

Private schooling, subject choice and upper secondary academic attainment in England

Background

- Although private schools only educate a small proportion of the pupil population at any one time, their influence is extensive
- For example there is a disproportionate representation of privately educated people among judges and other high-status professional occupations, in top political and cultural positions and in high paying jobs (Kirby, 2016; Macmillan et al., 2015 etc.)
- This paper tried to understand some of the mechanisms for this advantage

Background

- At lower secondary, Malacova (2007) shows that there is higher value-added between key stage 3 and GCSEs for those who attend private school compared to state schools
- Ndaji et al (2016) also find a substantial average advantage for private school students, equivalent to nearly two-thirds of the grade per GCSE subject
- Both take into account prior achievement, but not family backgrounds characteristics
- Focus on GCSE (age 16 attainment)

Gaps

- No evidence to our knowledge about the association between school type and educational performance in upper secondary school (sixth form, age 16-18)
- The paper also explores the link between schooling, subjects chosen and the transition to university

Subject choice

- The transition to college carries high stakes for the pupils, because of the established hierarchy of universities and the strong link between high-ranking universities and high-paying influential positions (Britton et al. 2017)
- A level subject choice has been found to make a significant difference to pupils' futures, over and above attainment (Dilnot, 2015; 2018)
- The Russell Group tried to make the preferred A level subjects more transparent by publishing 'Informed Choices' which identified 'facilitating subjects' including 20 modern languages; 3 classical languages; four sciences; three maths subjects; English literature, geography, and history

Research questions

- Are privately educated students in upper secondary schools likely to take more 'facilitating' A levels than state educated students?
- Given the subjects studied at A level, do privately educated students perform better than those educated in state schools?
- Is there a private school advantage for studying at any university or an elite university over and above the subjects studied and grades achieved at A level?

Data Next Steps; a longitudinal cohort of young people in England, born 1989/1990, followed over eight waves spanning 12 years so far, more planned

Method descriptive analyses, rich set of controls to try to account for endogeneity, not causal.

*poisson model for count outcomes (number of subjects studied);

*regression analyses for rank A level score;

*and linear probability models to predict university attendance

Descriptive of those who study A levels
at 16-18, 14.6% are in private school

RQ1 Are privately educated students in upper secondary schools likely to take more 'facilitating' A levels than state educated students?

	Model 1		Model 2		Model 3	
a. Poisson Regression: Predicting number of A Levels studied						
	CoefSE		CoefSE		CoefSE	
Private School 16-18	0.10** (0.03)		0.03 (0.03)		0.00 (0.03)	
Constant	1.28*** (0.01)		0.39** (0.14)		0.41** (0.15)	
Observations	5,852		5,852		5,852	
R2	0		0.19		0.22	
Prior attainment			✓		✓	
Region, Gender, Ethnicity, equivalised hhld income, class, parental ed, tenure					✓	
Standard errors in parentheses; *** p<0.001, ** p<0.01, * p<0.05, + p<0.10						

	Model 1	Model 2	Model 3
b. Poisson Regression: Predicting number of 'facilitating' A Levels studied			
	CoefSE	CoefSE	CoefSE
Private School 16-18	0.63*** (0.04)	0.34*** (0.04)	0.27*** (0.05)
Constant	0.29*** (0.01)	-2.61*** (0.36)	-2.41*** (0.37)
Observations	5,852	5,852	5,852
R2	0.04	0.37	0.4
Prior attainment		✓	✓
Region, Gender, Ethnicity, equivalised hhld income, class, parental ed, tenure			✓
Standard errors in parentheses; *** p<0.001, ** p<0.01, * p<0.05, + p<0.10			

RQ2 Given the subjects studied at A level, do privately educated students perform better than those educated in state schools?

A level rank

- To measure a level attainment, we compute a percentile rank of the young person's A level point score achieved
- We first standardise the a level result by subject, each student is given an average score by taking the total point score by subject and dividing it by the number of modular exams taken for that subject code.
- Each student is allocated a unique rank within that subject which runs from zero to 100
- To compute the overall rank position for students we sum the rank position for the best four subjects studied at A level and then calculate the mean rank

	Model 1		Model 2		Model 3	
	β	SE	β	SE	β	SE
a. OLS Regression Predicting total A level rank						
Private schooling 16-18	0.16***	(0.02)	0.10***	(0.01)	0.08***	(0.01)
Constant	0.48***	(0.00)	0.39***	(0.03)	0.43***	(0.04)
Observations	5,852		5,852		5,852	
R²	0.02		0.28		0.29	
GCSE results			✓		✓	
Region, Gender, Ethnicity, equivalised hhld income, class, parental ed, tenure					✓	

8 percentage points higher in A level ranking – equivalent to the difference between a student with AAB to a student with AAA

	Model 1		Model 2		Model 3	
	β	SE	β	SE	β	SE
b. OLS Regression Predicting 'facilitating' A level rank						
Private schooling 16-18	0.17***	(0.02)	0.12***	(0.02)	0.11***	(0.02)
Constant	0.45***	(0.00)	0.28**	(0.09)	0.30**	(0.09)
Observations	3,903		3,903		3,903	
R ²	0.02		0.27		0.29	
GCSE results			✓		✓	
Region, Gender, Ethnicity, equivalised hhld income, class, parental ed, tenure					✓	

11 percentage points higher in facilitating A level subject ranking – equivalent to the difference between a student with ABB to a student with AAA

RQ3 Is there a private school advantage for studying at any university or an elite university over and above the subjects studied and grades achieved at A level?

Linear Probability Model Predicting University attendance

	Model 1		Model 2		Model 3		Model 4	
	Private school		+ Number of A levels		+ All A level rank		+ Disaggregated facilitating & non-facilitating	
	β	SE	β	SE	β	SE	β	SE
Ref: State schooling								
Private schooling 16-18	0.09**	(0.03)	0.08*	(0.03)	0.07*	(0.03)	0.06*	(0.03)
Constant	0.15*	(0.06)	0.15*	(0.07)	0.22***	(0.07)	0.28***	(0.07)
Observations	5,852		5,852		5,852		5,852	

Controlling for GCSE results; region; gender; ethnicity; equivalised household income; social class background; parental education; housing tenure. Standard errors in parentheses *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, + $p < 0.10$

A few more things to note

- There is a positive association between rank grade A level total and university attendance
- In the model with disaggregated grades (facilitating and non-facilitating shown separately) we see that both the number of facilitating A levels and the ability within the facilitating A levels is positively associated with university attendance
- The number of non-facilitating numbers is negatively associated with university attendance, however the non-facilitating subject rank grade is positively associated with university attendance

Linear Probability Model Predicting Russell Group university attendance

	Model 1		Model 2		Model 3		Model 4	
	Private school		+ Number of A levels		+ All A level rank		+ Disaggregated facilitating & non-facilitating	
	β	SE	β	SE	β	SE	β	SE
Ref: State schooling								
Private schooling 16-18	0.10**	(0.03)	0.10**	(0.03)	0.06+	(0.03)	0.02	(0.03)
Constant	-0.30***	(0.06)	-0.27***	(0.07)	-0.16*	(0.07)	-0.11+	(0.07)
Observations	3,816		3,816		3,816		3,816	

Controlling for GCSE results; region; gender; ethnicity; equivalised household income; social class background; parental education; housing tenure. Standard errors in parentheses *** p<0.001, ** p<0.01, * p<0.05, + p<0.10

A few more things to note on this model

- In the disaggregated model, we see that doing three or more facilitating subjects (compared to none) is associated with a 20% increase of attending an elite university
- Those who are in the 70th percentile of ranked ability or above have a higher probability of attending a Russell Group university

Conclusions

- Those who attend a private school at sixth form do more facilitating subjects than those who attend a state school
- There is some evidence that private school sixth form students do better in their A levels
 - *facilitating subjects by 11 percentage points
 - *and total rank 8 percentage points
- Private school students are 6 percentage points more likely to attend university than state school students over and above subjects taken
- The private school advantage for attending elite universities may be operating through subject choice (and ability within certain subjects)

Thank you to our funders



Any questions?

Linear Probability Model Predicting University attendance

+ Disaggregated facilitating & non-facilitating	
	β SE
Ref: State schooling	
Private schooling 16-18	0.06* (0.03)
Number of facilitating subjects (Ref: None)	
One	0.08* (0.03)
Two	0.10** (0.04)
Three or more	0.15*** (0.04)
Rank grade total facilitating A Levels (Ref: Decile 1)	
Two	0.02 (0.04)
Three	0.07+ (0.04)
Four	0.08* (0.04)
Five	0.06 (0.04)
Six	0.09* (0.04)
Seven	0.10** (0.04)
Eight	0.11** (0.04)
Nine	0.11** (0.04)
Ten	0.08* (0.04)

Number of non-facilitating subjects (Ref: None)	
One	-0.13*** (0.04)
Two	-0.10** (0.04)
Three or more	-0.05 (0.04)
Rank grade total non-facilitating A Levels (Ref: Decile 1)	
Two	0.06 (0.04)
Three	0.12*** (0.04)
Four	0.15*** (0.04)
Five	0.14*** (0.04)
Six	0.19*** (0.04)
Seven	0.16*** (0.04)
Eight	0.15*** (0.04)
Nine	0.17*** (0.04)
Ten	0.18*** (0.04)
Constant	0.28*** -0.07
Observations	5,852

Linear Probability Model Predicting Russell Group university attendance

	+ Disaggregated facilitating & non- facilitating	
	β	SE
Ref: State schooling		
Private schooling 16-18	0.02	(0.03)
Number of facilitating subjects (Ref: None)		
One	-0.01	(0.03)
Two	0.05	(0.04)
Three or more	0.20***	(0.04)
Rank grade total facilitating A Levels (Ref: Decile 1)		
Two	0	(0.04)
Three	-0.01	(0.04)
Four	-0.03	(0.04)
Five	-0.03	(0.04)
Six	0.05	(0.04)
Seven	0.08*	(0.04)
Eight	0.17***	(0.04)
Nine	0.15***	(0.04)
Ten	0.15***	(0.04)
Number of non-facilitating subjects (Ref: None)		
One	0.02	(0.04)
Two	0.02	(0.04)
Three or more	0.04	(0.04)
Rank grade total non-facilitating A Levels (Ref: Decile 1)		
Two	-0.08*	(0.04)
Three	-0.05	(0.04)
Four	-0.08*	(0.04)
Five	-0.05	(0.04)
Six	-0.06	(0.04)
Seven	0.01	(0.04)
Eight	0.05	(0.04)
Nine	0.06	(0.04)
Ten	0.07	(0.04)
Constant	-0.11+	(0.07)
Observations		3,816