



Using the Scottish Longitudinal Survey to analyse social inequalities in school subject choice

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The AQMeN Education and Social Stratification research

Main aim of the Education research strand is:

 to provide a better understanding of the mechanisms through which social inequalities in education affect individuals' education and labour market outcomes

Currently six research projects (e.g. curriculum choices, HE retention, education systems and labour market pathways)

 One of them is on social inequalities in school subject choices and how these inequalities affect social class differentials in entry to higher education and in occupational destinations



Rationale for our research

- Most UK studies on social inequalities in education concentrate on attainment differences
- Focus of international literature
 - Selection into different school tracks (early tracking), e.g. academic vs. vocational
 - Less attention paid to within-school curriculum differences
- Flexible choice of type and number of secondary school subjects in Scotland (and more generally in the UK)
- Eight subjects (English, languages, maths, history, physics, chemistry, biology and geography) 'facilitate' access to Russell Group universities (Russell Group Dossier, 2011)



Social origin and subject choice

- Flexible decision-making of students and parents
 more leeway for social class differences
 - Students from lower social origin may lack confidence to succeed >
 choose less demanding/smaller number of subjects
 - Students from higher social origin with stronger interest in 'academic' subjects, more family support and less fear of failure → choose more demanding/higher number of subjects
- 'Facilitating' subjects required in HE admission → leads to socially selective subject choices
 - Students from higher social origin need to maintain their status → take subjects required for admission into prestigious universities
 - Students from lower social origin may be less familiar with HE requirements and the importance of certain subjects
- Students from higher social origin choose more often subjects that lead to HE and more prestigious universities



Secondary school curriculum in Scotland

Curriculum characteristics

- no compulsory subjects (exception: English and Maths in S3/S4)
- no restriction in terms of numbers
- Choice of different levels (S3/S4: Access 1-3, Standard Grade, Intermediate 1; S5/S6: Intermediate 2, Highers, Advanced Highers); New qualifications, National 1-5, were introduced in 2014
- Subject choice in S3/S4 no statutory requirement for S5/S6



The SLS data

- SLS sample used for the study
 - passed through the school stages S3-S6 or S4-S6 in 2007-2010
 - who were present during census 2001 and for whom father and/or mother could be identified
- Education data include school census information, SQA attainment data and attendance data
 - SQA attainment data include full information on subject choices, levels and performance
- Census data provide information on pupils' family, housing and neighbourhood characteristics at age 9/10
- Total number of cases: 4944
- Data analysis in safe setting place at NRS, Edinburgh



Variables (I)

- Pupils' social origin at age 9/10 (census information)
 - Parental class (NS-SEC), 1) routine occupations, 2) semi-routine occupations, 3) lower supervisory and technical occupations, 4) small employers and own account workers, 5) intermediate occupations 6) lower managerial and professional occupations, 7) higher managerial and professional occupations, dominance principle
 - Parental education, 1) parents with no qualifications, 2) at least one parent with Standard Grades, 3) one parent with Highers, 4) both parents with Highers, 5) one parent with degree, 6) both parents with degree
 - Housing tenure: public/social housing vs. rented/home owner
 - Number of siblings
- Pupils' gender and ethnicity (school census information)

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Variables (II)

- Subject choice in S3/S4 and S5/S6 (SQA information)
 - English
 - Maths
 - Science (Biology, Chemistry, Physics)
 - Languages (French, German, Spanish, Italian, etc.)
 - Cultural subjects (History, Geography, Modern studies, Classical studies, Arts, etc.)
 - Other subjects (e.g. accounting, craft and design, home economics)
- Attainment in subjects chosen (SQA information)
 - Number of subjects
 - Level of difficulty (Access 1-3, Standard Grade, Intermediate 1 or 2, Highers, Advanced Highers)
 - Performance ("not passed", "D/Grade 7", "C/Grade 6", "C/Grade 5", "B/Grade 4", "B/Grade 3", "A/Grade 2" and "A/Grade 1")



Variables (III)

Table 1: Unified Points (UCAS points) Score Scale

Score	Access 3	Standard Grade	Intermediate 1	Intermediate 2	Highers	Adv. Highers
120						Α
100						В
80						С
72					Α	D
60					В	
48					С	
42				Α	D	
38		A/1				
36						
35				В		
28		A/2		С		
24			Α	D		
22		B/3				
20			В			
16		B/4	С			
12			D			
11		C/5				
8	Pass	C/6				
3		D/7				

Source: http://www.scotland.gov.uk/Publications/2010/03/22111037/4



Outcomes

Subject choice

Dependent variable: binary subject dummies → logistic regressions

Attainment

- Dependent variable: standardised unified point score in each subject group → OLS regressions
 - Conditional on having sat the subject



Research question 1

Are subject choices in S3-S4 dependent on social origin?



RQ1: Results summary

 There is a clear social divide in the probability to take 'facilitating subjects' (science, languages, cultural subjects) and 'non-facilitating subjects' (other: technical, business, vocational) in S3-S4

 Parental education is a stronger predictor of subject choice than parental class at this stage



RQ1 Results

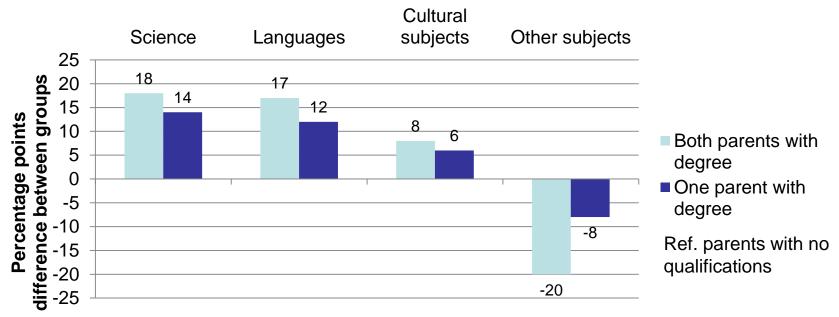
Table 2: Uptake of subjects in S3/S4 by parental class and education

	Science	Language	Cultural subj.	Other subj.
Class of origin (%)				
Routine occupations	75	58	87	88
Intermediate occupations	90	81	96	89
Higher managerial and professional	97	88	98	76
Parental education (%)				
Parents with no qualifications	70	61	83	87
At least one parent with Standard Grades	83	73	92	90
One parent with Highers	91	79	96	89
Both parents with degree	98	89	99	67





Figure 1: Percentage point differences in the probability of choosing subjects in S3/S4 between students with both parents or one parent with a degree and students with parents with no qualifications (average marginal effects)



Source: Scottish Longitudinal Study (SLS), own calculations. Note: controlling for gender, ethnicity, no. of siblings, parental social class and housing tenure.

→ Social divide between 'facilitating subjects' (science, languages, cultural subjects) and 'non-facilitating subjects' (other: technical, business, vocational)



Research question 2

Do students from different social origins vary in their attainment in subjects chosen in S3/S4? Do attainment gaps vary across subjects?



RQ2: Results summary

- There are significant social origin differences in attainment in all subjects
- These differences are particularly pronounced in English and Languages, followed by Maths and Cultural Studies
- Again, parental education effects are stronger than parental class effects



RQ2 Results

Table 2: Attainment (standardised unified point score) gap in S3/S4 by social origin

	English	Maths	Science	Lang.	Cultural	Other
Parental class (ref. routine occ.)						
Lower managerial and professional	0.22***(0.05)	0.22***(0.05)	0.05 (0.03)	0.09*(0.04)	0.12**(0.04)	0.13***(0.03)
Higher managerial and professional	0.30***(0.05)	0.39***(0.06)	0.11*(0.03)	0.22***(0.05)	0.24***(0.04)	0.19***(0.04)
Parental education (ref. no qual.)						
One parent with degree	0.45***(0.04)	0.24***(0.05)	0.17***(0.03)	0.33***(0.04)	0.24***(0.04)	0.22***(0.03)
Both parents with degree	0.75***(0.06)	0.41***(0.06)	0.27***(0.04)	0.49***(0.05)	0.41***(0.04)	0.28***(0.04)
Housing tenure (ref. rented/home owner)						
Social housing	-0.19***(0.03)	-0.18***(0.03)	-0.07***(0.02)	-0.17***(0.03)	-0.11***(0.02)	-0.15***(0.02)
N	4319	4316	3979	3508	4282	3886

Source: Scottish Longitudinal Study (SLS), own calculations. Notes: controlling for number of subjects and level of difficulty chosen; standard errors in parentheses; $^*p < 0.05$, $^{**}p < 0.01$



Research question 3

Are subject choices in S5/S6 dependent on social origin?



RQ3: Results summary

- The findings on subject choice in S3/S4 are mainly reproduced in S5/S6
- Subject choices in S5/S6 more dependent on parental class than subject choices in S3/S4
- Strong social inequalities in the choice of English and Maths in S5/S6 (compulsory in S3/S4)



RQ3 Results

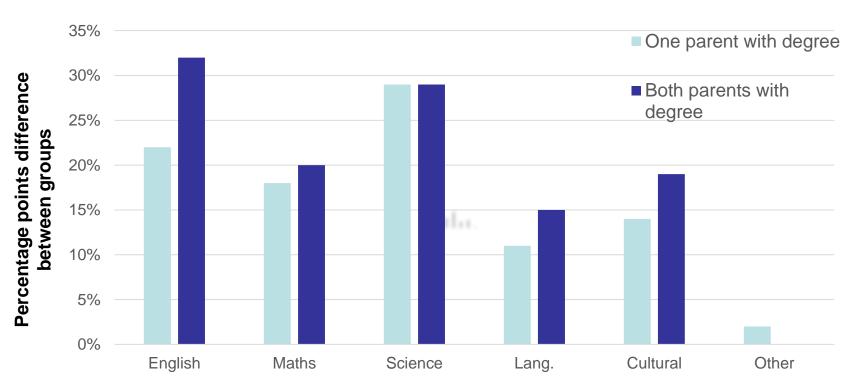
Table 3: Uptake of subjects in S5/S6 by parental class and education

	English	Maths	Science	Language	Cultural	Other
Class of origin (%)						
Routine occupations	48	40	31	7	45	48
Intermediate occupations	76	64	49	16	66	64
Higher managerial and professional	87	74	66	20	74	57
Parental education (%)						
Parents with no qualifications	45	38	25	5	43	51
At least one parent with Standard Grades	61	50	39	9	56	61
One parent with Highers	72	63	47	14	65	62
Both parents with first degree	91	74	67	24	78	51



RQ3 Results

Figure 2: Percentage point differences in the probability of choosing subjects in S5/S6 between students with both parents or one parent with a degree and students with parents with no qualifications (average marginal effects)



Source: Scottish Longitudinal Study (SLS), own calculations. Note: controlling for gender, ethnicity, no. of siblings, parental social class and housing tenure.



Research question 4

To what extent are social inequalities in subject choices in S5/S6 explained by subject choices in S3/S4?

Are there remaining social origin differences which cannot be explained by previous subject choices and attainment?



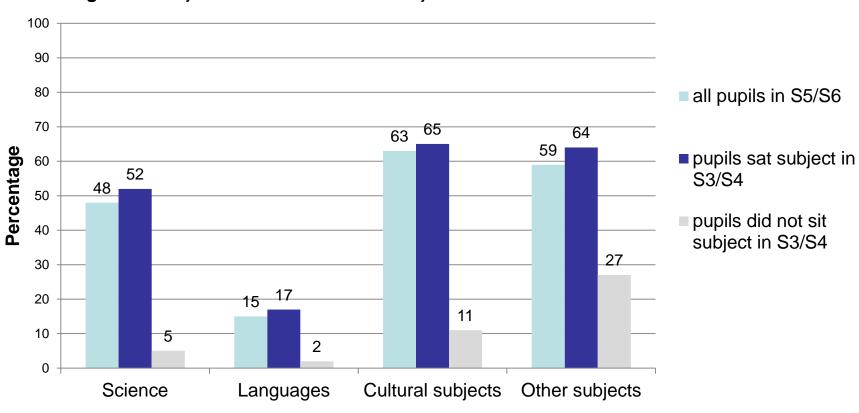
RQ4: Results summary

- Social inequalities in subject choices in S5/S6 strongly explained by subject choices in S3/S4
- Previous subject choice is a stronger mediator than previous attainment
- With the exception of English, no significant net effects of social origin on subject choices in S5/S6 were found once controlling for previous subject choice and attainment within subjects



RQ4 Results

Figure 3: Subject choice in S3/S4 and subject choice in S5/S6



Source: Scottish Longitudinal Study (SLS), own calculations.



Summary

- RQ1: Strong social inequalities in subject choices in S3/S4
 - Science/Languages/Cultural vs. Other (Business, Technical, Vocational) subjects
 - Parental education more important than parental class
- RQ2: Significant attainment gaps in all subjects
 - Particularly pronounced in English and Languages
- RQ3: Subject choice in S3/S4 strong predictor of subject choice in S5/S6 → strong mediator of social origin differences of later subject choices
- RQ4: Modest effects of social origin on subject choices in S5/S6 once accounting for previous subject choices and attainment



Disclaimer

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