promotion</i>													
Promotion							0.037	0.024		0.034	0.024		0.7%
<i>Challenge</i>													
Challenge							0.082	0.021 ***		0.066	0.021 ***		0.7%
<i>Security</i>													
Security							0.057	0.028 **		0.051	0.028 *		0.7%
<i>Professional</i>													
Professional							0.133	0.013 ***		0.059	0.014 ***		4.6%
<i>Networks</i>													
<i>No network</i>													
No network							-0.023	0.058		-0.032	0.059		-0.1%
<i>Personal network only</i>													
Personal network only							0.067	0.034 **		0.072	0.034 **		-0.2%
<i>Educational and personal networks</i>													
Educational and personal networks							0.071	0.027 ***		0.065	0.028 **		0.2%
<i>Work experience</i>													
<i>School work experience</i>													
School work experience							-0.011	0.014		0.004	0.014		-0.2%
<i>Commercial awareness</i>													
Commercial awareness							0.036	0.009 ***		0.026	0.009 ***		1.6%
Education - age 16+													
<i>School type</i>													
<i>Private school</i>													
Private school										0.062	0.022 ***		3.0%
<i>Grammar school</i>													
Grammar school										0.020	0.022		0.2%
<i>Attainment</i>													
<i>No. good GCSEs</i>													
No. good GCSEs										0.014	0.002 ***		9.9%
<i>No. good A-levels</i>													
No. good A-levels										0.010	0.007		2.1%
<i>Degree * Russell * 1st or 2:1</i>													
Degree * Russell * 1st or 2:1										0.186	0.098 *		2.8%
<i>Degree * Russell * 2:2, 3rd, pass</i>													
Degree * Russell * 2:2, 3rd, pass										0.125	0.099		1.4%
<i>Degree * Non-Russell * 1st or 2:1</i>													
Degree * Non-Russell * 1st or 2:1										0.131	0.094		2.4%
<i>Degree * Non-Russell * 2:2, 3rd, pass</i>													
Degree * Non-Russell * 2:2, 3rd, pass										0.109	0.094		2.2%
<i>Degree * STEM</i>													
Degree * STEM										0.049	0.093		1.6%
<i>Degree * LEM</i>													
Degree * LEM										0.134	0.097		1.9%
<i>Degree * OSSAH</i>													
Degree * OSSAH										-0.101	0.094		-0.9%
<i>Degree * Combined</i>													
Degree * Combined										0.133	0.112		0.0%
<i>Higher degree</i>													
Higher degree										0.053	0.035		0.8%
R-squared		0.048			0.120			0.136			0.178		
N		11154			11154			11154			11154		

*** 99% confidence ** 95% confidence * 90% confidence

Models include controls for ethnicity, UK region of origin, non-UK, mother's and father's age at birth, number of survey waves present.

Controls and missing dummies are not shown on the table. If they were, the total of the 34.5ppt elite male advantage accounted for by Model 3 would be 44.8% as per Table 4.

The proportion accounted for by each characteristic is calculated as the difference in the means between elite sons and non-elite daughters, multiplied by the coefficients above from Model 3

Table A3.7: Predictors of access to elite occupations, split by occupational type

	Elite occupations			Managerial			Professional			Professions								
										STEM		Business & Law			Other public service			
	Coeff.	Std. Err.	Sig.	Coeff.	Std. Err.	Sig.	Coeff.	Std. Err.	Sig.	Coeff.	Std. Err.	Sig.	Coeff.	Std. Err.	Sig.	Coeff.	Std. Err.	Sig.
SES and Gender																		
Elite son	0.190	0.021 ***		0.097	0.018 ***		0.100	0.015 ***		0.106	0.015 ***		0.007	0.004 *		0.000	0.001	
Elite daughter	0.014	0.018		0.009	0.015		0.016	0.010 *		0.015	0.008 **		0.003	0.004		0.000	0.001	
Non-elite son	0.110	0.012 ***		0.065	0.010 ***		0.056	0.007 ***		0.057	0.006 ***		0.000	0.003		0.001	0.001	
Non-elite daughter - base access rates:	22.5%			18.0%			6.2%			2.0%			2.9%			1.4%		
Childhood skills - age 10																		
<i>Non-cognitive skills</i>																		
<i>Self-perception</i>																		
- Locus of control	0.012	0.006 *		0.012	0.006 *		0.001	0.003		-0.002	0.002		0.002	0.001		0.000	0.001	
- Self esteem	0.001	0.006		-0.004	0.005		0.006	0.003		0.004	0.002 *		0.000	0.001		0.001	0.001	
- Academic self concept	0.005	0.006		0.008	0.005 *		-0.004	0.003		-0.003	0.002 *		-0.001	0.001		0.000	0.001	
<i>Self-control</i>																		
- Externalising behaviour	-0.008	0.006		-0.003	0.005		-0.011	0.003 ***		-0.003	0.002		-0.003	0.001 *		-0.003	0.001 ***	
- Application	0.014	0.007 **		0.006	0.006		0.008	0.004 **		0.002	0.002		0.003	0.002 *		0.001	0.001 *	
<i>Social Skills</i>																		
Social Skills	0.018	0.006 ***		0.016	0.005 ***		-0.002	0.003		0.002	0.002		-0.001	0.001		-0.001	0.001 *	
<i>Emotional</i>																		
Emotional	-0.006	0.006		-0.004	0.005		0.000	0.003		0.001	0.002		0.000	0.001		0.000	0.001	
<i>Cognitive skills</i>																		
<i>Reading</i>																		
Reading	0.011	0.009		0.003	0.008		0.008	0.005		0.002	0.003		0.002	0.002		0.001	0.001	
<i>Maths</i>																		
Maths	0.031	0.009 ***		0.022	0.008 ***		0.010	0.005 **		0.005	0.003		0.007	0.002 ***		-0.001	0.001	
<i>British ability scale</i>																		
British ability scale	0.000	0.007		0.002	0.006		-0.003	0.004		0.001	0.003		-0.004	0.002 **		0.001	0.001	
<i>Language comprehension</i>																		
Language comprehension	0.013	0.007 **		0.006	0.006		0.006	0.003 *		0.003	0.002		0.001	0.001		0.000	0.001	
<i>Spelling</i>																		
Spelling	-0.006	0.007		-0.003	0.006		0.001	0.004		-0.002	0.003		0.003	0.002		0.000	0.001	
Career self-management - age 16																		
<i>Aspirations</i>																		
High wage	0.049	0.033		0.049	0.030 *		0.003	0.017		-0.012	0.011		0.009	0.008		0.002	0.003	
Promotion	0.034	0.024		0.040	0.021 *		0.005	0.013		-0.008	0.008		0.013	0.006 **		-0.001	0.002	
Challenge	0.066	0.021 ***		0.061	0.019 ***		0.012	0.011		0.011	0.008		-0.002	0.004		0.001	0.002	
Security	0.051	0.028 *		0.046	0.025 *		0.011	0.015		0.001	0.010		0.009	0.006		0.000	0.002	
Professional	0.059	0.014 ***		0.005	0.013		0.047	0.007 ***		0.023	0.005 ***		0.013	0.003 ***		0.001	0.001	
<i>Networks</i>																		
No network	-0.032	0.059		-0.007	0.051		-0.044	0.034		-0.012	0.023		-0.010	0.014		-0.055	0.072	
Personal network only	0.072	0.034 **		0.047	0.030		0.016	0.018		0.020	0.012		0.001	0.007		0.000	0.003	
Educational and personal networks	0.065	0.028 **		0.038	0.024		0.019	0.014		0.018	0.010 *		0.001	0.006		0.001	0.002	
<i>Work experience</i>																		
School work experience	0.004	0.014		-0.011	0.012		0.005	0.007		-0.003	0.005		0.005	0.003 *		-0.001	0.001	
Commercial awareness	0.026	0.009 ***		0.016	0.008 **		0.006	0.005		0.000	0.003		0.001	0.002		0.002	0.001 **	
Education - age 16+																		
<i>School type</i>																		
Private school	0.062	0.022 ***		0.002	0.018		0.024	0.010 **		0.005	0.006		0.009	0.003 ***		0.001	0.001	
Grammar school	0.020	0.022		0.009	0.019		-0.003	0.011		-0.007	0.007		0.003	0.004		-0.001	0.002	
<i>Attainment</i>																		
No. good GCSEs	0.014	0.002 ***		0.010	0.002 ***		0.005	0.001 ***		0.003	0.001 ***		0.001	0.000 ***		0.000	0.000	
No. good A-levels	0.010	0.007		-0.001	0.006		0.000	0.003		0.000	0.002		0.002	0.001 *		-0.001	0.001	
Degree * Russell * 1st or 2:1	0.186	0.098 *		0.151	0.086 *		0.032	0.041		-0.004	0.025		0.005	0.016		0.006	0.008	
Degree * Russell * 2:2, 3rd, pass	0.125	0.099		0.186	0.087 **		-0.019	0.042		-0.011	0.025		-0.011	0.016		0.004	0.008	
Degree * Non-Russell * 1st or 2:1	0.131	0.094		0.191	0.083 **		0.012	0.040		0.005	0.024		-0.007	0.015		0.007	0.008	
Degree * Non-Russell * 2:2, 3rd, pass	0.109	0.094		0.197	0.084 **		-0.019	0.040		-0.004	0.024		-0.009	0.015		0.000	0.008	
Degree * STEM	0.049	0.093		-0.170	0.083 **		0.110	0.040 ***		0.075	0.024 ***		-0.001	0.015		0.000	0.008	
Degree * LEM	0.134	0.097		-0.043	0.085		0.082	0.041 **		-0.024	0.025		0.041	0.016 ***		-0.001	0.008	
Degree * OSSAH	-0.101	0.094		-0.153	0.083 *		0.005	0.040		-0.015	0.025		0.004	0.015		0.001	0.008	
Degree * Combined	0.133	0.112		0.000	0.096		0.058	0.046		-0.014	0.032		0.028	0.017		0.003	0.008	
Higher degree	0.053	0.035		-0.073	0.028 **		0.057	0.013 ***		0.028	0.008 ***		-0.003	0.005		0.007	0.002 ***	
R-squared	0.178			0.103			0.235			0.236			0.237			0.197		
N	11154			11154			11154			11154			11154			11154		
Mean access rate	0.302			0.225			0.110			0.061			0.037			0.015		
*** 99% confidence ** 95% confidence * 90% confidence																		
Controls included for ethnicity, UK region of origin, non-UK, mother's and father's age at birth and number of survey waves present																		

A3.8: The potential role of labour market choices in creating barriers to access to elite occupations

This brief analysis explores whether labour market choices may contribute to explaining the gap in access to elite occupations between elite sons and non-elite daughters.

Firstly, there appears to be a strong correlation between labour market choices and elite or non-elite occupational status which suggests a possible penalty or incompatibility between ever working part time or ever having full time caring/home responsibilities and ever being employed in an elite occupation. Specifically, individuals who ever report having full time home/caring responsibilities (age 26-42) are 16.6ppt less likely to ever access an elite occupation than individuals without these responsibilities (16.1% v 32.7%). Similarly, individuals who ever work part time (age 26-42) are 14.7ppt less likely to ever access elite occupations than people who have never worked part time (20.0% v 34.7%)

Secondly, there are significant gender and SES disparities in labour market choices, although the gender gaps are much wider and therefore more influential (Table A3.8 .1). For gender, daughters are 28.3ppt more likely to have full time home/caring responsibilities than sons (29.8% v 1.5%) and 50.2ppt more likely to ever work part time (56.0% v 5.8%). For SES, individuals from non-elite backgrounds are 2.8ppt more likely to ever have full time home/caring responsibilities than individuals from elite backgrounds (15.9% v 13.1%), however working part time is not significantly associated with SES. As there is no additional SES x gender interaction to advantage elite sons even further this suggests non-elite women could face a large ‘double’ disadvantage relating to labour market choices, rather than a triple one, although it is the gender effects which are most pronounced.

The full extent of the disparity in labour market choices is therefore that non-elite daughters are 25 times more likely to ever have full time home or family caring responsibilities than elite sons (30.7% vs 1.2%) and are almost ten times more likely to ever work part-time (56.7% vs 5.9%) (Appendix A3.3). Panel D (Table A3.8.2) illustratively shows how incorporating these labour market choices into the analysis would affect the unexplained advantages for elite sons, elite daughters and non-elite sons when accessing elite careers (previously seen in Table 3.4 Panel B). These figures make the strong assumption that labour market choices influence occupational outcomes rather than vice versa, so should be viewed with caution. However, this shows that for access to

elite occupations overall, labour market choices could substantially explain the remaining advantage for elite sons (19.0ppt further reduces to 7.6ppt) and could fully explain the remaining advantages for non-elite sons (11.0ppt further reduces to 0.1ppt). Furthermore, labour market choices could also fully explain the remaining advantages for elite sons (and non-elite sons) in accessing managerial careers and the remaining advantages for elite sons in accessing business and law professions. They could also partially explain advantages for elite and non-elite sons when accessing STEM professions.

It is notable that even after possibly over emphasising the role of labour market choices on access to elite occupations (since some choices may follow occupational outcomes rather than precede them), elite males are still a third more likely to access elite occupations than non-elite females (7.6ppt over 22.5%). This is driven by SES and gender barriers to STEM professions where advantages remain for elite sons (8.1ppt), elite daughters (1.4ppt) and non-elite sons (4.4ppt), all compared to non-elite daughters (2.0% access rate). This shows that labour market choices are likely to be important to consider in any related analysis, but they are unlikely to fully explain the remaining advantages of elite males to elite occupations overall, or the remaining SES and gender barriers in STEM professions. Further exploration of which attributes predict access to these careers is required.

Table A3.8.1 SES and gender disparities in labour market choices

	Raw difference			Raw difference split in interacted model									Raw SES gap			Raw gender gap		
	Elite sons (vs non-elite daughters)			Elite daughter (vs non-elite daughter)			Non-elite son (vs non-elite daughter)			Additional third advantage for elite sons			Elite vs non-elite background			Sons vs daughters		
	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.	Coeff.	S.E.	Sig.
<i>Labour market choices</i>																		
Full time caring/home ever	-0.295	0.015	***	-0.053	0.012	***	-0.291	0.007	***	0.049	0.016	***	-0.028	0.009	***	-0.283	0.006	***
Part time ever	-0.507	0.016	***	-0.039	0.014	***	-0.509	0.008	***	0.041	0.019	**	-0.018	0.011		-0.502	0.007	***

Table A3.8.2 Illustrative unexplained advantages in access to elite occupations – after including labour market choices

Panel D: Remaining unexplained effects (illustrative) - including labour market choices																		
	Elite occupations (all)			Managerial			Professional			STEM			Professional Business & law			Other public service		
	Coeff.	Std. Err.	Sig.	Coeff.	Std. Err.	Sig.	Coeff.	Std. Err.	Sig.	Coeff.	Std. Err.	Sig.	Coeff.	Std. Err.	Sig.	Coeff.	Std. Err.	Sig.
	<u>SES and Gender</u>																	
Elite son	0.076	0.021	***	0.008	0.016		0.061	0.013	***	0.081	0.015	***	-0.002	0.003		0.000	0.001	
Elite daughter	0.009	0.018		0.004	0.015		0.014	0.010		0.014	0.008	*	0.002	0.003		-0.001	0.001	
Non-elite son	0.006	0.013		-0.019	0.011	*	0.030	0.007	***	0.044	0.006	***	-0.007	0.003	***	0.000	0.001	
Non-elite daughter (base cat)		22.5%			18.0%			6.2%			2.0%			2.9%			1.4%	
R-squared		0.197			0.122			0.242			0.239			0.250			0.199	
N		11154			11154			11154			11154			11154			11154	
Panel E: Proportion of elite male advantage explained by the model (illustrative) - including labour market choices																		
% explained		78.1%			96.1%			72.4%			49.0%			102.5%			102.9%	
% unexplained		21.9%			3.9%			27.6%			51.0%			-2.5%			-2.9%	

*** 99% confidence ** 95% confidence * 90% confidence

Controls in Panel D include demographics, childhood skills, career self-management behaviours, educational experiences and labour market choices

6.4. Appendix – Chapter 4

Appendix 4 has been redacted for reasons of commercial sensitivity

Figure A4.1: Recruitment process flowchart

Figure A4.2: Percentage difference in network use by SES (compared to base SES)

Table A4.1: Marginal effects of networks at each stage of the recruitment process including professional contacts

Table A4.2: Pass rates by network for each stage of the recruitment process

Table A4.3: Percentage of applicants from each school type who have a graduate parent or are not eligible for FSM

Table A4.4: Sample composition by network and SES.

Table A4.5: Sample composition by network and SES, by stage

Table A4.6: Pass rates by SES and networks, by stage

Table A4.7: Parental occupation of applicants who are influenced by relatives, split by parental education

Table A4.8: Final non-interacted model (from RQ1)

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