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A note on subject choice at age 14 and socio-economic inequality in access to university

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Abstract

Over the past twenty years governmental efforts to promote social mobility have included widening access to higher education as a major focus. This is in an attempt to give more individuals the opportunity to benefit from the economic returns to a university degree (Walker and Zhu, 2011). Despite this, there remains a significant level of socioeconomic inequality in access to universities (Anders, 2012a; Boliver, 2013; Chowdry et al., 2013). Much of this inequality is explained by, or emerges through, differences in prior attainment at age 16.

Non-technical summary

This note adds to this literature by exploring whether the differences are remaining socioeconomic difference is explained further by the subjects that young people studied between ages 14 and 16. There are significant differences in the subjects that young people study depending upon their background (Henderson et al., 2016), suggesting that this could be a relevant factor.

We apply the statistical technique of regression modelling to rich survey data from 'Next Steps' for a recent cohort of young people in England to explore this issue. This allows us to estimate the extent of socioeconomic inequality before and after taking into account differences in subjects studied between ages 14 and 16.

Our results replicate previous findings of socioeconomic inequality in entry to university after conditioning on prior attainment at ages 11 and 16. Adding in controls for the subjects studied from ages 14 to 16 explains a small but significant proportion of these remaining socioeconomic differences in entry to university, as well as to highly-competitive institutions.

Our findings suggest that if young people from different socioeconomic backgrounds were studying a more similar curriculum between ages 14 and 16 it would be unlikely to make much of difference to the inequality in university entry highlighted by previous studies. This does not mean that ensuring pupils have the same opportunities to choose their curriculum post-14 regardless of their background is not important. However, we certainly should not regard reforms in this space as any kind of 'silver bullet' for improving university access.

Introduction

Over the past twenty years governmental efforts to promote social mobility have included widening access to higher education as a major focus. This is in an attempt to give more individuals the opportunity to benefit from the economic returns to a university degree (Walker and Zhu, 2011). Despite this, there remains a significant level of socio-economic inequality in access to universities. Previous analyses using multiple sources of data have established that much of this gap in enrolment is explained by prior academic attainment (Chowdry et al., 2013) and by differences in application behaviour (Anders, 2012a) but that there remain some differences, particularly in access to highly competitive universities (Boliver, 2013).

This note contributes to the literature by exploring a factor that may explain the remaining gap, at least in part. Specifically, it explores whether differences in the subjects that individuals from different backgrounds study between ages 14 and 16 explain some or all of the remaining gap. It does not discuss the direct influence of studying particular subjects on the probability of attending university. This is covered in a separate paper employing matching techniques to this end.

By and large, England has a system of within, rather than between, school curricula differences. This is associated with smaller socioeconomic differences in the curricula that individuals take (Chmielewski, 2014). Nevertheless, there are significant differences in the subjects that young people study depending upon their background (Henderson et al., 2016). We consider subject choices at this point in time because, in the English context, it is the first time that individuals get to express a preference for the subjects they study, although we note in previous work that these choices may be shaped by the school at which they are studying (Anders et al., 2016b).

We use data from a large, representative, longitudinal survey (Next Steps) in order to explore this issue. The data are rich in young people's background characteristics, as well as details of their academic career, including subjects studied during this period and whether they enter university. Participants turned age 14 (the point at which they make the subject choices we consider) in 2004-05, finished compulsory education at age 16 in 2006-07, and reached age 18 (therefore being in a position to start university) in 2008-09.

Our results replicate previous findings of socioeconomic inequality in entry to university after conditioning on prior attainment at ages 11 and 16. Adding in controls for the subjects studied from ages 14 to 16 explains a small but significant proportion of this remaining gap. Similar results emerge when we explore inequality in entry to highly competitive universities.

Background

In their analysis of administrative data (National Pupil Database records linked to data from the Higher Education Statistics Authority), Chowdry et al. (2013) find large socio-economic inequality in university attendance. They find that that individuals of the top fifth of their sample are more than 40 percentage points (% pts.) more likely

to start university than those in the least advantaged fifth, with larger gaps towards the upper end of the distribution. They also find differences of more than 30% pts, in the probability of attending a high-status university between the same groups. They go on to find that much of this difference is explained by attainment that emerges earlier in the education system.

However, while this use of administrative datasets has clear advantages, the relative weaknesses of socio-economic measures available may mean this analysis understates inequality on this basis. Other work using survey data with richer information on socio-economic status has found that some socio-economic inequality in the probability of attending university remains even after prior attainment is controlled for, although much may be explained by differences in application behaviour (Anders, 2012a). Work by Boliver (2013) suggests that some differences in university entry may remain, although this analysis of Universities and Colleges Admissions Service (UCAS) data is only able to control for prior attainment at age 18, not earlier in the education system.

Taken together, there is evidence of residual inequality in university entry (and entry to high-status institutions) although the point during young people's educational careers where this emerges is not clear. As such, it seems relevant to consider other potential mechanisms through which this might be happening. In this note, we explore the importance of differences in subjects that individuals study as one such mechanism.

The importance of the subjects that young people study while at school for their chances of progressing to Higher Education (HE), in general, and highly selective HE institutions, in particular, has increasingly attracted the attention of policymakers (Gibb, 2011). The policy attention stems from a concern that young people are making subject choice decisions (or being channelled towards decisions) that are reducing the probability of participating in Higher Education and that this is more likely to be the case for those from less advantaged backgrounds.

Indeed, previous work has suggested that when high achieving young people from less advantaged backgrounds are provided with more information on how best to prepare for university applications their decisions improve (Borghans et al., 2013; Hoxby and Turner, 2013). Although these previous studies cited did not specifically cover advice about subject choice, there is a similar logic of improving educational decisions in our setting. Indeed, previous research has highlighted that choosing the 'wrong' curriculum at this point may have long term consequences in terms of occupational status acquisition (Iannelli, 2013); educational progression seems one plausible mechanism for this. In a different context, evidence from Belgium suggests that subject choice has an influence on the gender gap in the labour market (Duquet et al., 2010).

In England, age 14 is the first point at which young people have a direct choice about the curriculum they receive, although there is some earlier indirect influence through secondary school choice (Anders et al., 2016b). It is also a point at which all young people are still in compulsory education for two more years. As such, it seems a sensible period of time in which to study the decisions and subsequent actions of young people. Unlike studying post-16 subject choices, there remains something of a common core to the curriculum, allowing a focus on how choices about non-compulsory subjects seem to affect future plans.

However, previous work has highlighted that there are important and complex patterns in the subjects that individuals study during this age range (Henderson et al.,

2016; Anders et al., 2016b). Three particularly important characteristics in explaining subject choices at this age are gender (Bell, 2001; Francis, 2000; Jin et al., 2011; Sullivan et al., 2010; Henderson et al., 2016), prior attainment (Davies et al., 2008; Jin et al., 2011; Henderson et al., 2016) and socioeconomic background (Davies et al., 2008; Jin et al., 2011; Henderson et al., 2016). Previous work has considered the proximal influence of subject choice post-16. For example, in their exploration of racial inequality in university entry, Noden et al. (2014) note that differences in subject of study post-16 appear to affect university entry.

However, since subjects available to individuals at age 16 often depend on those that have studied before this point, it is of interest to explore whether there are consequences of subject choices at age 14 that flow through to these same later outcomes. In particular, in this note we explore whether these overlapping socio-economic inequalities in young people's subject choices and their university attendance interact in our research question, to what extent do socioeconomic differences in the subjects that individuals study from ages 14 to 16 account for residual inequality in university attendance?

Data and descriptives

We use Next Steps (a representative longitudinal survey formerly known as the Longitudinal Survey of Young People in England) in order to explore these questions. Next Steps follows a cohort of young people born in 1989-90 from age 14 through to age 20. The survey has a clustered design based around schools, so that young people are randomly selected for inclusion within randomly selected schools (albeit with some oversampling). It includes annual interviews throughout with the young people themselves, interviews with their parents (for the first four years), and linked administrative data about young people's academic attainment (from the National Pupil Database, discussed below). Using the responses from the parental questionnaires it provides high quality data on young people's socio-economic background, based on questions about family income, parental education, and occupational status.

Importantly for this work, it also includes self-reported information on subjects that young people are studying at age 14 (academic year 2004/05-2005/06). These include traditional academic subjects such as History, Geography, Foreign Languages, and Music but also applied subjects such as Hospitality, Leisure, and Health and Beauty. For descriptive purposes, we also develop an overall, continuous measure of the academic selectivity of the subjects that a pupil studies from age 14-16, based on the prior academic performance of the pupils that choose to study each subject, described further in (Henderson et al., 2016). A maximum of eight subjects are used to create this measure in order to stop individuals taking a large number of low-selectivity subjects ending up with a high selectivity score. This follows the logic used in the construction of 'capped' GCSE points scores. Thus, individuals who take a combination of academically selective subjects end up with a high score, while individuals who take a combination of less selective subjects are assigned a low score. For ease of interpretation, we standardise this score among the analysis sample, so that it has a mean of zero and a standard deviation of one.

We consider the importance of studying the full set of subjects required to be eligible for the English Baccalaureate (EBacc). For a pupil to count towards their school's EBacc measure they must achieve a C grade or above (often referred to as a 'good

pass') in the following GCSE subjects: English, Mathematics, History or Geography, two sciences and a Modern or Ancient Language. However, the introduction of this performance measure comes after the cohort we consider took their GCSEs. This strengthens our approach since it eliminates the possibility that individuals took these subjects specifically in order to achieve the EBacc, which may increase any selection issue; constructing an indicator of studying EBacc-eligible subjects artificially for this cohort should give us a cleaner estimate of whether studying the required subjects improves university entry chances in and of itself. We construct a binary measure according to whether pupils study the full set of subjects that would make them eligible for the EBacc if they a) go on achieve at least a grade C in all of them and b) were in a later cohort when the measure had been introduced. We find that one third of the sample studied subjects that would have make them eligible for the EBacc in later years.

We also consider whether individuals studied for any applied GCSEs. These were introduced in the 2002 Education Act, as part of a policy to increase the diversity of the 14-19 curriculum. However, this policy has since been criticised, with some of these qualifications having their equivalence to GCSEs in performance tables downgraded since this period. 42% of the sample took at least one applied GCSE; those who did so tended to be less advantaged and have lower prior attainment than those who did not.

Wave 7 of Next Steps covers young people aged 19-20. Hence the data allow us to model the entry to university through what might be thought of as the 'traditional' route, going from sixth form or further education college to university, either the same year or after a single gap year. While this includes the majority of those who attend university, the exclusion of a potentially interesting subpopulation should be noted; in particular, results could be affected if subjects studied at GCSE are associated with late entry to university. We also consider entry to a Russell Group institution; the Russell Group is a group of 20 research-intensive UK institutions,1[1] which are often considered to be amongst the most prestigious universities in the UK.

Next Steps includes a rich set of data with which to measure young people's socioeconomic status (SES), including household income, parental education, and parental occupational status, all of which are important in measuring SES (Hauser, 1994). Household income is measured at each wave between 1 and 4. As previous research has suggested 'permanent' income (rather than transitory income) has a much larger effect on young people's educational outcomes (Jenkins and Schluter, 2002, p.2), an approximation of the household's equivalised 'permanent' income is made by averaging across these four measures and dividing by the square root of household size. Previous work suggests that Next Steps underestimates household income to some extent, relative to social surveys where it is a major focus (Anders, 2012b).

Parental education also captures an important aspect of socioeconomic status, with one explanation for this being that it "may alter the 'productivity' of [parents'] time investments in children" (Ermisch and Pronzato, 2010, p.1). Whatever the explanation, a number of studies have found evidence of a causal impact of parents' education on children's educational outcomes (Chevalier, 2004; Ermisch and

[1] The Russell Group has since increased in size but for the individuals in the cohort considered it consisted of the following 20 universities: University of Birmingham, University of Bristol, University of Cambridge, Cardiff University, University of Edinburgh, University of Glasgow, Imperial College London, King's College London, University of Leeds, University of Liverpool, London School of Economics and Political Science, University of Manchester, Newcastle University, University of Nottingham, University of Oxford, Queen's University Belfast, University of Sheffield, University of Southampton, University College London and University of Warwick

Pronzato, 2010; Havari and Savegnago, 2014), making it an important factor to take into account. Similarly, social class is seen by sociologists as a key element of an individual's SES (Goldthorpe and McKnight, 2004), in particular as "young people (and their families) have, as their major educational goal, the acquisition of a level of education that will allow them to attain a class position at least as good as that of their family of origin" (Breen and Yaish, 2006, p.232). Parents' occupational status is recorded in Next Steps using the National Statistics SocioEconomic Classification (NS-SEC), which was designed to capture social class differences between the different occupational types (Rose and Pevalin, 2001).

The above measures are combined using principal components analysis with a polychoric correlation matrix (Olsson, 1979; Kolenikov and Angeles, 2009) to construct a single index of SES. Alternative methods, such as factor analysis, yield very similar results. This explains roughly three quarters of the variation in the three individual measures, but provides a broader measure of family circumstances than any one measure would provide. Table 1 reports the characteristics of the median member of quintile groups of this SES index.

The upper panel of Table 2 reports differences in subjects studied by socio-economic status as captured through the measures discussed above. Individuals in the highest quintile group of socioeconomic status are studying a mix of subjects over half a standard deviation higher more academically selective than their peers in the least advantaged quintile group. More than half of this most advantaged group study the full set of subjects required to be eligible for the English Baccalaureate (EBacc), compared to only 13% of the least advantaged fifth. By contrast, only just over a quarter of the most advantaged group study at least one applied subject, compared to 60% of the least advantaged group.

The lower panel of the same table demonstrates that there are large differences in university application and attendance by socio-economic status. Under a fifth of the least advantaged group go on to attend university, compared with just under 70% of the most advantaged fifth. Similarly, while only 2% of the least advantaged fifth obtain a place at a Russell Group institution, almost a quarter of those in the most advantaged fifth do so. These findings are in line with previous work on inequality in access to university, whether by household income (Anders, 2012a) or other aspects of socioeconomic status (Boliver, 2013).

Table 1: Median family characteristics by quintile group of socioeconomic status index

Quintile group	Q1	Q2	Q3	Q4	Q5
Parental Education	< A*-C GCSE	A*-C GCSE	A Level	HE < Degree	Degree
Occupational Status	Routine occupations	Routine occupations	Intermediate occupations	Higher occupations	Higher occupations
Family Income (£p.a.)	5,830	9,780	13,286	16,618	29,910
N	1,680	1,525	1,580	1,618	1,602

Notes: Adjusted using LSYPE-provided Wave 7 survey design, attrition and non-response weights. Family income is equivalised by dividing by the square root of household size. Sample: Wave 7 respondents with non-missing data on university attendance, constituent socioeconomic indicators, subject choice variables, and prior attainment data.

Table 2: Differences in subjects studied and proportions applying to and attending university by socioeconomic status

Subject	Q1	Q2	Q3	Q4	Q5	Q1-Q5 Diff.
Academic Selectivity Score	-0.34	-0.13	-0.03	0.18	0.34	0.68
EBacc-eligible subjects	0.13	0.20	0.24	0.37	0.51	0.38
Applied subjects	0.60	0.53	0.48	0.40	0.27	-0.33
Outcome	Q1	Q2	Q3	Q4	Q5	Q1-Q5 Diff.
Attend University	0.19	0.24	0.32	0.47	0.68	0.49
Attend Russell Group	0.02	0.03	0.05	0.11	0.24	0.22

Notes: Adjusted using Next Steps-provided Wave 7 survey design, attrition and non-response weights. Sample: Wave 7 respondents with non-missing data on university attendance, constituent socioeconomic indicators, subject choice variables, and prior attainment data.

Method

We use linear probability regression models (calculating heteroskedasticity- and school cluster-robust standard errors) to estimate the relationship between socioeconomic status, subjects studied, and university attendance (and, separately, attendance of a highly competitive university, specifically a member of the research-intensive Russell Group). While the problems of linear probability models are well-known, these are used rather than probit or logistic binary choice regression models in order to ensure comparability across the models (Mood, 2010). Nevertheless, a similar narrative emerges if we use binary choice models instead.

Our first model (M0) includes only dummy variables indicating the quintile group of SES described in Section 3. This replicates the descriptive findings from that section, providing a 'raw' SES gap in university attendance. Furthermore, these results provide a baseline against which to judge the reduction in inequality we see when additional characteristics are added to the model. From this starting point, we estimate sequential models that highlight the overall level of socioeconomic inequality in university attendance and how much of this is explained by inequality at various points through the education system. These covariates may be thought of as 'transmission mechanisms' between SES and university attendance: to the extent that they are socially graded, their inclusion will reduce the 'raw' SES gap and provide insight on the routes through which those from more advantaged backgrounds end up being more likely to attend university.

Our first model of substantive interest (M1) adds a selection of individual- and school-level demographic characteristics that may be relevant to the relationship. These include categories of ethnicity, month of birth, government office region, number of siblings, number of older siblings and school type variables. The second and third models add individuals' prior attainment (captured using individuals scores in national tests) at age 11 (M2) and age 16 (M3). As previously noted, previous studies have found that scores in these tests explain a large proportion of the SES difference (Chowdry et al.,2013; Anders, 2012a). Nevertheless, we expect a gap to remain.

Our fourth and final model (M4) attempts to capture the importance of subjects studied between ages 14 and 16. To this end, the model includes binary indicators of

each of the subjects measured in the dataset along with an additional binary indicator of whether an individual studies a full set of English Baccalaureate subjects, which previous work indicates may have a particular association with university attendance (Anders et al., 2016a). This EBacc indicator may be thought of as a kind of interaction, capturing the additional change in probability of attending university from having the full set of subjects beyond each individual one.

It is important to discuss the relationship between these subject measures and other variables in the model. In particular, these are the subjects in which we are capturing performance at age 16 in M3. As such, if the difficulty of the subjects also varies, subject of study could, therefore, affect performance at age 16. This could understate the importance of, for example, subjects that are both helpful for university access and more difficult to achieve high scores in. However, this issue should not affect the interpretation of socioeconomic differences in university attendance, which are the focus of this note, once both of the correlations have been have been controlled for.

Results

We report results separately for university attendance (Table 3) and Russell Group attendance (Table 4). Each reports predicted probabilities of attendance by an individual's quintile group of SES, along with the difference between the predicted probabilities between the top and bottom quintile groups. Furthermore, for each model after the first we report the reduction in this difference relative to the previous model and the statistical significance of the decrease in the gap, relative to a null hypothesis of no change.

Table 3: Regression model of university attendance

	M0	M1	M2	M3	M4
SES predicted proportions					
Q1	0.19	0.19	0.28	0.35	0.35
Q2	0.24	0.26	0.28	0.30	0.30
Q3	0.32	0.33	0.33	0.32	0.33
Q4	0.47	0.47	0.44	0.41	0.41
Q5	0.68	0.65	0.57	0.52	0.50
Q5-Q1	0.49	0.46	0.29	0.17	0.15
P > |F|	0.00	0.00	0.00	0.00	0.00
Reduction in Q5-Q1	-	0.03	0.18	0.12	0.02
P > |F|	-	0.04	0.00	0.00	0.00
Other variables in model					
Demographics		√	√	√	√
Age 11 attainment			√	√	√
Age 16 attainment				√	√
Subjects studied 14-16					√
N	7491	7488	7488	7488	7488
Adj. R^2	0.13	0.21	0.30	0.37	0.39

Notes: Weighted using Next Steps-provided design and attrition weights. Inference testing conducted using heteroskedasticity- and school cluster-robust standard errors (reported in parentheses, where relevant). Q5-Q1 reports the difference between lowest and highest quintile groups; P>|F| reports statistical significance of a joint test of all quintile groups. Reduction in Q5-Q1 reports this relative to the model to the left; P>|F| reports statistical significance of this reduction.

We also report the adjusted R2 of the model which provides us information on the additional proportion of variance in university attendance explained by the

introduction of the additional characteristics. R2 is meaningful in linear probability models and may be interpreted as the difference between the average predicted probability between the groups for whom the outcome is and is not realised (Groneau, 1998). We use adjusted, rather than unadjusted, R2 to take into account the large number of additional covariates added to the model when accounting for subject choices.

We begin by discussing the results for predicting university attendance in Table 3. The results for M0, in the first column, replicate those reported in 2. There is a 49%pt. difference in university attendance between the most and least advantaged fifths of the sample. Our first model including individuals' demographic characteristics and a selection of school-level covariates explains a significant proportion of variation in university attendance but makes little difference to the gap between the least and most advantaged groups: the reduction is only three percentage points.

Next, we begin to include prior attainment in our models, which we expect to explain a much larger proportion of the gap in university attendance associated with SES. Beginning with age 11 attainment (M2), we find that the difference between the most and least advantaged quintile groups is reduced to 29%pts., a reduction of 18% pts. This is a statistically significant reduction in the socioeconomic status once prior attainment to this point has been taken into account. Next, adding attainment at age 16 (M3), we see a further significant reduction in the SES gap once this prior performance has been accounted for. The difference in probability of attending university between the top and bottom quintile groups is, this time, reduced to 17% pts. Thus far, this has replicated previous work, finding that socioeconomic inequality in access to university is, in significant part, explained by young people's prior academic attainment but that there remain significant differences, even once these have been taken into account.

Finally, we consider whether the picture changes when the subjects that individuals study are taken into account (M4). There is only a small increase in adjusted R2 when these indicators are added to the model. Nevertheless, there is a small but statistically significant narrowing of inequality (two percentage points), driven by a reduction in the conditional probability of attending university among the most advantaged quintile group. This suggests that, at most, changes in the subjects that individuals study between these points in time can make, at most, only a small difference to narrowing socioeconomic differences in university going.

Next, we repeat the analysis this time considering probability of attending a highly-competitive Russell Group university. Again, M0 replicates the descriptive differences reported in Table 2. Overall, the levels are much lower, however there are still big differences, with those in the most advantaged fifth 12 times (22 %pts.) more likely to attend one of these high-status universities than their peers in the bottom SES quintile group.

Table 3: Regression model of Russell Group attendance

	M0	M1	M2	M3	M4
SES predicted proportions					
Q1	0.02	0.03	0.06	0.08	0.08
Q2	0.03	0.04	0.05	0.05	0.06
Q3	0.05	0.05	0.05	0.05	0.05
Q4	0.11	0.10	0.09	0.08	0.08
Q5	0.24	0.22	0.19	0.18	0.17
Q5-Q1	0.22	0.19	0.13	0.10	0.09
P > |F|	0.00	0.00	0.00	0.00	0.00
Reduction in Q5-Q1	-	0.04	0.06	0.03	0.01
P > |F|	-	0.00	0.00	0.00	0.00
Other variables in model					
Demographics		√	√	√	√
Age 11 attainment			√	√	√
Age 16 attainment				√	√
Subjects studied 14-16					√
N	7481	7478	7478	7478	7478
Adj. R^2	0.08	0.13	0.16	0.18	0.19

Notes: Weighted using Next Steps-provided design and attrition weights. Inference testing conducted using heteroskedasticity- and school cluster-robust standard errors (reported in parentheses, where relevant). Q5-Q1 reports the difference between lowest and highest quintile groups; P>|F| reports statistical significance of a joint test of all quintile groups. Reduction in Q5-Q1 reports this relative to the model to the left; P>|F| reports statistical significance of this reduction.

Including demographic characteristics (M1) makes a slightly larger relative difference in the case of inequality in access to a high-status university, suggesting these ethnicity and school type measures may partly explain the raw SES differences we report. However, as with university access more generally, a big proportion inequality in access to high-status universities is explained by performance in tests at age 11 (M2). The gap between the most and least advantaged quintile groups narrows by 6%pts. (Just under a third of the remaining gap) when this is taken into account. This narrows by a further three percentage points once performance at age 16 are taken into account (M3). So far, all of these reductions have been statistically significant but have left significant remaining inequality.

Finally, we consider the difference made by subjects studied (M4). Again, the broad picture is of a small but statistically significant reduction in inequality in attending a highly competitive university. As with inequality in attending any university, this leaves a significant proportion of inequality explained by the factors included in the model.

Conclusions

In this note, we have explored the relationship between socioeconomic status, subjects studied from ages 14-16, and university attendance (including attendance of highly competitive universities). This brings together previous research on both the socioeconomic correlates of subject choice (Henderson et al., 2016) and inequality in access to university Anders (2012a); Boliver (2013); Chowdry et al. (2013) in England.

We provide new evidence on whether subjects of study during this period help to explain the remaining socioeconomic gap in university attendance once attainment at age 16 has been accounted for. We find evidence that they do explain a small, but significant, part of the gap but that much more remains unaccounted for. This finding is also true for the inequality in attending highly competitive universities.

Our findings suggest that if young people from different socioeconomic backgrounds were studying a more similar curriculum between ages 14 and 16 it would be unlikely to make much of difference to the inequality in university entry highlighted by previous studies. This does not mean that ensuring pupils have the same opportunities to choose their curriculum post-14 regardless of their background is not important. We may regard this as important in itself for reducing socioeconomic differences in earlier educational trajectories, and also having the potential to make a difference to inequality in university going at the margin. However, we certainly should not regard reforms in this space as any kind of ‘silver bullet’.

References

Anders, J. (2012a). The link between household income, university applications and university attendance. Fiscal Studies, 33(2):185–210. doi:10.1111/j.1475-5890.2012.00158.x.

Anders, J. (2012b). Using the Longitudinal Study of Young People in England (LSYPE)/"Next Steps" for research into Higher Education access. DoQSS Working Paper 12-13, Institute of Education, University of London.

Anders, J., Henderson, M., Moulton, V., and Sullivan, A. (2016a). Incentivising specific combinations of subjects: does it make any difference to university access? Forthcoming, UCL Institute of Education.

Anders, J., Henderson, M., Moulton, V., and Sullivan, A. (2016b). The role of schools in explaining individuals' subject choices at age 14. Forthcoming, UCL Institute of Education.

Bell, J. F. (2001). Patterns of Subject Uptake and Examination Entry 1984-1997. Educational Studies, 27(2):201–219. doi:10.1080/03055690120050428.

Boliver, V. (2013). How fair is access to more prestigious uk universities? British Journal of Sociology, 64(2):344–364. doi:10.1111/1468-4446.12021.

Borghans, L., Golsteyn, B. H. H., and Stenberg, A. (2013). Does expert advice improve educational choice? IZA Discussion Paper IZA DO No. 7649, Institute for the Study of Labor.

Breen, R. and Yaish, M. (2006). Testing the Breen-Goldthorpe Model of Educational Decision-Making. In Morgan, S. L., Grusky, D. B., and Fields, G. S., editors, Mobility and Inequality: Frontiers of Research from Sociology and Economics, pages 232–258. Stanford University Press.

Chevalier, A. (2004). Parental education and childs education: a natural experiment. CEE Discussion Paper CEE DP 40, Centre for the Economics of Education, London School of Economics and Political Science.

Chmielewski, A. K. (2014). An international comparison of achievement inequality in within and between-school tracking systems. American Journal of Education, 120(3):293–324. doi:10.1086/675529.

Chowdry, H., Crawford, C., Dearden, L., Goodman, A., and Vignoles, A. (2013). Widening participation in higher education: analysis using linked administrative data. Journal of the Royal Statistical Society: Series A, 176(2):431–457. doi:10.1111/j.1467-985X.2012.01043.x.

Davies, P., Telhaj, S., Hutton, D., Adnett, N., and Coe, R. (2008). Socioeconomic background, gender and subject choice in secondary schooling. Educational Research, 50(3):235–248. doi:10.1080/00131880802309358.

Duquet, N., Glorieux, I., Laurijssen, I., and Van Dorsselaer, Y. (2010). An unfinished job? the effect of subject choice and family formation processes on labour market

outcomes of young men and women. Journal of Education and Work, 23(4):319–338. doi:10.1080/13639080.2010.484800.

Ermisch, J. and Pronzato, C. (2010). Causal effects of parents' education on children's education. ISER Working Paper 2010-16, Institute of Social and Economic Research, University of Essex.

Francis, B. (2000). The Gendered Subject: Students' subject preferences and discussions of gender and subject ability. Oxford Review of Education, 26(1):35–48. doi:10.1080/030549800103845.

Gibb, N. (2011). Speech by Nick Gibb to the Specialist Schools and Academies Trust.

Goldthorpe, J. H. and McKnight, A. (2004). The Economic Basis of Social Class. CASEpaper 80, Centre for Analysis of Social Exclusion, London School of Economics.

Groneau, R. (1998). A useful interpretation of r2 in binary choice models (or, have we dismissed the good old r2 prematurely). Working paper, Industrial Relations Section, Princeton University.

Hauser, R. M. (1994). Measuring socioeconomic status in studies of child development. Child Development, 65(6):1541–1545. doi:10.2307/1131279.

Havari, E. and Savegnago, M. (2014). The causal effect of parents' schooling on children's schooling in europe. a new iv approach. CEIS Tor Vergata Research Paper Vol. 12, Issue 5, No. 315, Cenre for Economic and International Studies Tor Vergata.

Henderson, M., Sullivan, A., and Anders, J. (2016). Social class, gender and ethnic differences in subjects taken at age 14. CLS Working Paper, Centre for Longitudinal Studies, UCL Institute of Education.

Hoxby, C. and Turner, S. (2013). Expanding college opportunities for high-achieving, low income students. SIEPR Discussion Paper 12-014, Stanford Institute for Economic Policy Research, Stanford University.

Iannelli, C. (2013). The role of the school curriculum in social mobility. British Journal of Sociology of Education, 34(5-6):907–928. doi:10.1080/01425692.2013.816031.

Jenkins, S. P. and Schluter, C. (2002). The effect of family income during childhood on later-life attainment: evidence from Germany. IZA Discussion Paper 604, Institute for the Study of Labor.

Jin, W., Muriel, A., and Sibieta, L. (2011). Subject and course choices at ages 14 and 16 amongst young people in England: insights from behavioural economics. DfE Research Report DFERR160, Department for Education.

Kolenikov, S. and Angeles, G. (2009). Socioeconomic status measurement with discrete proxy variables: Is principal component analysis a reliable answer? Review of Income and Wealth, 55(1):128–165. doi:10.1111/j.1475-4991.2008.00309.x.

Mood, C. (2010). Logistic regression: Why we cannot do what we think we can do, and what we can do about it. European Sociological Review, 26(1):67–82. doi:10.1093/esr/jcp006.

Noden, P., Shiner, M., and Modood, T. (2014). University offer rates for candidates from different ethnic categories. Oxford Review of Education, 40(3):349–369. doi:10.1080/03054985.2014.911724.

Olsson, U. (1979). Maximum likelihood estimation of the polychoric correlation coefficient. Psychometrika, 44(4):443–460. doi:10.1007/BF02296207.

Rose, D. and Pevalin, D. J. (2001). The National Statistics Socio-economic Classification: Unifying Official and Sociological Approaches to the Conceptualisation and Measurement of Social Class. ISER Working Paper 2001-4, Institute for Social and Economic Research, University of Essex.

Sullivan, A., Zimdars, A., and Heath, A. (2010). The social structure of the 14–16 curriculum in England. International Studies in Sociology of Education, 20(1):5–21. doi:10.1080/09620211003655572.

Walker, I. and Zhu, Y. (2011). Differences by degree: Evidence of the net financial rates of return to undergraduate study for england and wales. Economics of Education Review, 30(6):1177–1186. doi:10.1016/j.econedurev.2011.01.002.