Expectations and Aspirations in Higher Education

Dan Anderberg, Arnaud Chevalier, Melanie Lührmann, Ronni Pavan

Royal Holloway University of London

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Contents

Summary

Context and Focus: While a large body of research has mapped out how participation in higher education varies across demographic groups, the decision to make such an investments reflects aspirations and expectations, the patterns of which have been much less studied. The over-arching focus of the project has hence been on higher education aspirations and expectations. The project had three strands, each focusing on a sub-question and each drawing on a different type of data source.

1. Aspirations about future study among children aged 10-15 and, in particular, the effect of changes in higher education tuition fees.

2. Expectations about post-graduation earnings among students embarking on higher education.

3. The role of international diversity for choices and performance in higher education.

This report brings together these findings.

Aspirations and the Effect of Tuition Fees: Our key research question in this part of the project was how aspirations towards higher education vary among students still in compulsory education and to what extent aspirations might be affected by to the cost of attending university.

Methodology: We used data from a youth questionnaire in Understanding Society, studying self-stated aspirations and preferences of children aged 10 to 15.[1] The main research focus was on the impact of the raising of the university tuition fees that was announced in December of 2010. To this end, we used that the higher fees applied particularly to students from England. In contrast students from Scotland, Wales and Northern Ireland could benefit from lower fees by opting to study in their home countries. This asymmetry created a "natural experiment" with English students being the "treated group" and students from the remaining countries as "control groups". Our work complements recent research on the effect of the tuition fee reform on actual university enrollment. The effects that the reform had on enrollment would be mixture of student ("demand side") and university ("supply side") responses. In contrast, by focusing directly on measured aspiration, our work focuses on the immediate impact of the reform on demand intentions.

Findings: We showed that there is a substantial variation in aspirations by gender and socioeconomic background. Turning to the question of the impact of university tuition fees, the natural experiment generated by the 2010 tuition fee increase allowed us to test for whether the fee reform particularly affected the aspirations of the affected English students. As the students that we studied were still in the compulsory stages of their education, we explored their aspirations not only directly towards higher education but

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[1] Understanding Society is a study that captures important information every year about the social and economic circumstances and attitudes of people living in the UK. Building on the successful British Household Panel Survey, Understanding Society follows whole households and covers all ages allowing researchers to understand the life courses of the whole population over time; 40,000 UK households have contributed to the study from all areas of the UK. Understanding Society also collects additional health information from around 20,000 of the people who take part.

also towards the post-compulsory education path leading towards university studies and their aspirations towards getting a graduate job.

Our core findings can be summarized as follows:

- We provide descriptive statistics that teenage girls have higher aspirations than boys towards GCSEs, A-levels, and University but not towards graduate jobs. We also document that there are large differences in aspirations towards education by parental socio-economic status.
- Our results indicate that, on average and controlling for background factors, the tuition reform decreased A-levels and University aspirations of teenagers residing in England by 4.5 and 1.9 percentage points compared to those residing in the control groups (Scotland, Wales, and Northern Ireland). Considering that mean aspirations towards A-levels and University are 81% and 84%, the impact of the reform translates to a reduction of 5% and 2%, respectively. We do not find a statistical significant impact on Graduate Jobs Aspirations.

We perform these analyses by gender and socioeconomic background. We find that the reform had a larger negative impact on aspirations of teenage boys compared to teenage girls, substantially increasing the gender gap. Similarly, we find that the reform increased the A-level aspiration gap between children from high- and low socio-economic background (while no statistically significant differences by socio-economic background of the impact of the reform on GCSE and university aspirations were found).

Expectations at the Start of University Studies. Our main research question in this part of the project was to explore the variation in the future earnings expectations of

students commencing their university studies. In particular we wanted to explore whether there were any clear biases in expectations, and if so for whom and in what dimension and direction.

Methodology: In order to study the expectations of young people entering higher education, we created a survey targeted at first year undergraduate students at Royal Holloway University of London in the 2015 and 2016 academic cohorts. To implement the survey we developed a smartphone application and an accompanying online platform. The survey, which was completed by little over 600 students (a response rate of about 10%) elicited expectations about study outcomes and earnings at around age 30. The survey was linked to administrative data providing further individual information. Measured earnings expectations were compared to observed earnings of current individuals aged around 30 in the LEO data (Longitudinal Education Outcomes, Department for Education) as reported by (DfE, 2018).

Findings: Our key findings were

- Most students' have realistic expectations about the average earnings of graduates. Moreover, variation in expectations across subjects are well in line with empirical earnings data. Female students have lower expected graduate earnings than male students.
- Overall students were also found to have an accurate expectation of the average earning of a non-graduate. About 3/4 of students -- both male and female -- expected a positive graduate premium, that is a higher average level of graduate earnings than non-graduate earnings.

- Male students were found to systematically expect their individual graduate earnings to be higher than the average among other males with the same degree subject. Female students more frequently expected their individual graduate earnings to be similar to the average among other females with the same degree subject.

There was no strong gradient in expected graduate earnings by socio-economic background conditional on degree subject, either when measured by the HE participation rate in the local area or by parental background.

Diversity in the Classroom: In this part of the project we move towards exploring how the environment encountered whilst at higher education itself affect subsequent choices and outcomes. In this project we selected one particular aspects of the university learning environment: the international diversity of student peers in the classroom. Given the UK's leading position as host country for international students, how the presence and concentration of international students affects the learning experience of both natives and the non-natives themselves is an important question. One key channel for such an effect is through direct social interaction. To capture this particular channel, use direct information on each student's native language as this allows us to measure not only the share of non-native speakers in a particular seminar group, but also the level of language diversity.

Methodology: Credible research designs need to tackle the perennial problem of students' self-selection into programmes and courses. To overcome this issue we use data on over 2,000 economics undergraduate students – about half of whom were not native English

speakers – at Royal Holloway University of London who were randomly allocated to seminar groups in first and second year compulsory courses. Classifying students as native and non-native (English speakers) by their country of birth, we study how the native v. non-native mix and the linguistic diversity in the class room affects outcomes and choices of both natives and non-natives.

Findings: We relate the share of non-natives and classroom diversity in the first instance to course outcome, but also to subsequent course choices, graduation outcomes, and post-graduation outcomes. In terms of course outcome (course grade and pass/fail) we find that the share of non-native speakers affects neither natives nor non-natives. Diversity however improves the course outcomes of non-natives. Similarly, there is no effect of non-native share and diversity on the subsequent study choices and outcomes of natives, but some evidence of an improvement for non-natives. Looking beyond graduation, a higher non-native share and greater diversity appears to encourage natives to undertake post-graduate studies.

An obvious caveat to the findings is of course that the sample is particular – from one subject at one higher education institution – which of course raises the question of the how generalizable results are. Nevertheless, overall the findings suggest that at the current level of internationalisation, there is no evidence of any negative effects of non-English speakers on the learning of native students, and that diversity improves the learning and integration on non-English students.

Conclusion: The findings from the project lend support to the view that young people are fairly well informed when it comes to their individual costs and benefits of investing in

higher education. Even the study aspirations of children as young at 10-15 seem to be responsive to changes in the cost of attending higher education, while students just entering higher education appear to have largely realistic expectations about their likelihood of successfully completing their studies and their likely future earnings. In addition, in relation to the internationalisation of the UK higher education sector our findings do not suggest any negative effect of non-English speakers on the learning of native English-speaking students.

Introduction

A substantial amount of empirical work has been devoted to studying patterns of participation in post-compulsory education in general and higher education in particular. Recent work has documented important variation in participation by gender, socioeconomic background and ethnicity (Crawford and Greaves, 2015). Less effort has been devoted to understanding *how young people take decisions* about whether to engage in post-compulsory education, what information they base their decisions on, and *how educational aspirations react to changes in the economic environment*. Yet educational and occupational aspirations in particular have become a key focus in the policy debate about educational inequality.

The most basic economic model of investments in education assumes that individuals take decisions to maximize their net discounted lifetime income. This implicitly assumes that young individuals form expectations about the returns to education as it applies to them personally, given their individual academic ability and demographic characteristics. While there is an extensive and convincing literature that suggests that the effects of various post-compulsory education choices on wages are large, the same literature also suggests that the wage-returns may be highly heterogenous across individuals and available options (Belfield et al., 2018). Hence young people making choices would need a very detailed level of information, enabling them to predict what earnings an individual with their particular characteristics can expect from each relevant available option. *Relatively little is known about the expectations about the returns to education held by young individuals*. Do they, on average, have realistic expectations about wage returns? How do expectations compare to the best available data? Are there demographic

subgroups who systematically under- or over-predict the returns the wage returns pursuing higher education.

Recent years have seen a sharp improvement in data availability for studying how early-career earnings vary at a very fine level of detail. This data improvement has been particular stark for university graduates. Building on a longer-running US literature measuring how graduate earnings vary with degree subject (see Altonji et al., 2012), a recent set of contributions from the UK has been documenting that the returns to a degree vary substantially by subject (Walker and Zhu, 2013, 2018; Britton et al., 2016; Belfield et al., 2018) and by institution attended (Chevalier and Conlon, 2003; Britton et al., 2016). This research has received a significant boost most recently by the creation of the Longitudinal Educational Outcomes (LEO) database, created by the Department for Education. Researchers in the field now have access to an unprecedented amount of data linking individuals' educational attainment at primary and secondary school level to details of their university studies, and further on to their early labour market outcomes. Nevertheless, one of the key stumbling blocks for this literature is accounting for how individuals self-select into subjects and institutions, thereby limiting the interpretation of findings in terms of causal effects.

The empirical literature in economics has naturally also sought to establish the root causes of the relationship between social background and enrollment in higher education in particular and post-compulsory education more generally. While focus has increasingly turned to differences in prior attainment and hence to investments made throughout childhood, it is also clear that there are significant gaps in participation remaining even after conditioning on academic ability (Crawford and Greaves, 2015). Discouragingly, using

data from two well-known cohort studies – the National Child Development Study (NCDS) of children born in 1958 and the British Cohort Study (BCS) of children born in 1970 – Galindo-Rueda and Vignoles (2005) found a decline in the importance of ability in explaining educational performance, in part driven by low ability children from high socioeconomic status families experiencing the largest increases in educational participation and attainment.

This literature has also explored the potential role of financial constraints. However, as relatively little evidence has been found of any substantial constraints preventing young individuals with high academic ability from poorer households investing in post-compulsory education, focus has increasingly turned to aspirations and information. In this context, a number of recent contributions have highlighted how aspirations and attitudes to education vary across socioeconomic groups (Chowdry et al., 2011; Gregg and Washbrook, 2011; Archer et al., 2014; Baker et al. 2014). However, *less is known about whether and how aspirations respond to changes in the economic environment*. This is of central importance: for policy to be successful in tackling inequalities in educational participation and investments, it has to first affect aspirations and hence intentions and willingness to participate.

Human capital theory suggests that students who invest in education gain skills that make them more productive in the labour market and have help them gain higher wages (Becker, 1964). However, in the vast majority of studies that invoke the human capital framework, *the actual technology for how skills are formed is treated as a "black box"*. Indeed, not even comprehensive data resources such as LEO provide any particular insights what are the elements and components of a particular degree that generate faster

or slower acquisition of valuable skills. In order to better understand what elements and features of a particular degree programme foster skills we need data of a different nature, data that quantifies the inputs, for instance teachers' skill, teaching and assessment structure, and peer composition. However, even with such detailed data on the inputs into the human capital investment technology, the challenge remains that students are typically self-selecting into programmes and options making it difficult to rule out confounding effects of unobservable individual characteristics.

Effect of University Tuition Fees on Children's Educational Aspirations

The "widening participation" agenda has sought to increase higher education participation of the pupils from lower socio-economic backgrounds (Wiseman et al. 2017). Set against this backdrop the increase the tuition fee cap, from £3,465 to £9,000 per year in the 2012-2013 academic year was potentially a policy change operating in the exact opposite direction.

The purpose of this paper is to study whether the increase in university tuition fees affected education aspirations of children still in compulsory secondary education. The increase in university tuition fees changed the costs of acquiring a degree while keeping the gross returns constant. The increase in tuition fees could thus be expected to decrease the demand for higher education by decreasing the net returns. Our first hypothesis is hence that the tuition fee reform reduced aspirations towards higher education. However, the change in tuition might not affect all children in the same way. Families from lower socio-economic backgrounds are more likely to be financially constrained and hence more sensitive to cost-considerations. Hence our second hypothesis is that the reform had a more negative effect on the aspirations of children from lower a socio-economic background, thus increasing the socio-economic gap.

Our identification strategy comes from the fact that students residing in Northern Ireland, Scotland, and Wales would have the option of staying in their home country and pay lower tuition fees. In contrast English students would have to pay the maximum tuition fees irrespective of the country of study. Therefore, we define England as the treated country, and Northern Ireland, Scotland, and Wales as control countries. We define the

treatment period when the reform was first announced (December 2010) rather than the day when the reform was implemented. We use data from six waves of Understanding Society, the UK Household Longitudinal Study, in which household members 10-15 years old are asked to complete a self-completion youth questionnaire. We construct three variables which quantify educational aspirations. Naturally we measure aspirations to attend university. But we further measure aspirations toward post-compulsory education choices that represent paths towards university studies (GCSEs and A-levels in England, Wales and Northern Ireland; equivalent qualifications in Scotland). Furthermore, we study aspirations towards getting a graduate-level job.

Our analysis of the impact of the tuition fee reform on aspirations is strongly complementary to existing analyses of the impact to the reform on enrollment and applications. Recent research has found that the tuition reform did not have any clear negative impact on enrollment (Azmat and Simion, 2019; Sa, 2014; Murphy et al., 2018). However, the estimated effects of the reform on enrollment capture the combined effects of a set of responses both by prospective students (the "demand side") and by universities (the "supply side") for instance in relation to admissions and the quality of provision. The combined equilibrium response is important for understanding the overall effect of the reform, but does not generally disentangle response components. As a result, such studies may not be a useful guide to any potential further reform. In this respect, a study of aspirations and intentions provides a more direct approach to isolate the impact of increased tuition fees on demand. Consequently, it follows that the impact on aspirations may be different from the impact on eventual enrollment for several reasons: (i) "Aspirations" capture intentions to respond on several possible dimensions, including

degree subject choice, timing of undertaking of university studies, distance from home etc. and so may respond more strongly than any single dimension, (ii) aspiration responses are measured at the time of the announcement of the increase in tuition fees, whereas prospective students would have gather full information about available income-contingent loans put in place as compensating policy-feature prior to applying and enrolling, and (iii) the shift in the tuition fee policy allowed universities to improve the quality of university degrees in the years following the policy change and also to recalibrate their admissions policies, which would not be reflected in the measured immediate impact on aspirations.

THE TUITION STRUCTURE AND REFORM

The 2012-13 tuition reform was first announced on Tuesday 14th of December 2010. The reform raised the tuition fee cap universities across the UK could charge, from £3,465 to £9,000 per year. However, students from Scotland, Northern Ireland and Wales could avoid the higher fees by opting to study in their home country. The exception was thus students from England who would be facing the maximum fee irrespective of where they would choose to study. Table 1 provides a schematic overview of what fees a student could be expected to face depending on home country and study country.

Our identification strategy thus relies on the fact that students born in Northern Ireland, Scotland, and Wales have the option of staying in their home country and pay lower tuition fees while English students have to pay the maximum tuition fees irrespective of where they study.

Table 1: Schematic overview of university tuition fees by country

| | Before | | After | | | |
| | | | Study in Home Country | | Study Abroad | |
Country	Tuition Fee Cap per annum	Student Finance	Tuition Fee Cap per annum	Student Finance	Tuition Fee Cap per annum	Student Finance
England	£3,000	Means tested £3,000 loan	£9,000	Up to £9,000 loan	£9,000	Up to £9,000 loan
Scotland	£3,000	Tuition covered by SAAS	No Tuition Fees	Tuition covered by SAAS	£9,000	Up to £9,000 loan
Wales	£3,000	Means Tested £3,000 loan	£9,000	£5,535 grant £3,465 loan	£9,000	£5,535 grant £3,465 loan
Northern Ireland	£3,000	Means Tested £3,000 loan	£4,000	Up to 4,000 loan	£9,000	Up to £9,000 loan

The policy change received significant media attention and was well-known from the
moment it was announced. To highlight this, Figure 1 shows that the announcement dates
coincides with the peak general interest in tuition fees, as evidenced by Google data.
Motivated by this figure, we define the treatment period from 14 December 2010 onwards
and take this figure as an indicator that individuals in the UK as well as young people aged
10 and older became aware of the increase in university tuition fees upon the reform
announcement.

Figure 1: Interest in tuition fees in the UK over time
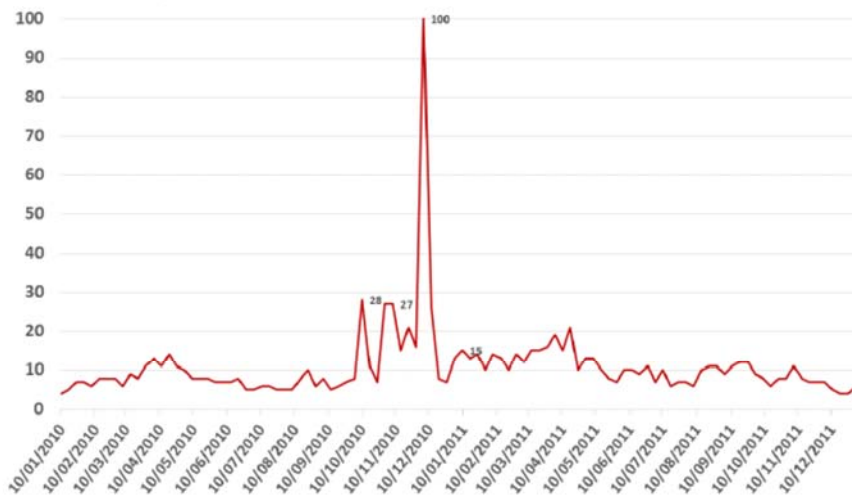
Data source: Google Trends (www.google.com/trends). The figure shows the search for term "Tuition Fees" in the UK. Numbers represent search interest relative to the highest point on the chart for the given region and time. A value of 100 is the peak popularity for the term. A value of 50 means that the term is half as popular. Likewise a score of 0 means the term was less than 1% as popular as the peak.

DATA

We use seven waves of Understanding Society, the UK Household Longitudinal Study, covering the period between 2009 and 2016. Understanding Society is a representative sample of over 40,000 UK households, which are followed over time. Main data is collected each year from all adult household members (age 16 or older). We focus on children aged 10 to 15 in participating households, who are asked to fill in a self-completion youth questionnaire. The sample consists of 10,704 children.

Our main variables of interest are aspirations towards education and future occupational choices. We distinguish four dimensions: we capture aspirations towards i) achieving general qualifications (GCSEs), ii) obtaining qualifications that allow for the pursuit of

Higher Education (i.e. A-levels), iii) intentions to go to university, and iv) job aspirations towards a graduate job, i.e. a job that requires a Higher Education degree. We construct binary indicators of high and low aspirations for each dimension as outlined in Table 2.

Table 2: Definitions of educational aspirations

Aspiration	Survey instrument	Definition of high aspirations
General qualifications (GCSEs)	"How important is it for you to do well in GCSEs exams or Standard Grades (in Scotland)?" - very important - important - not very important - not at all important	high: "very important"
Advanced qualifications (A-levels)	"What would you like to do at age 16?" get a full-time job stay at school or college to do A levels/Highers - get an apprenticeship - do some other form of training - do something else - don't know	high: "stay at school or college to do A levels/Highers"
Study at university	"Would you like to go to University?" - yes - no - don't know	high: "yes"
Job aspirations (graduate job)	"What job would you like to do once you leave school or finish your full-time education?" open answer	high: job that requires HE degree

We match the aspirations data from the youth surveys with demographic family information, including mother's and father's education (A-level or higher). Aspirations were generally found to be high across all four dimension. For all three education dimensions, girls were found to have higher aspirations than boys (see Table 3).

Table 3: Aspirations by gender

Aspiration	type	Male	Female	p-value(Mean-Dif)
GCSEs	Mean	0.738	0.786	0.010
	Std Dev	(0.440)	(0.410)	
	No.	3,652	3,599	
Alevels	Mean	0.759	0.872	0.000
	Std Dev	(0.427)	(0.334)	
	No.	3,311	3,254	
University	Mean	0.790	0.897	0.000
	Std Dev	(0.407)	(0.304)	
	No.	3,000	3,082	
Graduate Job	Mean	0.761	0.753	0.551
	Std Dev	(0.427)	(0.432)	
	No.	1,958	2,015	

All the aspiration variables are defined in binary term where high aspirations are reported as 1 and low aspirations are reported as 0. Data Source: Understanding Society (waves 1-3, 2009-2010).

Aspirations were also found to differ by socio-economic background. Table 4 highlights how aspirations varied by mother's education.

Table 4: Aspirations by mother's education

Aspiration	type	A-level and Above	Below A-level	p-value(Mean-Dif)
GCSEs	Mean	0.778	0.750	0.007
	Std Dev	(0.416)	(0.433)	
	No.	3,524	3,226	
Alevels	Mean	0.868	0.762	0.000
	Std Dev	(0.337)	(0.426)	
	No.	3,219	2,904	
University	Mean	0.893	0.797	0.000
	Std Dev	(0.310)	(0.402)	
	No.	3,032	2,633	
Graduate Job	Mean	0.816	0.713	0.000
	Std Dev	(0.387)	(0.452)	
	No.	1,933	1,737	

All the aspiration variables are defined in binary term where high aspirations are reported as 1 and low aspirations are reported as 0. Data Source: Understanding Society (waves 1-6, 2009-2010).

EFFECT OF THE TUITION FEE REFORM

Here we will summarize the core findings with respect to the effect of the tuition reform

on the aspirations of children aged 10-15. Here we also focus mainly on aspirations towards

A-levels and university studies. Details of all results can be found in the associated research paper.

Overall Impact

Our results indicate that the reform decreased A-levels and University aspirations of children aged 10-15 residing in England by 4.5 and 1.9 percentage points. Considering that mean aspirations towards A-levels and University are 81% and 84%, the impact of the reform translates to a reduction of 5% and 2%, respectively. In contrast, we found no impact aspirations towards graduate jobs and positive impact on GCSE aspirations. A possible explanation for the latter result is that pupils may consider GCSEs as important to get other qualifications beyond acting as a route to university studies.

Impact by Gender

The reform decreased aspirations of both teenage girls and boys towards A-levels, however its negative effect was larger for boys (6.7 percentage points) than for girls (2.8 percentage points). As girls already had higher aspirations before the reform, the results indicate that the reform contributed to increasing the aspiration gender gap by 50 percent.

A similar result was found for university aspiration: Boys' aspirations decreased by 4.4 percentage points and we find no significant impact on girls' university aspirations. Hence the results suggest that the reform also increased the university aspiration gender gap. No strong results were found for aspirations for GCSEs and graduate jobs.

Impact by Mother's Education

The strongest results were again found for aspirations towards A-levels. Here we found that the reform reduced the aspirations of children with highly educated mother by 3.4 percentage point and reduced the aspirations of children with low educated mothers by 6.4 percentage points. Hence the results suggest that the reform increased also the socio-economic gap in A-level aspiration. In contrast, for university aspirations, we found no evidence that the negative effect was stronger for children with low educated mothers. These results were generally found to hold for both genders.

Expectations of Students Commencing University Studies

Over the past few decades, economists engaged in survey research have increasingly started to ask respondents about their expectations about significant personal events. Yet, only a small set of studies to date have elicited expectations about an individual decision with far-reaching consequences for lifetime earnings and wealth, health and other life circumstances – the choice whether to pursue a university degree. Instead, models of education choices often rely on the (strong) assumption that prospective students are informed about the market returns to these choices.

A few recent examples have started providing insights. Arcidiacono, Hotz and Kang (2012) elicited earnings expectations among students at Duke University for their own chosen major and for counterfactual majors. They show that earnings expectations are key drivers of college major choice. Hastings, Neilson, Ramirez and Zimmerman (2016) jointly investigate expected returns and costs of Higher Education in Chile. They confirm that on average, students expectations are relatively accurate but emphasize their large variance. Cost and return expectations are "correctly centered but noisy".

The preliminary insights thus suggest that young people's earnings expectations and their expectations of the return to Higher Education are on average quite accurate but display large heterogeneity around the mean. Since these expectations have been shown to be important drivers of education choices, a better understanding of this heterogeneity is important to identify those who may significantly under- or over-estimate the returns to education. One particular dimension that may be related to expectations is socio-economic background. Delavande and Zafar (2013) report briefly on the outcomes of the

first elicitation of earnings expectations and education choices in the UK, based on a specific module in the 5th Innovation panel of Understanding Society. They focus on parental expectations and find marked differences by socio-economic status: 78 percent of parents belonging to high-income households believe their child would gain the required qualifications for University, but only 67 percent of lower-income households believe so.

For the current project we hence designed a survey to add to the currently scarce set of data resources on student expectations and to serve as a useful pilot study for future work on expectations in Higher Education. In this capacity the survey also served as a validation of the expectations module which has – with minor amendments – been implemented in the age 17 Millennium Cohort Study.

To enable students to take part easily and provide an efficient setting for data collection and processing, the research team developed a survey app – available both on the Android and Apple platform -- with the support of the Computer Science department. However, in spite of the use of new technology designed to reduce the survey burden through flexibility in when to answer questionnaires and the extensive advertising activities, response rates fell substantially below expected rates. We targeted first year students before and during their first weeks at university, i.e. before they could obtain further information on their subject through teaching activities. The main questionnaire consisted of a short module of questions on students' expectations with respect to study performance at university and future labour market outcomes. The survey information was subsequently linked to administrative university records containing socio-economic information for respondents.

THE SURVEY SAMPLE

The sample of participating students was fairly representative of the undergraduate student population at Royal Holloway in terms of gender and ethnicity. There was also a good spread across subjects which we group into five main undergraduate degree groups.

Table 5: Respondents' degree subjects

Category	Subjects	Frequency (Percent)
Arts & Humanities	English, Literature, Modern Languages, History, Classic Studies, Philosophy, Film Studies & Media, Drama, Music, Liberal Arts	163 (25.43)
Social Sciences	Psychology, Politics, Geography, International Relations, Criminology, European Studies	134 (20.90)
Management & Law	Management, Law	58 (9.05)
Economics	Economics	78 (12.17)
STEM	Mathematics, Molecular Biology, Biochemistry, Zoology, Computer Science, Biomedical Sciences, Physics	84 (13.10)
Postgraduate	Postgraduate Degrees	26 (4.06)
No Records	Unknown degree of respondent	98 (15.29)

EXPECTATIONS ABOUT STUDY PERFORMANCE

In the main survey module, we elicit the study expectations of entering study cohorts. More specifically, we ask how likely individuals think it is that they will not complete an undergraduate degree. The average expectation was found to be high: 90% of students expect the likelihood of not receiving any undergraduate degree as low. Hence, students do not generally seem worried about higher education being a risky choice.
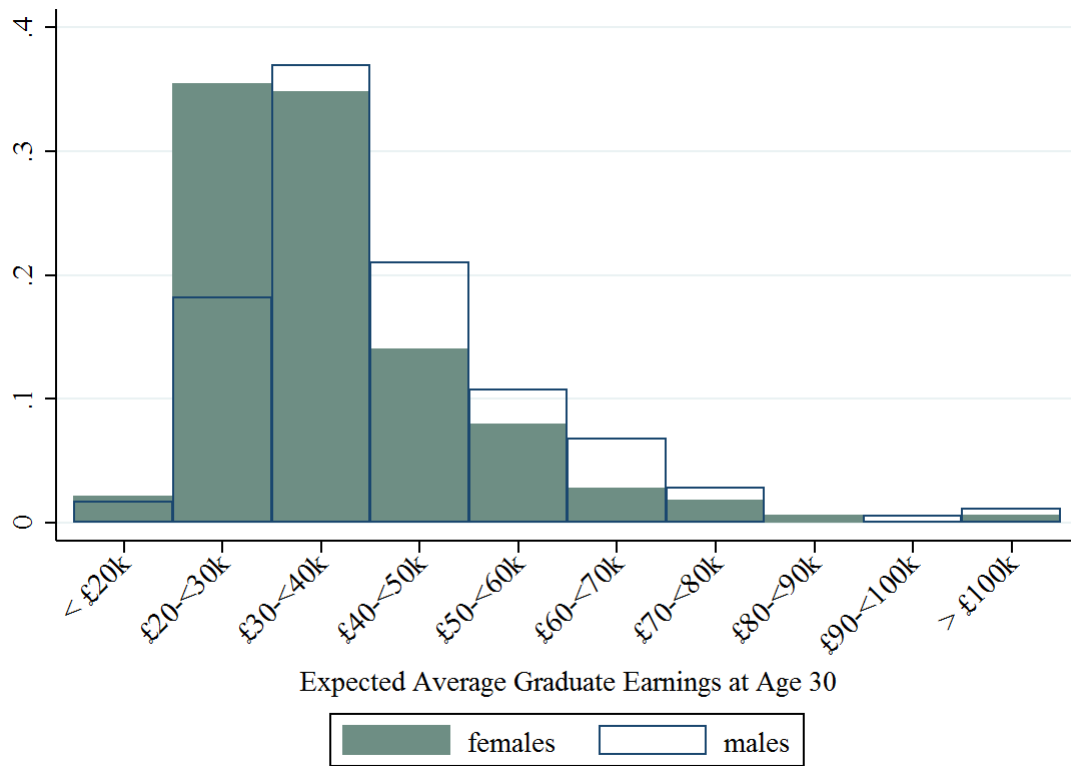
EARNINGS EXPECTATIONS

Our main object of interest however are students' expectations of future earnings and returns to Higher Education. In all questions, we focused on earnings at age 30 as a target age at which most students will have entered the labour market. Three separate lines of enquiry were developed.

- To gain information on the *expected* returns to education, we compare counterfactual earnings expectations with and without a completed undergraduate degree.

- We explore whether entering students have realistic expectations about *average* graduate earnings at age 30. To do so we compare students' expectations based only on degree and subject (not individual ability/productivity) to current median earnings of UK graduates 10 years after their graduation, around age 30.

- We determine to what extent earnings expectations are driven by *individual characteristics* including gender and socio-economic characteristics.

Expected Average Graduate Earnings

Figure 2 shows the distribution of earnings that students expect for an average graduate of own gender who works in the UK at age 30, by gender. Overall, about 34% of entering students expect earnings between £30,000 and 40,000, while another third of students expect an average graduate to earn less than £30,000, and only about 18% of students expect average graduate earnings to be above £50,000 at age 30.

Figure 2: Expected average graduate earnings at age 30 by gender

These results suggest most students' expectations are relatively accurate compared to current average earnings of UK graduates. According to the Graduate Outcomes report for 2015/2016, based on LEO data from the Department for Education (2018), male first-degree graduates from English Higher Education Institutions that graduated in 2004/05 had median earnings of £35.200, while their female counterparts has median earnings of £27,200.

Respondents were are asked to report their expectations for graduate earnings for an average person of their own gender and subject. We found that there were statistically significant differences across subject groups. The highest earnings expectations were found for Economics students and the lowest for students in Arts and Humanities. Again

it was generally found that average expectations across subjects had a high correlation with the subject-pattern observed in the LEO data.

Expected Average Non-Graduate Earnings

The survey participants were also asked about what they expect non-graduating students to earn. By doing so, we can infer expectations about the return to completing an undergraduate degree.

We find that entering students expect low earnings for an average person who drops out of their degree before completion. Almost 50 % expect non-graduates to earn less than £20k at age 30, and 85% expect annual earnings lower than 30,000, and female students expect non-graduate earnings to be lower than male students. According to Britton et al. (2016) the median annual earnings of non-graduates (earning a minimum of £8,000) at around age 30 was £22,000 for males and £18,000 for females in the tax year of 2011/12. The results of the survey again indicate that students had an accurate expectation of the average earning of a non-graduate in the UK.

Combining the information about expected earnings of graduate and non-graduate, we find that about 75% students expect that a degree has an earnings return in the sense that they expect average graduate earnings to be higher than average non-graduate earnings. Moreover, the proportion expected a return to a degree was found to be the lowest among students in Arts and Humanities and the highest in Economics. The average expected degree earnings premium was found to be over £18,000.

Expected Individual Earnings

The difference between expected *own* graduate earnings at age 30 and expected earnings of an *average person of the same gender and degree subject* gives us an indication of whether students think their career prospects are above average. This can be due to multiple factors like individual heterogeneity in ability, valuable work skills that are not captured in the degree certificate, or simply overconfidence.

Here we find striking gender differences. Among females, 32% expect to do better than average while more than 50% of female students expect to have the same earnings at age 30 as the average female graduate with the same degree subject. For men, the rank order is reversed: almost 50% expect to do higher than the average male graduate with the same degree subject, and about 40% of males expect to have the same earnings at age 30 as the average male graduate with the same degree subject.

However, the same pattern holds also for individual expectations about non-graduate earnings: among men over 40% of mean expect to earn more than the average non-graduate whereas only few females expect that they would deviate from average female non-graduate earnings if they themselves failed to graduate. As a result there is little gender-differences in terms of expected individual earnings premia from graduating.

Expected Average Earnings by Social Background

The linkage between the survey data and administrative student records allows us to make use of two indicators of socio-economic background: parents' education and an indicator of Higher Education participation in the students' location of residence (at the time of applying). Local areas were characterized in terms of the HE participation rate using

POLAR2.[5] POLAR2 is based on the HE participation rates of people who were aged 18 between 2000 and 2004 and entered a HE course in a UK higher education institution or further education college, aged 18 or 19, between academic years 2000-01 and 2005-06. As such it could capture area-level information and the availability of peers who may disseminate information about graduate earnings.

Relating students' expectation to POLAR2 quintile, we find no distinct gradient for students of any subject group (with the possible exception of Economics where a positive gradient was found). Here there is no indication that students from areas characterized by a lower HE participation rate have either systematically higher or lower graduate earnings expectations.

We further explored whether earnings expectations varied by ethnicity and parents' education. However, no strong results were found, suggesting little in way of systematic differences in earnings expectations by own demographic characteristics beyond gender.

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[5] The participation of local areas (POLAR) classification groups areas across the UK based on the proportion of the young population that participates in higher education (www.officeforstudents.org.uk).

Diversity in the Classroom

International migration and issues surrounding the integration of international migrants have been recently at the forefront of the political debate, no more so than in the UK where migration issues and policies dominated the "Brexit" discussions. Concomitantly, international student migration has more than doubled since 2000, reaching, in 2014, 4.3 million pupils worldwide in higher education in a country in which they are not a national (UNESCO, 2018). The UK is one of the main host countries of international students who represent 20% of all higher education students.

How to provide teaching to student groups that contain both home and international is a major challenge for education providers. International students, due to their lower familiarity with the native language might reduce the amount of effective teaching taking place in the classroom for all pupils, in a way similar to the model of disruption of the education production presented in Lazear (2001). However, international students might also be more motivated (Bütikofer and Peri, 2017) leading to positive peer effects, and by altering the skill distributions increase the returns to education.

This part of the project focuses on the how the mix of students in the HE setting matters for choices and outcomes. The study distinguishes students by their country of birth and in particular whether they are native English speakers (henceforth referred to a "natives" for simplicity). As such his part of the project makes two contributions relative to the existing literature. First, we assess the impact of non-native students in a higher education set-up rather than in schools which has otherwise been the main research focus to date (Ballatore et al., 2018; Brunello and Rocco, 2012; Jensen and Rasmussen, 2011; Gould et al.,

2009; Geay et al., 2013; Ohinata and van Ours, 2013). There are good reasons to believe that the effects of class-room diversity might be different at HE level than at school level as non-native HE students are more likely to have made their migration decision based on education. Second, we do not treat non-natives as a homogenous group, but instead explicitly consider the diversity of the group of non-natives. Diversity affects the costs and returns to integration, in particular in term of learning English; i.e. the larger the group of students speaking the same foreign language the lower their incentives to learn English.

The analysis is conducted using proprietary administrative data from the Economic department at Royal Holloway, University of London for the years 2006 to 2014 and contains the records of over 2,120 students. The institution is characterised by a large fraction of non-natives (above 50%), and a large variation in their origin. If students choose which classes to join it would be difficult to identify peer composition effects as these would be confounded by self-selection effects. In order to tackle this problem we focus on a particular setting where students were quasi-randomly allocated into seminar groups on large compulsory modules in first and second year. While students attend lessons, most student interactions take place in the associated seminars. Each compulsory module would have multiple seminar groups into which the students were randomly allocated (and opportunities for switching were severely limited). Importantly the allocation process made no attempt to "balance" groups and made no provision for friends to join the same group. We then relate the variation in the composition of a student's seminar group to their subsequent module grade in the first instance and to a set of further longer-term outcomes, including what options they choose later on in their degree, whether they go on to study at the post-graduate level, and their short-term post-

graduation employment outcomes (using matched information from the Destination of Leavers from Higher Education).

The full sample used for the analysis consist of 2,120 students assigned to total of 332 seminar groups during the period between 2006 and 2016. Background information on each student includes age, gender and nationality. A student's native language is not directly observed, and is hence imputed using the predominant language in the country of origin. For each seminar group in the sample, we compute the share of non-native English speaking students. We measure diversity using a Blau index, $D = 1 - \sum_k p_k^2$ where p_k is the fraction of language group k speakers among the non-native speakers. The index intuitively measures the probability that two non-native speaking students have the same language background.

The random assignment of students to the seminar groups is central to the research design. The seminar assignment of students was done on purely unsystematic basis by course administrators. In order to verify the allocation indeed was (and remained) random we used the original pool of students and created a simulated random allocation. If the actual allocation was indeed random the actual and the simulated allocations should have the same distribution of the share and diversity measures. Figure 3 shows the actual and simulated shares and diversity measures.

Figure 3: Simulated versus actual seminar composition
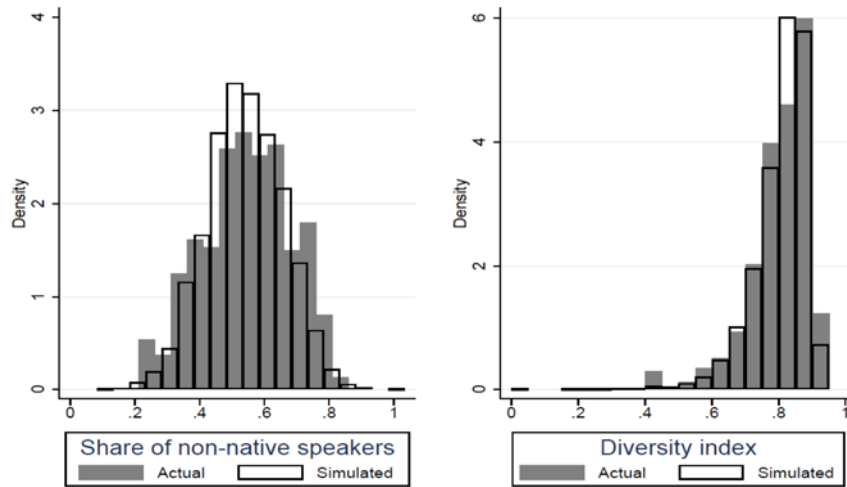
The figure confirms a large empirical variation in both measures.

We describe three sets of results. First, the contemporaneous test performance of both native-speaking English students and non-English students is largely unaffected by the share of non-English students. For students from a non-English background, being exposed to higher diversity improves their performance, especially at low level of performance, reducing the probability of non-English students failing the test. We do not observe a similar effect of diversity for native English-speaking students.

Table 6: Diversity and educational performance

Sample	Grade	Fail	Honour	Grade	Fail	Honour
Total						
Share of non-natives	-0.030	0.068*	0.016	-0.042	0.075*	0.018
	(0.122)	(0.039)	(0.055)	(0.122)	(0.039)	(0.055)
Blau Index	–	–	–	0.210*	-0.113***	-0.036
	–	–	–	(0.128)	(0.042)	(0.058)
Mean of dep. var.	0.000	0.167	0.402	0.000	0.167	0.402
R^2	0.05	0.08	0.13	0.05	0.08	0.13
No. of observations	8505	8505	8505	8505	8505	8505
English						
Share of non-natives	0.005	0.058	-0.016	0.010	0.061	-0.014
	(0.177)	(0.060)	(0.075)	(0.177)	(0.059)	(0.075)
Blau Index	–	–	–	-0.102	-0.052	-0.029
	–	–	–	(0.157)	(0.063)	(0.076)
Mean of dep. var.	0.082	0.146	0.428	0.082	0.146	0.428
R^2	0.08	0.10	0.15	0.08	0.10	0.15
No. of observations	3909	3909	3909	3909	3909	3909
Non-English						
Share of non-natives	-0.006	0.077	0.050	-0.036	0.088	0.053
	(0.171)	(0.059)	(0.074)	(0.170)	(0.059)	(0.073)
Blau Index	–	–	–	0.446**	-0.159**	-0.044
	–	–	–	(0.189)	(0.062)	(0.077)
Mean of dep. var.	-0.069	0.186	0.380	-0.069	0.186	0.380
R^2	0.08	0.10	0.16	0.08	0.10	0.16
No. of observations	4596	4596	4596	4596	4596	4596
Course × term FE	yes	yes	yes	yes	yes	yes
Study program FE	yes	yes	yes	yes	yes	yes
Day/Time FE	yes	yes	yes	yes	yes	yes
Seminar leader FE	yes	yes	yes	yes	yes	yes
Seminar controls	yes	yes	yes	yes	yes	yes
Individual controls	yes	yes	yes	yes	yes	yes

Notes: This table summarizes results of regressions of a set of outcome variables (standardized grade, indicator for failing a course, indicator for receiving an honour (one/two) grade) on the seminar-wise leave-me-out share of non-native speakers, the Blau index as measure for linguistic diversity within the group of non-native speakers. Results by language background (English/Non-native) are derived from split sample models. Individual controls contain age, gender, residence status and language background (non-native yes/no). Seminar controls are share of females, number of students and mean age. Significance levels: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Standard errors, clustered at the seminar level, are reported in parentheses.

Second, the initial linguistic composition of classroom has no impact on test scores, or educational choices of English students in subsequent years. For non-native English speakers, being allocated to a classroom with a greater share of non-English students improves their final year grade. A greater linguistic diversity makes non-English students them choose courses that are more popular with native students, reducing segregation by language background. (See paper for details.)

Third, results based on a voluntary alumni survey suggest that these effects spill over to post-graduation outcomes. English students seem to alter their job search efforts and are more likely to invest in post-graduate studies in response to higher shares of non- English students experienced in tutorials. Non-English students have higher probabilities to increase the period of job search in response to higher levels of diversity. (See paper for details.)

Taken together, we show positive effects of first year tutorial diversity on the performance and integration of non-English speakers. Linguistic diversity improves test scores of non-English students and alters their choices of final year courses toward modules that are more popular with English students. These findings suggest that 1) at the current level of internationalisation, there is no negative effects of non-English speakers on the learning of native students 2) diversity improves the learning and integration on non-English students. Longer-term effects based on the graduate survey are suggestively pointing to altered job search effort, though the observation period data 6 months after graduation does not allow to estimate the longer-term effects on realized job matches.

Conclusions

While differences in educational attainment across demographic groups, delineated by gender, ethnicity, and socio-economic background, have been well-documented, much less is known about how education choices are shaped by aspirations and expectations. This is particularly pertinent to higher education where youth (and their parents) make choices from an early age setting them on a path or not toward university studies. Similarly, while a substantial literature has sought to understand how various inputs into the learning environment – e.g. teacher quality, peer quality, and class-size – has been studied at school-level, the role of specific input elements at university level has been less studied.

The current project has sought to make a contribution towards our understanding of aspirations towards university studies, expectations at the point of entry into higher education, and of the role of the learning environment at university.

With respect to aspirations, our main focus was to explore whether aspirations towards higher education of children still in compulsory secondary education was sensitive to university tuition fee policy. Studying the impact of the increase in university tuition fees in 2012-13 affecting English students in particular we found to that the reform lowered the educational aspirations in particular towards A-levels and university studies of children aged 10-15. Moreover, the reform increased the gaps in aspiration between girls and boys and between children from a low and high socio-economic background. The finding that children as young as 10-15 years old are sensitive in their study aspirations to higher education policy is striking and indicative of significant forward-looking behaviour. The

finding that the tuition reform widened the gap in aspirations between children from a low and high socio-economic background speaks directly to the policy discussion regarding the role of policy in relation to changing gaps in higher education participation. Studying aspirations is an important tool for directly measuring the demand side. In this sense our study is strongly complementary to a recent literature that has explored the overall effect of the same tuition fee reform on eventual enrollment where we note that enrollment is an equilibrium outcome reflecting both demand side (student) responses and supply side (university) responses.

To measure expectations of students entering higher education, we created and implemented a survey targeting first year students at Royal Holloway University of London as they entered their studies. We found that overall students' expectations about earnings were well in line with empirical earnings. We further explored how expectations varied by gender and by socio-economic background. The finding that students' expectation are realistic – for instance across subject areas – is an important one in that it young people are making participation and subject choices with a good understanding of the implications for future earnings. In this sense there is little evidence that young people are making ill-informed choices based on systematically biased expectations. It of course also implies that some young people make those choices based in part on non-pecuniary grounds, which has strong implications for what responses can be expected to changes in financial returns.

Finally, in terms of the university environment, we focused on the high degree of internationalism of UK higher education. In particular, we explored whether a higher

share non-native students and/or a larger diversity of non-native students in the classroom had any impact on the performance of both native and non-native students, in the first instance on the module in question. But was also looked ahead at subsequent module choices and also towards post-graduation outcomes. Given the internationalisation of the UK higher education sector, understanding how diversity in the class room affects outcomes and choices of both home and foreign students is central importance to understanding its wider consequences. The evidence put forward here, albeit from a one particular subject at one particular university, suggest that the share and diversity of non-native English speaking students has little impact on the outcomes and choices of native students.

While the results put forward in the current project are by no means comprehensive, they highlight the value of studying aspirations, expectations and inputs in the context of higher education.

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