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Socioeconomic inequality in access to high-status colleges: A cross-country comparison

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ABSTRACT

This paper considers the relationship between family background, academic achievement in high school and access to high-status postsecondary institutions in three developed countries (Australia, England and the United States). We begin by estimating the unconditional association between family background and access to a high status university, before examining how this relationship changes once academic achievement in high school is controlled. Our results suggest that high achieving disadvantaged children are much less likely to enter a high-status college than their more advantaged peers, and that the magnitude of this socio-economic gradient is broadly similar across these three countries. However, we also find that socio-economic inequality in access to high-status *private* US colleges is much more pronounced than access to their *public* sector counterparts (both within the US and when compared overseas).

1. Introduction

In the United States, being able to access high quality college education is thought to be an important determinant of later economic success (Haveman & Smeeding, 2006; Bowen, Chingos, & McPherson, 2011). Yet young people from disadvantaged backgrounds remain underrepresented in the undergraduate population, particularly within high-status institutions (Bowen et al., 2011; Alon, 2009; Bastedo & Jaquette, 2011; Boliver, 2013). Graduates from such institutions tend to earn more in the labor market (Black & Smith, 2006; Hoekstra, 2009; Long, 2007; Walker & Zhu, 2013) due to the social networks they form and the additional skills and cultural capital they develop. Graduation from a high status college also sends a "quality" signal to employers (Rivera, 2011). Improving access to prestigious colleges is thus vital to ensuring disadvantaged children have equal opportunity to succeed.

It is unclear the extent to which the US stands out internationally in the degree of stratification of its higher education system. Other countries, including England and Australia, also have well-defined elite university sectors. Research from these countries indicates that English elite universities also confer substantial labor market rewards (Hussain, McNally, & Telhaj, 2008) and have high levels of socioeconomic inequality in admissions (Boliver, 2011). Despite numerous similarities between these three countries (e.g., language, culture, economies, income inequality, educational achievement, university attainment rates, historical ties), there are also reasons why elite college access may be more socioeconomically unequal in the US than England or Australia. This includes differences in the cost of tuition, provision of financial aid, geographic dispersion of high status universities, and the complexity of the admissions process. However, to date no single study has compared socioeconomic inequality in access to elite colleges across multiple national contexts. This paper fills this gap in the literature.

Since students entering elite universities have higher academic achievement – indeed elite institutions are explicitly defined by their selectivity – it is important that prior achievement is accounted for when examining socioeconomic inequality in college access. We conceptualize the role of academic achievement in terms of the direct and indirect effects (also known as secondary and primary effects) of socioeconomic status on an educational transition (Boudon, 1974; Jackson, Erikson, Goldthorpe, & Yaish, 2007). 'Indirect' effects are due to the higher academic achievement of higher SES students, while 'direct' effects are those factors influencing educational transitions above and beyond scholastic achievement—including financial resources, knowledge of the application process, information, and family connections.

Our contribution to the literature is therefore three-fold. To our knowledge, this is the first paper to examine qualitative differentiation of higher education in a cross-national comparative context,

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where the qualitative dimension of interest is 'high status' universities rather than academic or vocational orientation. Second we examine the extent to which academic achievement in high school drives socioeconomic differences in access to high-status universities, using measures of high school achievement that are more cross-nationally comparable than those of prior studies. Finally, distinct from other comparative studies, we consider differences between elite public and private universities in the US, and how access to these compares to high status colleges internationally.

2. Country overviews and hypotheses

Table 1 provides key information about Australia, England and the United States. Overviews of school-to-college transitions are provided below.

2.1. Australia

Young people graduate from high school at approximately age 18. This is a prerequisite for undertaking an undergraduate degree. University entrance is then determined by young people's course grades (Tertiary Entry Rank—TER) during the last two years of high school. High TER scores are required for entrance into more prestigious universities. Table 1 illustrates that 37 percent of young people enter college, with 10 percent attending a high status Group of Eight institution (these are all public sector universities).

Tuition costs are heavily subsidized. Students do not pay for their tuition upfront. Rather a low-interest, income contingent loan is provided, which only has to be repaid after graduation and once income reaches a particular threshold. Hence, if a graduate fails to find a job, they do not have to pay back any of their loan. Research on access into and returns from high status universities within Australia is very limited. The authors know of no studies to have considered economic returns, while only Jerrim and Vignoles (2015) has considered SES differences in access. Nevertheless, Table 1 illustrates that at age 25 Group of Eight graduates earn, on average, US$44,600 compared to US$42,000 for other graduates. This difference in wage returns (US$2600) is slightly lower than in England and the US (see Table 1).

2.2. England

Young people in England can choose to leave school at age 16. Those who remain typically choose three or four subjects to study for a further two years ('A-Levels'). Teenagers apply to college during their final year in school. Up to six subject-institution combinations are ranked by preference, with high status colleges and subjects requiring high A-Level grades[1]. Table 1 indicates that 39 percent of young people enter college, with 12 percent attending a high status Russell Group institution (these are all public sector universities). Bachelor's degrees take three years to complete.

Up to October 2012, the period to which our empirical data refers, the maximum tuition fee was £3465 ($4300) per year. Almost every university charged this amount, but no tuition fee had to be paid up front. Rather, students received an income-contingent loan, at a zero real interest rate, to cover the cost of study (greatly reducing the financial risks of college attendance; Chapman & Ryan, 2005). This loan has to be repaid after graduation at a rate of nine percent on all income over £15,000 ($23,000). Any remaining debt is written off after 30 years. Low-income families were also provided grants worth £3000 ($4000) per year.

There is a small literature on access to and returns from high status universities in England. Both Chevalier and Conlon (2003) and Hussain et al. (2008) estimate the high status wage premium to be approximately six percent, while Macmillan, Tyler, and Vignoles (2013) and Power and Whitty (2008) suggest they are also more likely to obtain professional employment. In contrast, Walker and Zhu (2013) argue that most of the elite university wage premium is likely to be due to selection effects. Chowdry, Crawford, Dearden, Goodman, and Vignoles (2013) and Anders (2012) suggest that family background has little impact upon access to high status colleges once school grades have been controlled. In contrast, Boliver (2013), Jerrim and Vignoles (2015) and Hemsley-Brown (2014) suggest that substantial SES gaps remain, even after conditioning upon high school achievement.

2.3. The United States

Approximately 89 percent graduate from high school at age 18 (Table 1). College application begins in the last year of high school. Test scores, grade point averages, course selections, extracurricular activities and personal essays are all considered by selective institutions (Bastedo & Flaster, 2014). However, many selective private colleges also have policies of admitting children whose parents have graduated from the institution ("legacy" applicants—see Golden, 2007; Stevens, 2009), with acceptance rates up to five times higher than for non-legacy applicants (Golden, 2010; Bowen & Bok, 2000). 44 percent of young people enroll in four-year colleges, with 13 percent attending 'more selective' institutions (Carnegie classification). The private sector accounts for 37 percent of enrollment in full-time four-year undergraduate degree programs (NCES, 2011: Table 203)

The cost of college education is high and varies greatly across institutions. Average sticker costs at high status institutions are about $29,000 per year, though this rises to around $40,000 for those in the private sector (see Table 1). However, some elite institutions offer generous financial aid, while other forms of financial aid are also available (e.g. federal and institutional grants, subsidized loans). Some authors have thus argued that it may be low SES students' lack of knowledge of college costs, rather than an actual lack of affordability, that is driving the low proportion of disadvantaged students enrolled in high status institutions.

There is an extensive literature on high status college access and returns. Black and Smith (2006) suggest that the college wage premium is approximately six percent, though using data from one flagship state institution Hoekstra (2009) puts returns as high as 20 percent. Conversely, Dale and Krueger (2011) argue that such returns are largely due to selection effects, and that – barring some subgroups (e.g., traditionally disadvantaged students) – there is little economic benefit to attending a more selective university.

A number of studies have shown that young people from low-SES backgrounds are under-represented in high-status colleges (Pallais & Turner, 2006). Although some have argued that this can essentially be explained by SES differences in standardized test scores (Bowen, Kurzweil, & Tobin, 2005), others have found that large family background effects remain even once prior achievement has been controlled (Roksa, Grodsky, Arum, & Gamoran, 2007). Possible explanations include: a lack of information about aid and application processes at selective institutions (Hoxby & Turner, 2013); tuition costs (Hill, Winston, & Boyd, 2005); geographic dispersion (Hill & Winston, 2010); and the impact of legacy applications (Hurwitz, 2011). This literature also examines "undermatching" – high achieving, low SES students attending lower status institutions than they are qualified for (Bowen et al., 2011; Bastedo & Flaster, 2014; Kurlaender & Grodsky, 2013). Thus, the literature on selective college access is much more extensive than in most other countries (including England and Australia). A key

[1] No distinction is made between "major" and "minor" subjects. Students apply to a specific program offered by that college.

Table 1
Key country statistics.

	Source	Australia	England	US
Economy				
GDP per capita	OECD	43200	35100	49,800
Income inequality (Gini coefficient)	LIS	0.31	0.34	0.37
Intergenerational transmission of income (elasticity)	Blanden (2013)	0.25	0.37	0.41
Secondary school achievement				
% Complete upper secondary school (age 18)	Author	78	53	89
PISA 2009 reading	OECD	515	494	500
PISA SES achievement gap reading 2009	Jerrim and Vignoles (2015)	92	93	106
College enrollment rates				
% Bachelor's degree	Author calculations	37	39	44
% Not high status		27	27	31
% High status (total)		10	12	13
% High status (public)		10	12	8
% High status (private)		–	–	5
College completion rates				
% All universities	Author calculations	82	79	61
% High status (total)		87	89	77
% High status (public)		87	89	76
% High status (private)		–	–	79
Length of typical bachelor's degree				
Years	–	3 to 4	3	4
Average tuition fee per year (US$ PPP)				
All universities	IPEDS/Author calculations	~4500	~4300	~12,000
High status		~4500	~4300	~18,000
High status (public)		–	–	~8000
High status (private)		–	–	~33,000
Average total cost: (gross/net)				
Author calculations/IPEDS data				
All universities		Income contingent	Income contingent	~26,000/~16,000
High status				~29,000/~19,000
High status (public)		–	–	~22,000/~15,000
High status (private)		–	–	~40,000/~27,000
Average total cost low income students (net)				
All universities	Author calculations/IPEDS data	Income contingent	Income contingent	~12,000
High status				~12,000
High status (public)		–	–	~9000
High status (private)		–	–	~17,000
Mean graduate wages at age 25/26 (US$ PPP)				
Not high status	Author calculations/HESA data	42,016	34,474	37,206
High status		44.584	38,657	44,531
High status (public)		–	–	42,845
High status (private)		–	–	46,921

Notes/sources: Honors degrees are 4 years in Australia. All monetary values converted to US$ using PPP (http://stats.oecd.org/Index.aspx?DataSetCode=CPL). England graduation rates and average wages based upon Higher Education Statistics Authority (HESA) records. IPEDS = Integrated Post-secondary Education Data System. Low Income families defined as household income below $30,000 per annum. Gross total costs provided for in-state student living off campus. LIS = Luxemburg Income Study.

contribution of this paper is therefore placing this large US literature into a comparative context: are SES gaps in high status college access greater in the US than in other English speaking countries?

2.4. Hypotheses

The descriptions above suggest that access to an elite college involves a series of transitions. Young people must first complete high school, and then decide (a) whether to go to college and (b) which institution to attend.

Of these transitions, it is important to explain why we believe that entry into 'high-status' post-secondary institutions is an important qualitative dimension to focus upon. First, previous research has suggested that high-status universities have a strong "brand" value (Rivera, 2011); they are instantly associated with quality in the minds of students, parents and potential employers. Prestigious colleges therefore represent a qualitatively distinct group that is highly relevant to discussions of inequality within post-secondary education. Second, previous research has suggested that graduates from high-status universities gain substantial labor market rewards (Hoekstra, 2009; Hussain et al., 2008), and thus these institutions provide long-run advantages that high SES families are likely to seek out (Lucas, 2001). Third, at present these countries have unique data available, where a high quality longitudinal study has tracked a sample of young people over time—and includes the exact university that they attend. Finally, and perhaps most importantly, there are numerous channels by which high-SES groups can use their resources to improve their chances of entering such an institution. High-status universities thus offer an effective mechanism by which qualitative differentiation within post-secondary education can take place.

This final point is particularly relevant for the hypotheses we test in this paper. As Lucas (2001:1652) notes:

> socioeconomically advantaged actors secure for themselves and their children some degree of advantage wherever advantages are commonly possible

Thus, if there is advantage to be gained by attending a high-status university, high SES parents will do everything in their power to seek out this advantage and provide it to their children. Prior academic achievement is likely to be important for gaining access to high status institutions across all three countries, with higher-SES children known to have higher levels of achievement. But is this the only reason why high SES groups are more likely to attend a high-status university? Although some have argued that this might be the case (Chowdry et al., 2013; Marks, 2013), or that educational achievement itself could be an arena in which high-SES families strategically gain advantages for their children (Alon, 2009), there

Table 2
Dataset summary.

	Australia	England	United States
Dataset	LSAY 2003	LSYPE 2004	ELS 2002
Initial population	15-year-olds	8th grade	High school sophomores
How sampled	Schools selected probability proportional to size (PPS). Pupils randomly selected within (average of 33 per school)	Schools selected PPS. 30 pupils randomly selected within	Schools selected PPS. Pupils randomly selected within
Ages data available	15 to 25	15 to 20	16, 18, 20 and 26
Year respondents turned 20	2007	2010	2006
Sample size wave 1	10,370	15,770	15,362
Sample size age 20	6609	8641	12,699
Attrition (%)	36	45	17
Response weights	Yes	Yes	Yes

are likely to be many other ways high SES families gain an advantage in accessing high status universities beyond simply obtaining higher school grades. Our first hypothesis therefore predicts that, in contrast to some recently expressed views, substantial inequalities in high status college access will remain in all three countries even once high school achievement has been controlled.

H1. High SES groups will be more likely to attend a high status university than their low SES peers across all countries, even once prior academic achievement has been controlled.

In our second and third hypotheses, we turn to the issue of cross-country variation. Our interpretation of the quote from Lucas (2001:1652) above is that he implicitly expects this to hold across different settings. Specifically, high SES families will attempt to gain whatever qualitative advantages they can for their children through the education system, and that this is likely to hold true across the developed world. Nevertheless, although we expect to find socioeconomic differences in access to high status universities within each of the three countries we consider (Australia, England and the United States), we also hypothesize that there will be cross-country variation in the magnitude of the family background effect. In particular, just because high SES families across all countries will *try* to gain qualitative advantages for their children within the higher education system, doesn't mean that they are equally *able* to do so. This will depend, at least in part, upon how the post-secondary education system is designed. In particular, we argue that inequalities in higher education are likely to be effectively maintained to a greater extent in the United States than either England or Australia.

This hypothesis stems from a number of observations summarized in Table 1 and described in the country outlines above. First, costs tend to be higher in the US than the other two countries. This may allow high SES families to use their superior financial resources to greater effect in this country, creating qualitative differences in institutional selection.

Second, there is much more price differentiation between high-status and "other" institutions in the US. Moreover, this differentiated and higher cost is accompanied by higher risk; whereas England and Australia provide students with zero real interest, income contingent loans, the US does not[2]. This combination of higher risk and greater price differentiation in the US may mean that cost and finance play a more prominent role in college selection than in the other two countries.

Third, because of the geographic dispersion of the US and Australia, attending a high-status college may mean young people have to migrate away from the family home, resulting in both financial and psychological costs. The same may not be true in England, where at least one high-status university is within commutable distance for most of the population.

Fourth, returns to college education are particularly high in the US (Jerrim and Vignoles, 2015), with potentially also greater rewards to attending a high status institution. For instance, Table 1 suggests that mean age 25/26 wages are around $7000 higher for high status college graduates (relative to other graduates) in the US, compared to a $4000 differential in England and $2500 in Australia. This suggests that there may be particularly strong incentives for high SES families in the US to pass on their economic advantages through this channel.

Finally, preferential treatment for "legacy" applicants is a lot less common in England and Australia in comparison to the US. This potentially offers another way for affluent US families to gain an advantage, which isn't so readily available in the other two countries.

Thus, to summarize, SES inequality in elite college access is likely to depend upon young people's price sensitivity, financial constraints, risk aversion, social networks, willingness to migrate and economic rewards. Moreover, there is reason to believe that each of the above is likely to play a particularly prominent role in the US. Thus our second hypothesis is:

H2. After controlling for high school achievement, socioeconomic differences in elite college access will be greater in the United States than either England or Australia

Finally, building upon the intuition presented above, high-status public institutions in the US tend to have lower sticker prices than their private counterparts, perhaps have less nepotism in their entry procedures, are more geographically accessible, and may not offer such high economic returns[3]. Moreover, private colleges are less likely to vary tuition fees by student residency (i.e. "in-state" tuition fees), with the particularly large sticker price possibly deterring working class families (even if actual prices are heavily discounted; Hoxby & Avery, 2012). Our final hypothesis is therefore that family background is likely to be *more* important for entry into high-status *private* institutions than their public sector counterparts:

H3. After controlling for high school achievement, SES differences in access to high status private colleges will be greater than for public colleges - both within the US and when compared internationally

3. Data and methods

We analyze three nationally-representative datasets:

Australia: The Longitudinal Study of Australian Youth 2003 (LSAY)

[2] Although the US has four income-driven repayment plans (PAYE, ICR. IBR and ISR), none of these have a zero real interest rate, and are thus not equivalent to the loans available in England and Australia.

[3] ELS 2002 refers to young people who typically entered college in 2004, and who were not subject to the recent increase in fees at many public colleges.

Table 3
Descriptive statistics.

	Australia		England		United States	
	High school graduation model (%)	Post-secondary transition model (%)	High school graduation model (%)	Post-secondary transition model (%)	High school graduation model (%)	Post-secondary transition model (%)
Parental education						
Below high school	13	12	11	11	6	5
High school	45	43	66	60	56	55
Bachelor degree	39	43	17	23	38	40
No information	3	2	6	6	0	0
Social class						
Working class	39	36	43	38	40	38
Intermediate	19	20	16	16	28	29
Professional	35	38	38	43	32	33
No information	6	6	3	3	0	0
Gender						
Male	50	48	49	45	50	48
Female	50	52	51	55	50	52
Educational attainment						
Below high school	20	0	40	0	10	0
High school only	41	53	23	44	45	50
Non-elite university	27	33	28	42	32	35
Elite university	12	14	9	14	13	15
PISA reading quintile						
Bottom	20	13	20	13	20	17
Second	20	19	20	16	20	19
Third	20	21	20	20	20	21
Fourth	20	22	20	24	20	21
Top	20	24	20	27	20	22
PISA math quintile						
Bottom	20	15	20	14	20	17
Second	20	19	20	16	20	19
Third	20	21	20	19	20	21
Fourth	20	22	20	23	20	21
Top	20	24	20	27	20	22
n	**6609**	**5232**	**8641**	**5233**	**12,699**	**11,633**

Australia		England		United States	
Ethnic group	%	Ethnic group	%	Ethnic group	**%**
White	88	White	87	White	60
Asian	10	Mixed	3	American Indian/Alaska Native	1
Indigenous	2	Indian	3	Asian, Pacific Islander	4
		Pakistani	2	Black or African American	14
		Bangladeshi	1	Hispanic, no race specified	7
		Black Caribbean	1	Hispanic, race specified	8
		Black African	2	More than one race	4
		Other	2		

Note: All figures refer to percentages. Survey response weights applied to adjust for non-response.

England: The Longitudinal Study of Young People in England 2004 (LSYPE)

United States: The Educational Longitudinal Study 2002 (ELS)

Table 2 provides further information on each survey. Survey weights are applied throughout our analysis to take attrition and non-response into account. All reported standard errors are clustered by high school (the primary sampling unit in each survey). Descriptive statistics for key variables can be found in Table 3.

3.1. Family background

Family background is measured using parental education and father's social class. Parental education has been recorded in terms of national qualifications. We have converted this information into International Standard Classification of Education (ISCED) levels—a schema that has been specifically designed by the United Nations Education, Scientific and Cultural Organization (UNESCO) to facilitate cross-national comparisons. Following existing practice in much of the cross-national comparative literature (e.g. Ermisch, Jantti, & Smeeding, 2012; Jackson, 2013) the following groups are formed:

'Low' education = ISCED 0–2		[less than high school]
'Medium' education = ISCED 3–5b	[high school to associate's degree]	
'High' education = ISCED 5a/6		[bachelor's degree and higher]

Father's occupation is recoded into the three-class Erickson–Goldthorpe–Portocarero (EGP) schema (Erikson, Goldthorpe, & Portocarero, 1979)[4]:

Professional
Intermediate
Working class

Mother's social class is used when father's is not available. We have checked the robustness of our findings to defining social class

[4] We follow Morgan (2012) and Marks (2011) in mapping ELS and LSAY occupational data into the EGP schema.

using a dominance approach similar to Morgan, Spiller, and Todd (2013) and found qualitatively similar results. Table 3 illustrates that the distribution of these variables is reasonably similar across countries—though the US has slightly fewer individuals in the lowest parental education group, and the UK slightly less in the highest parental education group.

3.2. Academic performance in high school

ELS and LSAY include Programme for International Student Assessment (PISA) reading and math test scores, while proxy PISA scores are available for the LSYPE (Jerrim and Vignoles, 2015). These have a high degree of cross-national comparability, but are measured at age 15 (three years before young people's post-secondary transitions).

Each dataset also contains additional information on course grades and other academic achievement toward the end of high school. ELS includes grade point average, age 18 cognitive math and SAT/ACT scores. The LSYPE includes exam grades at age 16 (General Certificate of Secondary Education or "GCSEs") and age 18 (A-Levels). Finally, the LSAY includes the percentile position of all high school graduates (Tertiary Entrance Rank—TER). The distribution of these achievement variables are presented in Table 4. These measures have the advantage of capturing multiple dimensions of academic achievement through to the end of high school, but have a lower level of international comparability than the PISA test scores. If the reliability of these measures differs across countries, then artificial cross-national variation in direct family background effects could be observed. We shall therefore illustrate how our results change when using (i) all achievement measures and (ii) PISA scores only.

3.3. High-status institutions

Institutions may be considered "high status" (considered desirable) for many reasons. This includes a reputation for offering strong teaching, having higher entry standards, conducting more and higher quality research, or for conferring economic and social advantages upon graduates. In this paper, "high status" institutions are conceptualized as those that are often perceived by young people and their families to offer particularly high economic and social rewards.

"High-status" universities in England are defined as the Russell Group (http://www.russellgroup.ac.uk/); a self-selected alliance of 24 research intensive institutions. A similar self-selected alliance of research-intensive universities (Group of Eight) is used in Australia (http://www.go8.edu.au/). These universities distinguish themselves from others by their research quality (via research grant income and strong national research assessments), claims about teaching quality (which are somewhat subjective), high entry criteria and their place in national (and international) university rankings. This definition therefore provides a close match for our conceptualization of high status institutions provided above.

As there is no direct equivalent to the Russell Group / Group of Eight in the United States, we use "highly/more selective" colleges according to the Carnegie classification (a ranking based upon entrants SAT/ACT scores). These universities have high entry criteria and, as Table 1 illustrates, tend to have graduates with high starting salaries. Moreover, this definition means that approximately one in nine young people access a high status institution within each of the three countries (see Table 1). However, as this grouping is based upon the ACT/SAT scores of entrants, our definition of "high status" in the US may be associated with family background and school achievement by design. This could, in turn, inflate the associations between family background, school achievement and elite university entry in the US, relative to the other countries. We therefore test the robustness of our results in Appendix G, by altering the 'high status' definition in England and Australia to also be based upon the average scores of entrants. Our main substantive conclusions remain largely unchanged.

Table 4
Descriptive statistics for school grades.

(i)Australia

	High school graduation model (%)	Post-secondary transition model (%)
Tertiary entry rank quintile		
Bottom	11	18
Second	11	19
Third	11	19
Fourth	13	21
Top	13	22
Not applicable	40	29
n	**6609**	**5232**

(ii) England

	High school graduation model (%)	Post-secondary transition model (%)
GCSE quartile (age 16 grades)		
Bottom	27	13
Second	22	19
Third	25	29
Top	25	39
A*—C GCSE English		
No	38	26
Yes	62	74
A*—C GCSE Math		
No	42	30
Yes	58	70
A—Level quintiles (age 18 grades)		
Bottom	12	11
Second	11	15
Third	11	17
Fourth	11	16
Top	10	16
Not applicable	45	24
n	**8641**	**5233**

(iii) United States

	High school graduation model (%)	Post-secondary transition model (%)
Grade point average (GPA) grades 9–12		
Mean score	2.7	2.8
Age 18 math quartile		
Bottom	22	22
Second	22	24
Third	22	24
Top	22	25
No information	11	5
SAT quintile		
Bottom	13	14
Second	13	14
Third	10	11
Fourth	13	14
Top	11	12
Not applicable	41	35
n	**12,699**	**11,633**

Note: All figures refer to percentages. Survey weights applied. GCSE = General Certificate of Secondary Education.
Note: Figures refer to percentages except for GPA. Survey response weights applied to adjust for non-response.

3.4. Empirical methodology

We closely follow the existing literature in modeling the transition into a high status university. We begin by considering the

probability of graduating from high school. A binary logistic regression model is estimated in each country:

$$\log\left(\frac{\pi}{1-\pi}\right) = \alpha + \beta \cdot S + \delta \cdot P + \varphi \cdot M + \Omega \cdot E \quad (1)$$

where π = probability of graduating from high school, S = social class (reference: working class), P = parental education (reference: high school education), M = gender, E = ethnicity.

As high school achievement is not controlled in (1), β and δ estimate the *total effect* of social class and parental education on the probability of graduating from high school. A second specification is then estimated, controlling high school achievement (G):

$$\log\left(\frac{\pi}{1-\pi}\right) = \alpha + \beta^* \cdot S + \delta^* \cdot P + \varphi^* \cdot M + \Omega^* \cdot E + \gamma^* \cdot G \quad (2)$$

where G = controls for PISA math and reading test quintiles (see Table 3).

β^* and δ^* thus give the *direct effect* of social class and parental education on the probability of graduating from high school. It has been noted by Allison (1999), Williams (2009) and Karlson, Holm, and Breen (2012) that estimates from non-linear response models depend upon error variance (unobserved heterogeneity), which changes as additional variables are included in the model. Thus differences between β and β^* and δ and δ^* could be due to what Karlson et al. (2012:291) call either "confounding" or "rescaling," and it is only the former that is of substantive interest. Karlson et al. (2012) have proposed a method to overcome this problem by rescaling the estimated logit coefficients. We apply this method, via the user-written "khb" Stata command, throughout our analysis.

The intuition behind modelling the second and third stages of the model (whether to enter college and whether to attend a high-status institution) is similar to the above, but extended to multiple categorical outcomes. The sample is first restricted to high school graduates only (Table 3 illustrates how this changes sample sizes), with multinomial logistic regression models (3) and (4) then estimated (note that the latter is identical to the former, but with controls added for high school achievement)[5]:

$$\log\left(\frac{\pi_j}{\pi_o}\right) = \alpha + \beta \cdot S + \delta \cdot P + \varphi \cdot M + \Omega \cdot E \quad (3)$$

where π_j = the probability of choosing response category j, π_o = the probability of choosing the baseline response category (non-elite four year college), $j = 0$ (non-elite four year college = baseline); 1 (does not enter college); 2 (enter selective college).

$$\log\left(\frac{\pi_j}{\pi_o}\right) = \alpha + \beta^* \cdot S + \delta^* \cdot P + \varphi^* \cdot M + \Omega^* \cdot E + \gamma^* \cdot G \quad (4)$$

where G = A vector of high school achievement measures (see Tables 3 and 4).

Interpretation of results closely follows the intuition for the high school transition described above. β and δ give the *total effect* of social class and parental education on the probability of making a given transition relative to the reference outcome category (non-elite four year college), and β^* and δ^* give the *direct effect*. All parameter estimates are reported after applying the method proposed by Karlson et al. (2012) to ensure comparability across nested models.

[5] Individuals who enrol in a college course below a bachelor's degree (e.g. a two-year associate's degree in the United States) are included in the "does not enrol in bachelor degree" group.

4. Results

This section summarizes findings from our empirical analysis. Throughout this section we refer to differences between 'advantaged' and 'disadvantaged' groups. 'Advantaged' is defined as having a father working in a professional occupation and at least one parent holding a bachelor's degree. 'Disadvantaged' is defined as families where the father has a working class occupation and neither parent has completed more than upper secondary school. Differences between these two groups are given by the combination of the professional (social class) and bachelor's degree (parental education) parameter estimates (recall that working class and high school education are the reference groups in models (1)–(4)).

4.1. Graduation from high school and transition to other (non-high-status) universities

Before reporting our main results on entry into a high-status university, we consider socioeconomic differences in completion of upper secondary school (and thus eligibility for the college transition), as well as the transition to other non-high-status universities. A full set of parameter estimates can be found in Appendices A and B. First, recall from Table 1 that total upper secondary completion rates are notably lower in England (53 percent) than Australia (78 percent) and the United States (89 percent). Yet SES inequalities across these countries are remarkably similar with respect to upper secondary school completion. The increased likelihood of completing high school among young people from 'advantaged' (professional with bachelor's degree) relative to 'disadvantaged' (working class with high school education) backgrounds is around 1.2 log-odds in all three countries, with there being no significant differences at conventional thresholds. The professional class and parental bachelor's degree parameter estimates are reduced by approximately 50 percent in all three countries once high school achievement has been controlled ('direct effect'). Nevertheless, students from 'advantaged' backgrounds remain around 0.6 log-odds (1.8 times) more likely to complete high school than students from 'disadvantaged' backgrounds in all three countries. Again, cross-national variation is modest, with all pairwise comparisons of countries insignificant at the five percent level.

Next, we consider the transition to a non-high-status university (the non-high-status versus no university contrast from models (3) and (4)). Note that students have a similar likelihood of entering a non-elite university in all three countries (27 percent in Australia and England and 31 percent in the United States—derived from Table 1). However, socioeconomic inequality varies somewhat more across the countries for this transition than for high school graduation. The increased likelihood of enrolling in a non-high-status university rather than no university for students from 'advantaged' versus 'disadvantaged' backgrounds is about 1.4 log-odds in Australia, 1.9 log-odds in the United States, and 2.4 log-odds in England (see Appendix B). All pairwise comparisons of countries are statistically significant at the five percent level. After controlling for high school achievement, parameter estimates are reduced by more than 50 percent in Australia (0.5 log-odds) and the United States (0.9 log-odds), compared to almost 80 percent in England (0.5 log-odds). In pairwise comparisons, the United States remain significantly different to England and Australia at the five percent level, even after high school achievement measures have been controlled.

4.2. Post-secondary transitions and access to a high status university

Tables 5A and 5B summarizes findings from multinomial logistic regression models (3) and (4) (recall that the sample has

Table 5A
Multinomial logistic regression results for entry into a high-status university versus a not high-status university: A cross-country comparison.

	Australia		England		United States	
	Total effect model Log-odds (SE)	Direct effect model Log-odds (SE)	Total effect model Log-odds (SE)	Direct effect model Log-odds (SE)	Total effect model Log-odds (SE)	Direct effect model Log-odds (SE)
Social class (Ref: Working class)						
Intermediate	0.415 (0.152)	0.246 (0.151)	0.233 (0.203)	0.09 (0.171)	0.357 (0.114)	0.185 (0.115)
Professional	0.631* (0.136)	0.308* (0.132)	0.594* (0.216)	0.132 (0.150)	0.736* (0.119)	0.416* (0.119)
Highest parental education (Ref: High school or some college)						
Did not complete high school	−0.078 (0.220)	−0.039 (0.219)	−0.075 (0.280)	0.194 (0.257)	−0.478 (0.293)	−0.263 (0.295)
Bachelor degree	0.747* (0.146)	0.411* (0.139)	1.382* (0.151)	0.653* (0.122)	1.043* (0.098)	0.455* (0.092)
Ethnicity	x	x	x	x	x	x
Gender	x	x	x	x	x	x
PISA reading score (Ref: Bottom quintile)						
Second quintile	– –	−0.424 (0.400)	– –	0.276 (0.477)	– –	−0.172 (0.300)
Third quintile	– –	−0.376 (0.414)	– –	0.246 (0.471)	– –	−0.223 (0.327)
Fourth quintile	– –	−0.254 (0.392)	– –	0.387 (0.485)	– –	0.018 (0.295)
Top quintile	– –	−0.165 (0.406)	– –	0.698 (0.481)	– –	0.034 (0.313)
PISA math score (Ref: Bottom quintile)						
Second quintile	– –	1.006* (0.458)	– –	0.469 (0.509)	– –	−0.08 (0.571)
Third quintile	– –	1.007* (0.475)	– –	0.406 (0.489)	– –	0.303 (0.583)
Fourth quintile	– –	1.213* (0.482)	– –	0.618 (0.460)	– –	0.316 (0.589)
Top Quintile	– –	1.461* (0.488)	– –	0.925* (0.473)	– –	0.451 (0.599)
Grades & other achievement measures	–	x	–	x	–	x
Constant	−1.995* (0.212)	−2.235* (0.495)	−2.728* (0.319)	−4.381* (1.197)	−2.599* (0.148)	−6.524* (0.477)
Pseudo R^2	**0.075**	**0.275**	**0.090**	**0.366**	**0.094**	**0.315**
n	**5,232**	**5,232**	**5,233**	**5,233**	**11,633**	**11,633**

Table 5B
Multinomial logistic regression results: a comparison of high-status public and private colleges in the United States.

	Public		Private	
	Total effect model Log-odds (SE)	Direct effect model Log-odds (SE)	Total effect model Log-odds (SE)	Direct effect model Log-odds (SE)
Social class (Ref: Working class)				
Intermediate	0.193 (0.128)	0.024 (0.128)	0.754* (0.171)	0.535* (0.170)
Professional	0.571* (0.134)	0.254 (0.132)	1.16* (0.173)	0.766* (0.172)
Highest parental education (Ref: High school or some college)				
Did not complete high school	−0.826* (0.348)	−0.595 (0.345)	−0.022 (0.445)	0.271 (0.452)
Bachelor degree	0.956* (0.115)	0.399* (0.108)	1.278* (0.136)	0.559* (0.131)
Ethnicity	x	x	x	x
Gender	x	x	x	x
PISA reading score (Ref: Bottom quintile)				
Second quintile	– –	−0.543 (0.318)	– –	1.344* (0.595)
Third quintile	– –	−0.562 (0.346)	– –	1.273* (0.602)
Fourth quintile	– –	−0.32 (0.301)	– –	1.519* (0.600)
Top quintile	– –	−0.348 (0.322)	– –	1.613* (0.600)
PISA math score (Ref: Bottom quintile)				
Second quintile	– –	0.401 (0.723)	– –	−1.082* (0.951)
Third quintile	– –	0.702 (0.747)	– –	−0.533 (0.933)
Fourth quintile	– –	0.85 (0.761)	– –	−0.776 (0.939)
Top quintile	– –	1.055 (0.776)	– –	−0.744 (0.937)
Grades & other achievement measures	–	x	–	x
Constant	−2.805* (0.170)	−6.500* (0.582)	−4.457* (0.242)	−10.074* (1.015)
Pseudo R^2	**0.087**	**0.293**	**0.087**	**0.293**
n	**11,633**	**11,633**	**11,633**	**11,633**

Notes: Samples restricted to high school graduates only. SE = standard error. 'Total effect' where no academic achievement measures controlled. 'Direct effect' where academic achievement measures are controlled. Survey response weights applied. Huber–White adjustment made to standard errors. Star indicates significantly different from 0 at five percent level. x Indicates where variables included in model but parameter estimates not reported in table. Full model estimates presented in Appendices B and C.

* Indicates significantly different from zero at the five percent level.

now been restricted to high school graduates only). This table focuses upon the relationship between parental education, social class, and the chances of entering a high-status college relative to starting a four-year degree at another (not high-status) institution. A full set of parameter estimates can be found in Appendix B. Panel A provides estimates for each of the three countries. Panel B separates the US results into public and private sector institutions.

Consistent with hypothesis H1, the total effect of parental education and social class is large and statistically significant in all three countries. For instance, young people in Australia from advantaged backgrounds are 1.38 log-odds more likely to enter a high-status institution than their disadvantaged peers[6]. This is significantly smaller than the gap in England (1.98 log-odds; $p = 0.08$) and the United States at the ten percent level (1.78 log-odds; $p = 0.06$). Nevertheless, high and low SES groups do clearly take qualitatively distinct routes through post-secondary education in each of the three countries.

As one might anticipate, the 'direct effect' of parental education and social class is substantially reduced once high school

[6] 1.38 is calculated as the combined effect of the "professional" (0.631) and "bachelor degree" (0.747) parameter estimate from Tables 5a and 5b.

achievement measures are controlled. Nevertheless, in accordance with hypothesis H1, non-trivial differences remain. In the United States, the professional class estimate declines from 0.74 (total effect) to 0.42 (direct effect), with the influence of high parental education dropping from 1.04 to 0.45. Yet the (net) odds of entering a high status college remain 2.4 times greater for young people from socio-economically advantaged backgrounds (as compared to young people from disadvantaged backgrounds). Thus the dominance of high SES groups within elite English, Australian and American post-secondary institutions cannot simply be explained by superior academic achievement in high school. There are other important ways by which high SES families gain important qualitative advantages within the post-secondary education system.

Next, we turn to hypothesis H2—are SES inequalities in elite college access more pronounced in the United States than in England and Australia? Overall, Table 5A suggests that this is not the case. In particular, note that the direct effect of social class (professional) and parental education (bachelor's degree) is of a similar magnitude in Australia and the United States (consistently around 0.40 log-odds). Likewise, although in England the bachelor's degree point estimate is larger (0.65 log-odds) and the professional class estimate is slightly smaller (0.13 log-odds), the combined influence of the two is broadly the same as for the other countries (0.79 log-odds). Indeed, differences between 'advantaged' and 'disadvantaged' groups range from 0.72 in Australia to 0.87 in the United States. This cross-national variation is small in terms of magnitude and not statistically significant at even the ten percent threshold. We are hence unable to substantiate our second hypothesis—SES differences in elite college access actually seem to be of similar size across these three countries.

This finding does, however, need to be caveated by interesting differences between public and private sector colleges within the US (hypothesis H3). These results can be found in Table 5B (Appendix C presents all parameter estimates). In particular, note how the total effect of family background is much larger for high-status *private* sector colleges (2.44 log-odds for the combined professional plus bachelor's degree parameter estimates) than their *public* sector counterparts (1.53 log-odds). This difference between public and private colleges, which is mainly (though not exclusively) being driven by social class, is large (0.91 log-odds) and statistically significant at the five percent level. Moreover, although the difference between private (1.33 log-odds) and public (0.65 log-odds) institutions is reduced to 0.68 log-odds when one considers the direct effect, it nevertheless remains sizable and significantly greater than zero.

How do high status public and private colleges in the US compare to high-status colleges overseas? By comparing the direct effects across Tables 5A and 5B, one can see that public sector US universities are similar to those in England and Australia. For instance, the combined professional plus bachelor's degree effect for *public* US colleges (0.65 log-odds) actually falls slightly below that for the other two countries (0.79 for England and 0.72 for Australia). Yet the opposite holds true for elite *private* sector colleges in the US, where the combined Bachelor's degree and Professional social class effect (1.33 log-odds) is significantly above the estimate for England ($p = 0.02$) and Australia ($p = 0.01$). Consequently, there is some suggestion that social stratification with respect to elite private sector college access in the US is more pronounced than for universities within the public sector (both within the United States and when compared overseas).

A potential difficulty with the cross-national comparison presented in Tables 5A and 5B is that all available academic achievement measures have been included in the 'direct effect' models, and these differ across countries. Hence we also run models controlling for only PISA math and reading test scores (which have greater international comparability). A full set of parameter estimates for the "PISA only" models can be found in Appendix D and E. These results are presented in Fig. 1.

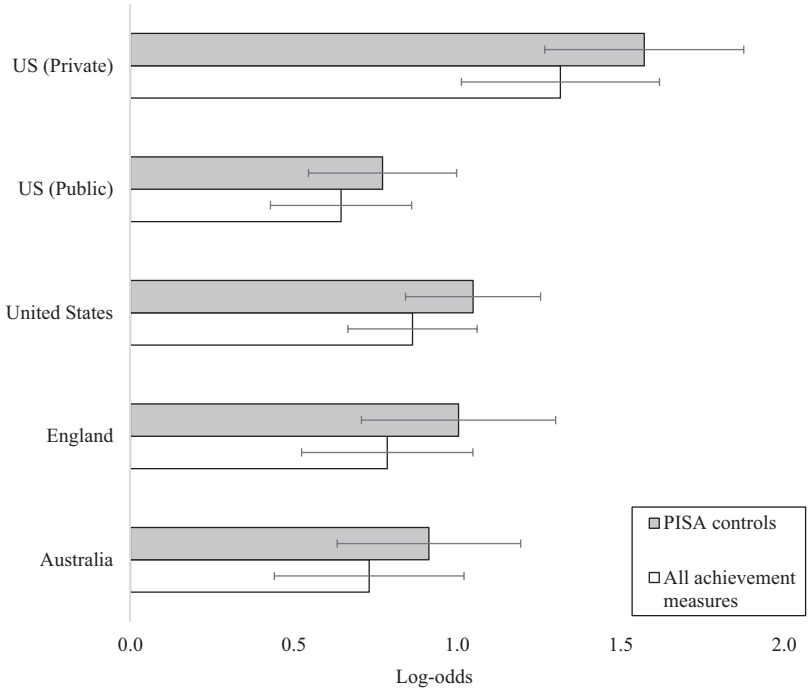

Fig. 1. *The direct effect of family background on attending a high-status university: a comparison of results when controlling for different measures of academic achievement. Notes*: Samples restricted to high school graduates only. Estimates refer to differences in attending a high status university (versus a not high-status university) between young people from 'advantaged' (professional + bachelor degree) and 'disadvantaged' (working class + high school education) family backgrounds. White bars where all academic achievement measures are controlled. Grey bars where PISA test scores are the only academic achievement controls. Thin black lines illustrate the 90 percent confidence interval. Survey response weights applied to adjust for non-response. Huber–White adjustment made to standard errors. A full set of parameter estimates can be found in Appendix B to E.

There are three important features of Fig. 1. First, as anticipated, the direct effect of family background is greater when only PISA scores are used as achievement controls. This reflects the fact that national specific measures provide additional information on young people's academic achievement, and that these are independently associated with the chances of entering a high status institution. Second, the difference in the direct effect between the 'PISA-only' and 'all achievement' results is relatively small, and does not vary substantially across countries. For instance, the direct effect in Australia, England and the US increases from 0.72, 0.79 and 0.87 log-odds when all achievement measures are included to 0.91, 1.05 and 1.05 when only PISA test scores are used. Finally, and perhaps most importantly, substantive conclusions regarding the cross-national comparison remain largely intact. The results of the 'PISA-only' models continue to suggest that SES inequalities in selective college access are similar within Australia, England and the United States, and that private sector US colleges stand out from all other groups.

We have also considered alternative definitions of 'high status' institutions. Firstly, within the US, we re-estimate models (3) and (4) having changed the 'high status' group to include only those colleges defined as 'most' or 'highly' selective according to the Barron index of college selectivity. When using this alternative definition, the direct effect of the combined professional and bachelor's degree parameter estimates equals 0.38 for high status public US colleges and 1.69 for high status private colleges. This is consistent with the findings discussed above and presented in Tables 5A and 5B. Second, we re-estimated models for England and Australia having re-defined high-status colleges using the average school grades of entrants. In both England and Australia, the combined effect of parental education and professional social class is slightly smaller when using this alternative definition. Nevertheless, one can still not reject the null hypothesis that SES inequalities in access to high status institutions are equal across the three countries, with private sector US colleges continuing to stand out from other groups. Further details, including a full set of estimates, can be found in Appendices F and G.

To conclude, Fig. 2 summarizes our findings by presenting the predicted probability of a *high-achieving* (top PISA math and reading quintile) white female making one of the following three transitions: (i) starting a four year degree at a high status college; (ii) starting a four-year degree at another (not high status) college and (iii) not starting a four-year bachelor's degree at all. Note that these are based upon estimates from Eq. (4) using PISA-only achievement controls (G). Predicted probabilities for the 'advantaged' group refer to a high-achieving white female whose father holds a professional job and at least one parent holds a bachelor's degree. The disadvantaged group is as the above, but whose father has a working class job and neither parent completed more than upper secondary schooling.

High achieving children from advantaged backgrounds have a 58 percent chance of entering a high status university in the United States, split evenly between public and private sector institutions. This compares to just a 27 percent chance for the disadvantaged group, with just a 9 percent chance that they will attend an elite private university. On the other hand, high-achieving disadvantaged students in the US have a 27 percent chance of not entering university at all, compared to just an 8 percent for their advantaged peers. Thus, the most likely post-secondary outcome for the high SES group is attendance at a selective institution, compared to non-selective university attendance for those from low SES backgrounds.

In England, high achieving young people from high SES backgrounds have a 53 percent chance of entering an elite university,

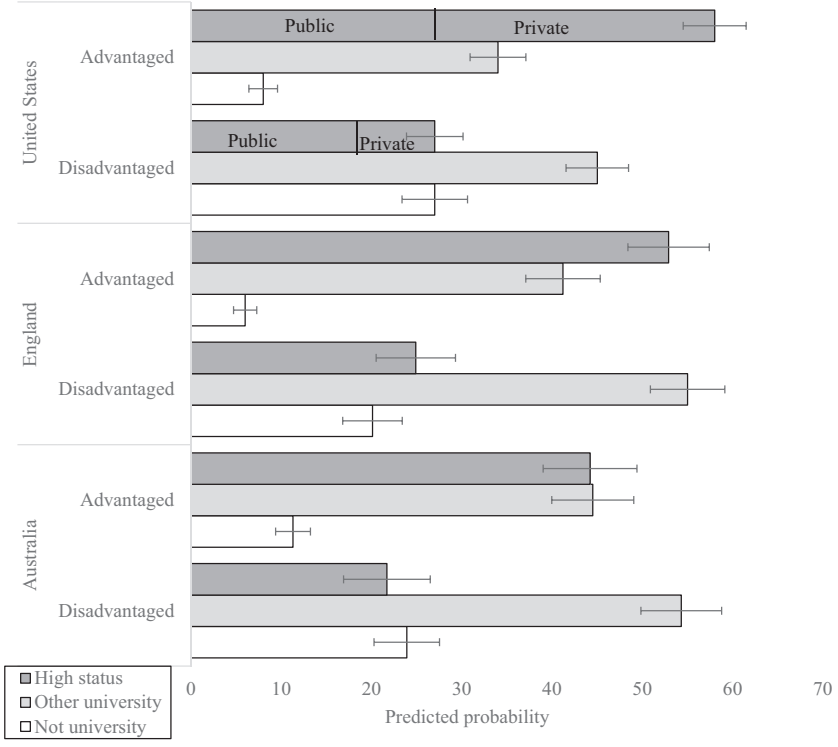

Fig. 2. *Predicted post-secondary destinations for high achieving young people from 'advantaged' and 'disadvantaged' backgrounds. Notes*: Samples restricted to high school graduates only. Predicted probabilities reported for a white female with PISA reading and math test scores in the top national quintile. Disadvantaged refers to young people from working class backgrounds, with neither of their parents completing more than high school. Advantaged refers to individuals from professional backgrounds where at least one parent holds a bachelor's degree. Results for high status universities in the United States broken down by public and private sector. Thin black lines illustrate the 90 percent confidence interval. A full set of parameter estimates from which these predicted probabilities are derived can be found in Appendix D. Survey response weights applied to adjust for non-response. Huber–White adjustment made to standard errors.

making this their most likely post-secondary destination. This compares to just a one-in-four chance for their low SES peers. Indeed, as in the United States, the most likely outcome for able children from disadvantaged homes is entrance into a non-selective post-secondary institution (55 percent chance). Moreover, there is a one-in-five chance high-achieving disadvantaged children will not enter university at all, compared to just a one-in-twenty chance for their equally high achieving but more advantaged peers.

Finally, in Australia, the high SES group have an equal chance of entering a selective versus a non-selective institution (approximately 45 percent for each outcome). In contrast, disadvantaged students have just a 22 percent probability of entering a high status university, compared to 54 percent for a non-selective institution. There is a 24 percent chance that the low SES group will not enter university at all, compared to 11 percent for those from socioeconomically advantaged backgrounds. Indeed, a notable feature of Fig. 2 is that, in all three countries, high-achieving disadvantaged children are just as likely to leave education as they are to enter a high status university.

4.3. Summary

Section 2 set out three hypotheses. The first (H1) was that substantial family background differences in elite college access would remain, even after high school achievement had been taken into account. Our empirical estimates suggest that while academic achievement in high school is clearly an important mechanism by which high SES families gain an advantage in accessing high status institutions, substantial direct effects of family background nevertheless remain. This suggests that high SES families are able to use their superior resources in multiple ways to gain qualitative advantages within the education system. This finding also has important practical implications: closing the academic achievement gap alone is unlikely to be enough to eliminate SES differences in important educational transitions.

There was less support, however, for our second hypothesis; against our expectations, SES inequality in high-status college access is remarkably similar across Australia, England and the United States. This may be somewhat surprising, given the significant heterogeneity across these three countries in how their higher education systems are designed. In particular, the comparatively low sticker price, little variation in cost between institutions, low risk financial aid packages, centralized admission processes and (potentially) lower returns in England and Australia does not seem to translate into significantly lower SES inequalities in elite college access (relative to the United States).

However, in addressing our third hypothesis, we have illustrated that this finding is mainly being driven by elite US colleges within the *public sector*. Socioeconomic inequality in access to high-status *private sector* US institutions is much more pronounced. Indeed, the effect of family background (conditional upon high school achievement) is substantially stronger for private than for public sector colleges—both within the United States and when compared to England and Australia. Together this suggests that, although overall socioeconomic inequality within US post-secondary education does not seem to be exceptionally large or small relative to England and Australia, there are nevertheless certain elements that do stand out in comparison to these particular countries.

5. Conclusions

Being able to access high quality college education is thought to be an important determinant of later economic success (Haveman & Smeeding, 2006). Yet young people from working class backgrounds are less likely to attend a high-status university than their more advantaged peers. This paper has examined the extent of socioeconomic inequality in access to high status post-secondary institutions across three developed countries. We have found that although academic achievement in high school is an important reason why high SES groups dominate enrollment at elite colleges, substantial direct effects of family background nevertheless remain. This holds true across Australia, England and the United States, with very similar magnitudes of socioeconomic inequality observed in each.

These findings have important implications for social stratification within post-secondary education. In particular, the fact that we find little cross-national variation, despite substantial differences across these three countries in how higher education is designed, suggests that high SES families will do whatever it takes to seek out qualitative advantages within the system that they face. Indeed, as Bastedo and Flaster (2014) note:

> If the number of applicants to selective colleges increases, high SES students will adapt to the changing landscape of admissions and continue to gain disproportionate access to the most prestigious institutions

Our findings are consistent with this view; high SES families in different countries face very different post-secondary education landscapes, yet this does not seem to significantly alter their ability to dominate high status college enrollment. Rather, they seem to be able to adapt, continuing to use their resources to the greatest possible effect to ensure that educational inequalities are maintained.

The fact that socioeconomic differences in elite *private* college access are particularly pronounced suggests that private sector institutions may have a prominent role in maintaining post-secondary inequalities within the United States. As outlined in section 2, there are many possible mechanisms by which high SES families may gain an advantage in accessing such institutions. For instance, "legacy" rules are particularly prominent within high status private US colleges, with previous research suggesting that this advantage is equivalent to an additional 160 points on the SAT (Espenshade, Chung, & Walling, 2004). Similarly, Bowen et al. (2011) and Grodsky and Jones (2007) note that young people are quite poor at judging the relative costs and benefits of elite versus non-elite colleges, and thus that the high "sticker prices" of elite private colleges could deter disadvantaged children them from applying. Alternatively, elite private college graduates tend to earn more than elite public sector graduates (see Table 1). Consequently, high SES families may have particularly strong economic incentives to ensure their children gain access to a high-status private institution. Relatedly, one might argue that attending a high status private university is simply a more selective outcome—and thus that greater socioeconomic gaps are to therefore be expected.

One should, of course, also recognize the limitations of this study. First, we have considered access only to high-status colleges and not to particular subject groups. In England and Australia, young people apply to study a particular program at a particular institution. Hence, in these countries, students may face a trade-off between college and subject prestige, which we are not capturing in our consideration of institutional quality alone. Second, despite the substantial time and effort the authors have spent harmonizing the ELS, LSAY and LSYPE datasets, one cannot rule out the possibility that some subtle differences remain. A preferable alternative would be for all survey instruments to be harmonized (across a large pool of countries) prior to data collection, similar to the successful Organisation for Economic Co-operation and Development (OECD) PISA project. Indeed, we believe that this paper has illustrated one of a number of interesting questions that a longitudinal PISA study could address, and strongly encourage the OECD to consider this possibility. Finally, the simple decompositions presented

in this paper provide only a first insight into the many complex causal mechanisms driving SES inequality in elite college access. Consequently, although we have found family background to be particularly important for elite private college access in the United States, it has not been possible to identify exactly *why* this is the case. Although we have outlined some possible explanations above, we are unable to conclude which, if any, of these is the driving force. Morgan (2012) suggests that the best approach to establishing the true causal pathways is to directly measure and statistically model the direct family background effect (while also recognizing that very few datasets currently make this possible). Nevertheless developing a better understanding of the relative importance of each of the aforementioned factors, and how they interact with one another, remains an important area for future sociological research.

Despite these limitations, our findings continue to have important implications for public policy. In particular, how might access to high status institutions be improved for well-qualified students from disadvantaged backgrounds? In a time of increasingly scarce financial resources, it is becoming ever more important for public funds to be spent in the right places. A number of leading academics have recently argued that investing in preschool education (Cunha, Heckman, Lochner, & Masterov, 2006; Heckman, Hyeok Moon, Pinto, Savelyev, & Yavitz, 2010) and raising teacher quality (Hanushek, 2011) are the most effective ways to enhance the lifetime opportunities of young people from disadvantaged homes. However, our results indicate that academic ability that has already been developed by children from disadvantaged backgrounds is not being exploited as fully as it could be—particularly with respect to elite college entry. Interventions later in young people's lives are therefore still needed to ensure that socioeconomically disadvantaged children make the most of their potential. These should not just focus upon addressing disadvantaged children's choices and decisions at the point of college entry, but also factors occurring in high school, such as subject choice, counselling and guidance, and the outreach activities of high status institutions. However, it is also important to recognize that, although cost effective interventions of the type suggested by Hoxby and Turner (2013) should no doubt be pursued, their impact may be marginal relative to the extremely large socioeconomic inequalities that persist in post-secondary education. With SES gaps being similarly large across countries with quite diverse education systems, it may be that much more radical changes are needed to equalize young people's educational opportunities.

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Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at http://dx.doi.org/10.1016/j.rssm.2015.06.003

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