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Can Perceived Returns Explain Enrollment Gaps in Postgraduate Education?

TEODORA BONEVA, MARTA GOLIN AND CHRISTOPHER RAUH*

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Postgraduate-degree holders comprise a significant share of the workforce and have better labor-market outcomes than workers who only hold a first degree. To understand students' motives to obtain postgraduate qualifications and what drives socioeconomic gaps in this decision, we elicit intentions to pursue postgraduate education and beliefs about its returns in a sample of 1,002 enrolled university students. We document large gaps in perceptions about different immediate and later-life benefits of postgraduate education, both between first- and continuing-generation students and *within* the latter group. Differences in student beliefs about returns across socioeconomic groups can account for 70% of the gaps in intentions to pursue postgraduate studies. We also document large differences in students' current undergraduate experiences by socioeconomic background and find these to be predictive of perceived returns to postgraduate education.

JEL: I24, I26, J13, J24, J62

Keywords: Higher education, beliefs, socioeconomic inequality, intergenerational mobility, postgraduate education

* Boneva: University of Oxford (teodora.boneva@economics.ox.ac.uk). Golin: University of Oxford (marta.golin@economics.ox.ac.uk). Rauh: University of Montreal (christopher.rafael.rauh@umontreal.ca). We thank seminar participants at the University of Montreal and the Tinbergen Institute Amsterdam as well as participants of the briq Workshop on Beliefs, the Warwick Applied Workshop, the Berlin Workshop on Expectations and Decisions and the HCEO SSSI for helpful comments and suggestions. Boneva acknowledges support from the Jacobs Foundation. Golin acknowledges support from the ESRC. Rauh acknowledges support from the SSHRC. Part of this research was conducted during Boneva's visit at the CIREQ Montreal. This study has been approved by the Department's Research Ethics Committee (DREC) at the University of Oxford (Project ID number: ECONCIA18-19-13).

1. Introduction

Over the last decades, wage inequality increased rapidly in many countries around the world including the US and the UK, especially in the upper tail of the wage distribution (Lemieux 2006; Autor, Katz and Kearney 2008; Machin 2011). At the same time, college earnings premia rose steadily while the share of college-educated workers also increased markedly (Mincer 1996; Deschênes 2001; Acemoglu and Autor 2010). Traditionally, studies examining college earnings premia have focused on wage differentials between college-educated workers and workers without a college degree. A growing number of studies focuses on explaining increases in college earnings premia over time as well as what may be driving individual decisions to invest in college education (Katz and Murphy 1992; Card and Lemieux 2001; Carneiro and Heckman 2002; Cunha et al. 2006; Autor, Katz and Kearney 2008; Goldin and Katz 2009; Carneiro and Lee 2011; Boneva and Rauh 2019; Belfield et al. 2019).

More recently, attention has been drawn to the rising wage inequality *within* the group of college-educated workers and the role of postgraduate education in explaining this pattern (Eckstein and Nagypal 2004; Lindley and Machin 2016; Altonji and Zhong 2019). In recent decades, an increasing share of first-degree holders also obtain postgraduate qualifications. At the same time, earnings growth for postgraduate-degree holders has been much steeper than for workers who only hold a first degree.¹ Consistent with this pattern, returns to schooling have become increasingly more convex in years of education (e.g., Lemieux 2006).

Postgraduate-degree holders now comprise a significant share of the workforce. As of 2018, in the US and the UK, around 15% and 14% of employees have postgraduate qualifications (or around 37% of employed first-degree holders in both countries).² They earn significantly more than employees who only have a first degree (see Appendix Figure A.1) and they are over-represented in the upper tail of the earnings distribution. In the UK the share of individuals in the top earnings decile who hold a postgraduate degree is 32%. Given the

¹This pattern has been documented by several different studies, e.g. Eckstein and Nagypal (2004); Autor, Katz and Kearney (2008); Acemoglu and Autor (2010); Lindley and Machin (2016). See Altonji, Arcidiacono and Maurel (2016) for an overview over this literature, and detailed enrollment statistics and returns to graduate degrees in the US.

²See Appendix A for a description of the data.

rising levels of wage inequality and the high intergenerational persistence in earnings, this raises the question of who invests into postgraduate education and what drives individual decisions to obtain a postgraduate degree. Despite the fact that postgraduate-degree holders are the most educated and most highly-skilled group in the population (Lindley and Machin 2016), surprisingly little is known about what drives this educational choice.

In this paper, we aim to fill this gap in the literature and shed light on students' motives to obtain postgraduate education. In order to do so we proceed in three steps. First, we survey a representative sample of 1,002 undergraduate students in England and elicit beliefs about the returns to postgraduate education as well as intentions to enroll in a postgraduate degree. We document individual heterogeneity in perceptions about different immediate and later-life benefits and costs of postgraduate education and investigate whether beliefs differ with the socioeconomic background of the respondent. Second, we estimate a choice model in which we allow for differences in beliefs and preferences across socioeconomic groups and we examine to what extent differences in beliefs about returns can account for the socioeconomic gap in students' intentions to pursue postgraduate education. Finally, we investigate whether students with different socioeconomic background differ in their experiences during their undergraduate studies, and examine whether their actual experiences are predictive of their perceptions about the immediate benefits and costs of continuing to postgraduate education.

We elicit individual beliefs about the returns to postgraduate education using hypothetical investments scenarios. This allows us to overcome the problem that educational choices are consistent with many different combinations of preferences and beliefs (Manski 2004). We elicit individual perceptions about a range of different immediate and later-life outcomes that are of pecuniary and non-pecuniary nature. More specifically, we ask students to imagine scenarios in which they enroll or do not enroll in postgraduate education. We then elicit their perceptions about different immediate outcomes that relate to their lives during the 1-2 years after they finish their undergraduate studies (e.g. enjoyment of social life, enjoyment of study/work). Moreover, we elicit their beliefs about a range of later-life outcomes (at age 35) that relate both to their experience in the labor market (e.g. earnings, probability of being employed) and to a set of non-pecuniary factors (e.g. having a good work-life balance,

being able to contribute to society). To get a better sense of how students experience studying towards their undergraduate degrees, we administer a novel questionnaire designed to capture students' actual experiences.

Several results emerge from our study. First, undergraduate students who are the first generation in their family to go to university state a 5 percentage point lower likelihood of continuing to postgraduate education relative to continuing-generation students. This is consistent with findings from Wakeling and Hampden-Thompson (2013) who document a 4 percentage point gap in progression to postgraduate degrees between students whose parents do and do not have higher qualifications.³ First-generation students in our sample also perceive a range of different benefits of postgraduate education to be lower. This is especially true for the immediate benefits we measure. Second, the estimates of our choice model and results of our decomposition analysis reveal that 70% of the first-generation vs. continuing-generation gap in students' intentions to enroll in a postgraduate degree can be accounted for by differences in beliefs about returns, with the majority of the gap being explained by differences in beliefs about immediate non-pecuniary factors.

We also find striking differences *within* the group of continuing-generation students. Students who have at least one parent with a postgraduate degree state an 8 percentage point higher likelihood of enrolling in a postgraduate degree relative to students who have at least one parent with a first degree, but no parent with a postgraduate degree. Within the group of continuing-generation students, a large share of the gap can be explained by differences in beliefs about parental approval.

Our last set of results relate to students' actual experiences at university. We document that there are sizeable socioeconomic gaps in how students experience their undergraduate life, how they finance their studies, and how they allocate their time across different activities. In particular, first-generation students are significantly less likely to enjoy their coursework, they are less likely to report that they received parental support in their choice to go to university, and are more likely to struggle financially. Interestingly, they are no more likely

³Figures from Wakeling and Hampden-Thompson (2013) refer to immediate progression to postgraduate studies of full-time UK- and EU-domiciled first-degree graduates who successfully completed their studies in the 2009-2010 and 2010-2011 academic years.

to report that they struggle with the material/coursework or find studying stressful. At the same time, first-generation students are more likely to work alongside their studies and the jobs which they engage in are less likely to be related to their studies or help them in their future career. They spend about the same time studying/preparing for lectures but less time taking part in student societies. Finally, students' current experiences are predictive of beliefs about the immediate non-pecuniary benefits of postgraduate education, which is consistent with a theory in which current experiences shape beliefs about likely future experiences.

The socioeconomic gaps in students' experiences draw attention to an important dimension of inequality. First-generation students enjoy many aspects of university life less. This finding is consistent with the results in Boneva and Rauh (2019) who document that secondary school students, who would be the first generation in their family to go to university, perceive the immediate non-pecuniary benefits of going to university as lower compared to students from better educated backgrounds. This raises the question of *why* students' experiences are different and which policies can mitigate this socioeconomic gap. Speculating about potentially effective policies, the fact that first-generation students work more alongside their studies suggests that grants/bursaries could help first-generation students fully take part in student life. Improving students' actual experiences at university may result in more first-generation students wanting to enroll in a first degree and may also shift students' beliefs about their potential experiences during postgraduate education.

Regarding the gaps in students' beliefs about the benefits of postgraduate education, a question which emerges is whether there are actual gaps in the returns to postgraduate education by students' socioeconomic background. Given the socioeconomic differences we find in terms of how students experience their lives as undergraduates, it may very well be that there are also gaps in the returns to postgraduate education, especially when it comes to the immediate non-pecuniary factors. We provide some suggestive evidence on differences in earnings premia by parental education. More research will be needed to understand how the lives of postgraduate students differ and how the later-life benefits of postgraduate education vary with the students' socioeconomic background.

Our study builds on and contributes to several strands of the literature. First, it con-

tributes to the large and growing literature on the role of beliefs in students' decisions to obtain further schooling (e.g. Dominitz and Manski 1996; Jensen 2010; Attanasio and Kaufmann 2014; Kaufmann 2014; Almas et al. 2016; Attanasio and Kaufmann 2017; Boneva and Rauh 2019; Belfield et al. 2019). To the best of our knowledge, we are the first to investigate the role of beliefs in students' decisions to obtain postgraduate education. Closest to our study is the work by Boneva and Rauh (2019) who examine the role of beliefs about pecuniary and non-pecuniary returns in students' decisions to enroll in an undergraduate degree. Second, our study relates to the role of students' beliefs in their choice of major or which specific university to attend (e.g. Arcidiacono, Hotz and Kang 2012; Zafar 2013; Wiswall and Zafar 2015; Hastings et al. 2016; Hastings, Neilson and Zimmerman 2017; Arcidiacono et al. 2017; Wiswall and Zafar 2018; Delavande and Zafar forthcoming). Relative to these studies, we examine an extensive rather than an intensive margin choice in which different considerations are likely to play a role. Third, we contribute to the literature on postgraduate education which has examined postgraduate earnings premia and other benefits of postgraduate education (Eckstein and Nagypal 2004; Lindley and Machin 2016; Gu 2019). Altonji and Zhong (2019) estimate the returns to a broad set of graduate degrees in the US. They document large differences in returns across subject fields and conclude that simple regression-based estimates of returns to graduate degrees can be misleading due to the problem of selection. Relatedly, a number of studies have investigated the returns to specialized postgraduate programs such as MBAs (Graddy and Pistaferri 2000; Arcidiacono, Cooley and Hussey 2008; Bertrand, Goldin and Katz 2010) and medical degrees (Bhattacharya 2005; Chen and Chevalier 2012; Ketel et al. 2016). While these studies examine the benefits of postgraduate education, we contribute to this literature by examining students' motives for obtaining it. Finally, we relate to the literature that investigates which macroeconomic factors play a role in the decision to obtain graduate education. Bedard and Herman (2008) and Johnson (2013) study how graduate-degree enrollment patterns vary across the business cycle. We contribute to this literature by studying individual motives to obtain a graduate degree based on detailed survey data of perceived returns.

This paper is organized as follows. Section 2 presents the model and describes our estima-

tion procedure. Section 3 describes the survey and the methodology we use to elicit students' beliefs. Section 4 provides details on the sample and the survey data we elicit. Section 5 documents socioeconomic differences in students' beliefs and experiences. Section 6 presents the results, while Section 7 concludes.

2. Theory

2.1. The Choice Problem

At time $t = 1$, a student is enrolled in an undergraduate degree. At the end of her undergraduate degree at $t = 2$, student i chooses whether to continue with postgraduate education ($g = 1$) or start working instead ($g = 0$), so as to maximize expected utility.⁴ This utility is derived from continuous outcomes $\{y_m\}_{m=1}^M$, which we think of as earnings once on the labor market and the immediate costs of postgraduate education, as well as a set of N binary outcomes, $\{b_n \in \{0, 1\}\}_{n=1}^N$. The realizations of the different outcomes, which may be of a pecuniary or non-pecuniary nature, depend on the decision of the student to pursue a postgraduate degree. On the one hand, some outcomes are realized in the immediate future, i.e. while the student would or would not be enrolled in a postgraduate degree. On the other hand, other outcomes materialize at a later point in time by which the student has entered the labor market. Examples of immediate outcomes include whether the student enjoys her social life or struggles financially during the 1-2 years following the completion of her undergraduate degree, while examples of later-life outcomes include earnings or whether the student is satisfied with her professional career. Let $\{b_{n_I}^I \in \{0, 1\}\}_{n_I=1}^{N_I}$ and $\{b_{n_L}^L \in \{0, 1\}\}_{n_L=1}^{N_L}$ denote the immediate and later-life binary outcomes respectively, with $N_I + N_L = N$.

Let Z_i be a vector of individual characteristics such as the students' socioeconomic background. We allow students' utility, $U_i(y, b, Z_i)$, to be a function of the pecuniary continuous outcomes, the different binary outcomes as well as individual characteristics Z_i . The individual chooses alternative g so as to maximize her subjective expected utility (SEU). The SEU from choosing alternative g can be written as:

⁴Our modelling approach closely follows Zafar (2013) who investigates what drives gender differences in subject choice.

$$SEU_{ig} = \int U_i(y, b, Z_i) dP_{ig}(y, b)$$

where $P_{ig}(y, b)$ denotes the subjective probability of the outcomes (y, b) occurring if alternative g is chosen. Assuming that utility is additively separable across outcomes, we can rewrite the SEU as:

$$SEU_{ig} = \sum_{n=1}^N P_{ig}(b_n = 1) \Delta u_n(Z_i) + \sum_{n=1}^N u_n(b_n = 0, Z_i) + \sum_{m=1}^M \gamma_m(Z_i) E_{ig}(y_m) + \epsilon_{ig}$$

where $u_n(b_n, Z_i)$ is the utility an individual with characteristics Z_i derives from the binary outcome b_n , $\gamma_m(Z_i)$ is the weight an individual with characteristics Z_i places on expected outcome $E_{ig}(y_m)$ and ϵ_{ig} is a random error term. $\Delta u_n(Z_i)$ captures the difference in utility which arises from the occurrence of the binary outcome b_n for an individual with characteristics Z_i and it is defined as $\Delta u_n(Z_i) \equiv u_n(b_n = 1, Z_i) - u_n(b_n = 0, Z_i)$. In this framework, the utility derived from the vector of outcomes (y, b) can differ across individuals with different characteristics Z_i . This flexible functional form allows us to capture socioeconomic differences in the utility individuals derive from the different outcomes.

To obtain a better understanding of what motivates individuals to enroll in postgraduate education, we elicit individual beliefs using hypothetical investment scenarios. More specifically, we elicit subjective probabilities of the various binary outcomes occurring, $P_{ig}(b_n = 1)$, as well as individual beliefs about expected earnings and immediate costs, $E_{ig}(y_m)$. We elicit those beliefs separately for the scenario in which the student chooses to obtain postgraduate education and the scenario in which the student chooses to complete her education with an undergraduate degree. These beliefs are allowed to be heterogeneous across the population. The parameters to be estimated are the $\Delta u_n(Z_i)$'s and $\gamma_m(Z_i)$'s. In our framework, a student will choose $g = 1$ if the SEU from continuing to postgraduate education exceeds the SEU from not doing so. The probability that $g = 1$ is chosen given student beliefs, $P_{ig}(b_n = 1)$

and $E_{ig}(y_m)$, is given by:

$$\begin{aligned} Pr(g = 1|P_{ig}(b_n = 1), E_{ig}(y)) &= Pr(SEU_{ig=1} \geq SEU_{ig=0}) = \\ &Pr\left(\sum_{n=1}^N [P_{ig=1}(b_n = 1) - P_{ig=0}(b_n = 1)]\Delta u_n(Z_i) + \right. \\ &\left. \sum_{m=1}^M [E_{ig=1}(y_m) - E_{ig=0}(y_m)]\gamma_m(Z_i) \geq \epsilon_{ig=0} - \epsilon_{ig=1}\right). \end{aligned}$$

Using the hypothetical scenarios, we elicit both $P_{ig=1}(b_n = 1)$ and $P_{ig=0}(b_n = 1)$, which are the individual beliefs about the likelihood of outcome b_n occurring given that the student chooses or does not choose to enroll in a postgraduate degree, respectively. Similarly, we elicit both students' expected earnings if their highest qualification is a postgraduate degree, $E_{ig=1}(y_1)$, as well as students' expected earnings if they complete their education with an undergraduate degree, $E_{ig=0}(y_1)$. We also elicit students' perceived immediate costs of postgraduate education, $E_{ig=1}(y_2)$, which are constructed as the sum of expected postgraduate tuition fees and foregone earnings if studying full-time instead of working. We implicitly assume that $E_{ig=0}(y_2) = 0$. Given this information, we can calculate the differences in beliefs across the two states and estimate the parameters of interest.

2.2. Estimation of Choice Model

Under the assumption that the error terms ϵ_{ig} have a Type-I extreme value distribution, we can write the probability of alternative g being chosen as:

$$\begin{aligned} Pr(g = 1|P_{ig}(b_n = 1), E_{ig}(y)) &= Pr(SEU_{ig=1} \geq SEU_{ig=0}) = \\ &\Lambda\left(\sum_{n=1}^N [P_{ig=1}(b_n = 1) - P_{ig=0}(b_n = 1)]\Delta u_n(Z_i) + \sum_{m=1}^M [E_{ig=1}(y_m) - E_{ig=0}(y_m)]\gamma_m(Z_i)\right) \end{aligned}$$

where $\Lambda(\cdot)$ is the logistic function. Only differences in beliefs enter the choice problem and the parameters to be estimated are only identified up to a constant.

The main outcome variable in our analysis is the probability of enrolling in a postgraduate

degree (subject to achieving the necessary grades), which we measure on a 0-100% scale and denote by p_i . We elicit this probability prospectively and estimate the model following the approach proposed by Papke and Wooldridge (1996) as it does not require ad hoc transformations to handle data at the extreme values of 0 and 1. The estimation strategy makes use of the logit link function and the Bernoulli distribution. More specifically, the parameters of the model, which we summarize in the vector β , are estimated by quasi-maximum likelihood, where the Bernoulli log-likelihood function is given by:

$$l_i(\beta) = p_i \log[\Lambda(\cdot)] + (1 - p_i) \log[1 - \Lambda(\cdot)].$$

While the model only predicts values in the interval $0 < p_i < 1$, rather than values at the extremes, because the above equation is a member of the linear exponential family (LEF), the quasi-maximum likelihood estimator (QMLE) of the parameters, obtained from maximizing the quasi-likelihood function $\max_{\beta} \sum_{i=1}^n l_i(\beta)$ is consistent and \sqrt{N} -asymptotically normal, regardless of the conditional distribution of p_i . For fractional data, the Bernoulli QMLE is also efficient in a class of estimators containing all QMLEs in the LEF and weighted non-linear least squares estimators.

2.3. *Belief Formation*

In the estimation of the choice model, we treat individual beliefs about the pecuniary and non-pecuniary returns to graduate education as given. An important question, however, is how these beliefs are shaped. While we will not be able to provide an ultimate answer to this question, we hypothesize that individual beliefs about the immediate non-pecuniary benefits and costs of graduate education may be a function of students' actual experiences of studying towards an undergraduate degree. A student who does not enjoy her social life while being enrolled in an undergraduate degree may perceive it to be less likely that she will enjoy her social life if she decides to enroll in a postgraduate degree. Let L_i be a vector which summarizes individual experiences at university. We can think of L_i as comprising multiple aspects of life at university, such as the extent to which a student enjoys her social

life, enjoys the course work, or obtains parental support in their decision to go to university. We posit that beliefs about the immediate non-pecuniary returns to postgraduate education are a function of those experiences, individual characteristics Z_i and a random component η_i :

$$P_{ig=1}(b_{n_I}^I = 1) - P_{ig=0}(b_{n_I}^I = 1) = f(L_i, Z_i) + \eta_i.$$

To investigate to what extent current experiences are associated with beliefs about returns, we develop a novel survey that allows us to capture student experiences whilst being enrolled in an undergraduate degree.

3. Survey Design

To study students' motives to obtain postgraduate education, we design a survey that we administer to a large representative sample of undergraduate students in England. We survey students prospectively rather than retrospectively to minimize potential biases that could arise from ex-post rationalization. The survey is conducted anonymously and no personal information is collected that would allow us to identify any individual respondents. The survey consists of several different parts, which are described in detail in the following subsections. A full list of questions can be found in Appendix B. Section 3.1 describes how we elicit students' intentions to enroll in a postgraduate degree as well as students' beliefs about their likely future performance. Section 3.2 describes how we use hypothetical investment scenarios to elicit individual beliefs about different immediate and later-life returns to postgraduate education, while Section 3.3 presents the survey module we design to measure students' current experiences at university.

3.1. *Students' Intentions to Obtain Postgraduate Education*

The main outcome variable in our analysis are students' intentions to obtain postgraduate education. To elicit students' intentions, we ask students to state how likely they think it is that they will enroll in a postgraduate degree if they obtain the necessary grades. We

elicit student beliefs using a probabilistic 0-100% scale.⁵ We chose to ask students to state their intentions on a probabilistic scale because that allows individuals to express uncertainty about their decisions. Previous studies have shown that students' self-reported intentions to pursue further education correlate strongly with their actual decisions (e.g., Boneva and Rauh 2019).

In addition to beliefs about the likelihood of enrolling in postgraduate education, we also elicit students' beliefs about the likelihood that they will obtain the necessary qualifications to enroll in a postgraduate degree. More specifically, we ask respondents to state how likely they think it is that they will complete their undergraduate degree and how likely they think it is that they will obtain First-class honors conditional on completing it. We also elicit individual beliefs about the likelihood of graduating conditional on enrolling in a postgraduate degree. This allows us to document whether students from different socioeconomic backgrounds differ in terms of their perceptions of whether they can succeed in obtaining the postgraduate degree of their choice. While the focus of this paper does not lie on understanding what may be driving students' beliefs about their own performance, we use this information to perform robustness checks in which we limit the analysis to only those students for whom enrolling in a postgraduate degree is likely to be a realistic option.⁶

Finally, while we do not model subject choice in this paper, we also ask students to state which subject they would choose if they were to enroll in a postgraduate degree. When we ask students to imagine their lives in the hypothetical scenario in which they enroll in a postgraduate degree, we explicitly make it clear that they should think about enrolling in their subject of choice.

3.2. *Beliefs about Returns to Postgraduate Education*

To elicit student beliefs about the pecuniary and non-pecuniary returns to postgraduate education, we ask students about (the likelihood of) potential outcomes (i) if the student

⁵When using the probabilistic scale, we use sliders to elicit students' beliefs. This question block is preceded by an example question that illustrates the use of the probabilistic scale.

⁶Our results are robust to estimating the choice model on the subsample of students for whom the self-reported probabilities of graduating from their undergraduate degree are above 50%. Results for this robustness check are reported in Table C.12.

continues to postgraduate education and (ii) if the student does not continue to postgraduate education but starts working instead.⁷ For each of these two different scenarios, students are asked about a range of different outcomes, which are summarized in Table 1. We group the outcomes into two categories, namely *immediate outcomes* that are realized during the 1-2 years during which the student may or may not be enrolled in postgraduate education and *later-life outcomes* that are realized when the student has entered the labor market. For the latter, we ask students about potential outcomes at age 35 as this is an age by which most individuals will have completed their education and will have entered the labor market.

Table 1—: Overview of Belief Elicitation Questions

<i>Scenarios</i>	<i>Outcomes</i>
<i>Immediate Outcomes</i>	
(1) If you enrol in your preferred postgraduate degree	Enjoy social life (0-100%)
(2) If you start working	Enjoy study/work (0-100%)
	Feel stressed (0-100%)
	Struggle financially (0-100%)
	Have parental support in your choice (0-100%)
	Exp. tuition fees + foregone earnings
<i>Later-life Outcomes</i>	
(1) Highest qualification is postgraduate degree	Earnings (conditional on working full-time)
(2) Highest qualification is undergraduate degree	Work full time (0-100%)
	Be satisfied with professional career (0-100%)
	Have a high status in society (0-100%)
	Contribute to society (0-100%)
	Have good work-life balance (0-100%)
	Have children (0-100%)

Notes: Students are asked about potential immediate outcomes occurring during the 1-2 years after completing their undergraduate degree as well as potential later-life outcomes relating to their lives at age 35.

To elicit beliefs about immediate outcomes, we ask students to think about what their lives are likely to be like during the 1-2 years after completing their undergraduate degree. We use probabilistic questions to elicit their perceptions about the likelihood of different binary outcomes (see Manski 2004 for a review of this methodology). More specifically, we

⁷We explicitly ask students to think that the alternative is to start working because we did not want students to think about the possibility of doing a gap year before continuing into postgraduate education.

ask students how likely they think it is that they will enjoy their social life, enjoy their study/work, feel stressed, struggle financially and have enough money to do what they enjoy depending on whether they are enrolled in a postgraduate degree or not. We also ask them about their expected earnings if they started to work, the amount they would have to pay in tuition fees if they enrolled in a postgraduate degree, and the probability of having to work alongside their studies if enrolled in a postgraduate degree.

For outcomes at age 35, we ask students what their likely earnings will be (conditional on working full-time) and how likely they think it is that they will be working full-time, depending on whether their highest level of education is a postgraduate degree in the subject of their choice or an undergraduate degree. For each of the two scenarios, we also elicit subjective probabilities about career satisfaction, having a high status in society and contributing to society as well as individual perceptions about the likelihood of having a good work-life balance and having children.

3.3. Student Experiences, Time Allocation and Finances

To measure how students experience studying towards their undergraduate degree, we present students with twelve different statements and ask them to rate to what extent these statements apply to them on a 0-100 scale. The twelve different statements are summarized in Table 2 and relate to students' social lives, their course work, their financial situation, and the support they received from their parents in their decision to go to university. The questionnaire also includes one more general question in which students are asked to state to what extent they agree with the statement that life at university is better than expected. In the analysis, we use students' responses to these questions to provide evidence that students' beliefs about the returns to postgraduate education are associated with students' current experiences at university.

To obtain a clearer picture of students' lives and gain further insights into how the lives of students with different socioeconomic backgrounds differ, we elicit information on how students allocate their time across different activities. In particular, we ask students to think about the previous week and consider how much time they spent on different activities during

that week. We specify that in case the previous week was not a typical week (e.g. because of sickness), students should think of a typical week during term time. More specifically, we ask students how many hours they spent on (i) attending lectures, seminars or tutorials, (ii) studying or preparing for lectures and exams, (iii) participating in student societies, (iv) socializing with friends, (v) working for pay and (vi) working without pay. Students in desperate need for money might be more likely to work unrelated jobs in the low-skilled services industry, while affluent students might be able invest in their future career by focusing on a job's characteristics rather than its pay. Therefore, we also ask students whether the work they do is related to their studies and can help them in their future career. Additionally, we ask about any work they did during the last summer break. In particular, we ask how many weeks they engaged in work during the summer break and whether the work they did was related to their studies. Since differential access to career-related work opportunities might depend on parental networks, we also ask whether their parents knew the employer and helped them with their application.

Table 2—: Overview of University Experience Questions

<i>Category</i>	<i>Questions</i>
Social life	Enjoy social life and activities (0-100) Meet people with whom I get along (0-100) Have little contact with my family / friends from school (0-100) Feel lonely and not part of a group (0-100)
Course material	Enjoy studying for my course (0-100) Find the material covered in my course interesting (0-100)
Stress	Find the material too hard / workload too high (0-100) Feel stressed (0-100)
Financial situation	Struggle financially (0-100) Have enough money to do what I enjoy (0-100)
Parental support	Parental support in decision to go to university (0-100)
Life better than expected	Life at university is better than expected (0-100)

Finally, our data contain detailed information on students' finances. In particular, we ask students to report how much they pay in tuition fees (per year) and how much they spend in a typical month during term time. When reporting their monthly expenses, we ask students

to report the total of their living expenses including rent. To understand how university students finance their studies, we collect information on whether the students took out a loan to pay for their tuition fees and/or their living expenses. In cases in which students report not to have taken out a loan to finance tuition costs, we ask students to identify the sources of funding they use to pay for their tuition fees. In addition, all students are asked to state how much money they use from different sources such as loans, grants, transfers from their parents, personal income from working alongside their studies or personal savings to finance their monthly living expenses. These data allow us to get a better sense of the financial constraints students with different socioeconomic backgrounds face.

4. Data

To examine which motives are important in students' decisions to obtain postgraduate education, we collect primary survey data on a large representative sample of undergraduate students in England. The sample consists of 1,002 university students aged 18-27. The data were collected by a professional survey company in the fall semester 2018.⁸ To be eligible to participate in the study, students had to be at least 18 years old and they had to be currently enrolled in a full-time undergraduate course. The sample was selected to be representative in terms of regions in England. Within each region, we used quota-based sampling to ensure an equal representation of first- and continuing-generation students. Throughout the text we refer to the former group as students from low socioeconomic status, and to the latter group as students from high socioeconomic status. This sampling procedure has the advantage that we have sufficient power to detect differences between the different socioeconomic groups. For each region and socioeconomic group, we sampled an equal number of male and female students. Table C.1 in the Appendix shows the distribution of respondents across regions and compares this distribution to the national distribution of university students across regions in England. As can be seen from the table, the two distributions are very similar.

⁸All participants were part of the company's online panel and participated in the survey online. The survey was scripted in the online survey software Qualtrics. Students received modest incentives for completing the survey. The median time students needed to complete the survey was 10 minutes.

Table 3—: Summary Statistics

	Mean	St. Dev.
First-generation	0.50	0.50
Female	0.50	0.50
Parent with postgraduate degree	0.16	0.37
Age	19.91	1.69
Year	1.95	0.90
Russell Group	0.39	0.49
Private school	0.14	0.35
Home town	0.18	0.39

Notes: First-generation students are defined as those whose parents do not have a university degree. Parent with postgraduate degree is a binary variable equal to one if either parent obtained a postgraduate degree. Year is the year of undergraduate course respondents are currently attending. Russell Group is a binary variable indicating whether the university currently attended by the respondent is part of the Russell Group.

Table 3 shows the characteristics of our sample. By construction, 50% of the undergraduate students in our sample are first-generation students and 50% are women. 16% of all respondents report that they have at least one parent who has obtained a postgraduate degree. On average, participants are 20 years old and they are in the second year of their undergraduate course. They are enrolled at 114 different universities across England.⁹ 39% of the undergraduate students in our sample attend a university that is part of the Russell Group, which is an association of 24 universities in the UK that are considered as leading in research and teaching. 14% of the students in our sample report that they attended a public/independent school before starting university. Unlike state schools, public and independent schools are fee-charging institutions. These numbers are slightly higher than what we find in national statistics: in the UK, 91% of UK-domiciled full-time undergraduate students who enrolled in higher education in 2017-2018 attended a state-funded school, and 28% of all full-time undergraduate students in the UK attended a university that is part of the Russell Group

⁹5% of the students in our sample either did not provide us with information on the university they attend or provided the name of an institution outside England. Our results are robust to dropping those individuals from the analysis (see Table C.11 in Appendix C).

in the academic year 2017-2018. 18% of all students in our sample report that they study in their home town.

There are noteworthy differences across socioeconomic groups. While 47% of continuing-generation students currently attend a university that is part of the Russell Group, the corresponding number is 31% for first-generation students (p -value=0.000). Similarly, 23% of continuing-generation students attended a private secondary school, against a figure of 5% for first-generation students (p -value=0.000).¹⁰ We find no significant differences across socioeconomic groups in terms of whether students study in their home town.

We also ask students to indicate which subject field they are currently studying. Table C.2 in the Appendix shows the distribution of individuals across different subject fields for the whole sample, and separately for first- and continuing-generation students as well as male and female students. The most common fields of study in our sample are Biological Sciences (13.23%) and Social Studies (11.32%), followed by Business and Administrative Studies (10.22%), and Creative Arts and Design (9.92%). Interestingly, there is no significant difference in the distribution of students across subject fields by socioeconomic status (p -value for Pearson's test of equality of distribution=0.656). At the same time, more women study Biological Sciences and Subjects allied to Medicine than men, and more men study Computer Science, or Engineering and Technology (p -value=0.000). This evidence is consistent with the results from other studies documenting that men and women sort into different majors and subject fields (Wiswall and Zafar 2018). When asked about which subject field they would choose, if they were to continue to postgraduate education, 83% of the students in our sample report they would continue to a degree in the same subject field.

5. Student Beliefs and Experiences

5.1. Gaps in Students' Intentions to Obtain Postgraduate Education

To elicit students' intentions to enroll in postgraduate education, we ask students to state how likely they think it is they would enroll in a postgraduate degree if they obtained the

¹⁰In the UK these schools are referred to as public/independent schools.

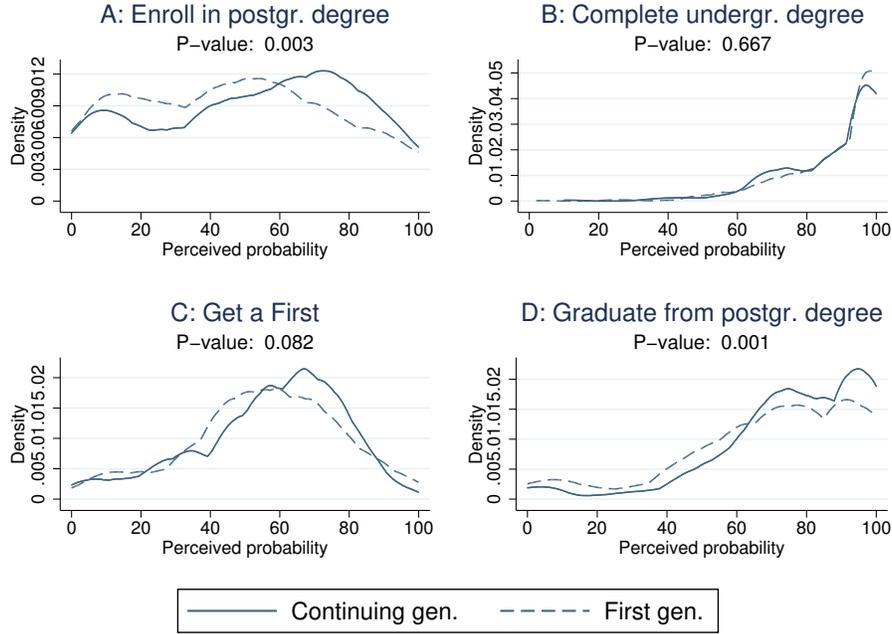
necessary grades. Panel A in Figure 1 shows the distribution of responses to this question, separately for first-generation students (dashed line) and continuing-generation students (solid line). There are several patterns worth noting. First, there is a large amount of heterogeneity in individual responses within both of these groups. While some students seem to be very certain that they would like to pursue a postgraduate degree, other students are unsure about it or almost certain they do not wish to enroll in one. Second, there are significant differences across the two groups, with continuing-generation students stating significantly higher likelihoods of continuing to postgraduate education.¹¹ As can be seen in Table 4, the mean stated likelihood for first-generation students is 47%, while it is 52% for continuing generation students (p -value=0.013). This gap in intentions to enroll cannot be explained by differences in the subjects students study or the universities they currently attend. When we control for subject and university fixed effects, as well as other observable characteristics such as gender and age, we estimate a conditional gap of 4.73 percentage points in students' intentions to enroll, which is remarkably similar to the unconditional gap (see Table 4 column 6).

In addition to eliciting students' beliefs about how likely they are to enroll in a postgraduate degree if they get the grades, we also elicit students' perceptions about the likelihood they will complete their undergraduate degree, the probability they will obtain First-class honors if they graduate, as well as the likelihood they will graduate if they enroll in a postgraduate degree. When we compare the responses of first- and continuing-generation students, we find no significant differences in students' average beliefs regarding the likelihood they will complete their undergraduate degree or graduate with First-class honors (see Table 4). We do, however, find that first-generation students perceive the likelihood of graduating from a postgraduate degree to be about 6 percentage points lower (p -value=0.000). In Panels B-D of Figure 1, we depict the distributions of individual responses to these three questions, separately for first- and continuing-generation students.

The distinction between first- and continuing-generation students is arguably a relevant one and captures important differences in terms of socioeconomic background. At the same

¹¹The Kolmogorov-Smirnov test of equality of distributions rejects the null hypothesis that the two distributions are the same at the 1% level.

Figure 1. : Differences in Beliefs by Parental Education



Notes: The different panels depict the kernel densities of individual beliefs about the likelihood of enrolling in a postgraduate degree (Panel A), graduating from their undergraduate degree (Panel B), getting a First in their undergraduate degree (Panel C), and graduating from their postgraduate degree (Panel D). The densities are depicted for first-generation students (dashed line) and continuing-generation students (solid line), respectively. Reported p-values are from Kolmogorov-Smirnov tests of equality of distributions.

time, it masks an additional source of potentially relevant heterogeneity, which is that some of the parents of continuing-generation students also have postgraduate qualifications. Given the focus of this paper, we also study whether continuing-generation students who have at least one parent with a postgraduate degree have different beliefs compared to continuing-generation students whose parents do not have postgraduate qualifications (see Table 5 and Figure C.1). The differences across these two groups are striking. Students whose parents hold a postgraduate qualification report a 8.2 percentage point higher probability of enrolling in a postgraduate degree, compared to continuing-generation students whose parents only have an undergraduate degree. Again we find that this gap cannot be explained by differences in subject choice or the university students attend. The conditional gap we estimate

Table 4—: Differences in Beliefs by Parental Education

Belief	All	Parental background			P-value	Cond. Gap
		First	Continuing	Diff		
Enroll postgr. degree	49.38 [29.97]	47.02 [29.57]	51.74 [30.20]	-4.72 (1.89)	0.013	-4.727** (2.18)
Complete undergrad. degree	88.67 [14.67]	89.22 [14.54]	88.12 [14.79]	1.09 (0.93)	0.239	0.188 (1.04)
Get a First	56.08 [21.77]	55.46 [22.04]	56.69 [21.50]	-1.23 (1.38)	0.372	-1.241 (1.58)
Complete postgr. degree	73.60 [24.55]	70.61 [26.16]	76.61 [22.44]	-5.99 (1.54)	0.000	-6.129*** (1.71)

Notes: Standard deviations given in square brackets, standard errors given in round brackets. This table separately provides mean beliefs for the whole sample (Column 1), by whether at least one parent has a degree (Columns 2 and 3), the unconditional difference in beliefs between first- and continuing-generation students (Column 4), and the conditional difference in beliefs (Column 6). Column 2 refers to first-generation students, whilst Column 3 refers to continuing-generation students. P-values for a test of difference in means are provided in Column 5. The conditional gaps refer to the coefficients of a first-generation-student dummy variable, in an OLS regression where each belief variable is regressed on the first-generation dummy, a gender dummy, age of the respondent, and university and subject fixed effects.

is in fact somewhat larger than the unconditional gap (9.9 percentage points). Regarding perceived performance, we find some differences in students' perceptions about the probability of completing their undergraduate degree but no differences in beliefs regarding the probability of obtaining First-class honors or completing the postgraduate degree. Once we control for individual characteristics as well as subject and university fixed effects, we find no significant differences in any of the three perceived performance measures.

How do students' average beliefs compare to actual statistics on enrollment and performance? On average, students state a 49% likelihood of enrolling in a postgraduate degree if they get the grades (Table 4). Using data from the Quarterly Labour Force Survey, we document that 37% of employed first-degree holders also hold postgraduate qualifications (see Appendix A). Consistent with data on actual continuation rates, we find students' intentions to enroll in postgraduate education to be heterogeneous across subjects. In our sample, the reported probability of enrolling in a postgraduate degree spans from 19% and 34% for students currently studying Veterinary Science or Medicine and Dentistry to 58% for students studying Physical Sciences (see column 6 of Table C.2). This is in line with the data

presented in Wakeling and Hampden-Thompson (2013), which show that Physical Sciences is the subject area with the highest progression rate towards postgraduate degrees, whereas Medicine and Dentistry is the discipline with the lowest.

Table 5—: Differences in Beliefs by Parental Education - Continuing-generation Students

Belief	All	Parental background			P-value	Cond. Gap
		No postgr.	Postgr.	Diff		
Enroll postgr. degree	51.74 [30.20]	49.05 [29.86]	57.26 [30.24]	-8.20 (2.86)	0.004	-9.922*** (3.41)
Complete undergr. degree	88.12 [14.79]	87.11 [15.23]	90.21 [13.65]	-3.11 (1.40)	0.027	-2.099 (1.66)
Get a First	56.69 [21.50]	57.66 [21.27]	54.70 [21.90]	2.97 (2.04)	0.147	1.700 (2.61)
Complete postgr. degree	76.61 [22.44]	75.49 [22.35]	78.90 [22.53]	-3.41 (2.14)	0.112	-2.595 (2.84)

Notes: Standard deviations given in square brackets, standard errors given in round brackets. The sample is restricted to continuing-generation students. This table separately provides mean beliefs for the whole sample (Column 1), by whether at least one parent has a postgraduate degree (Columns 2 and 3), the unconditional difference in beliefs between the two groups (Column 4), and the conditional difference in beliefs (Column 6). Column 2 refers to students whose parents do not have a postgraduate degree, whilst Column 3 refers to students for whom at least one parent has a postgraduate degree. P-values for a test of difference in means are provided in Column 5. The conditional gaps refer to the coefficients of a dummy variable for whether at least one parent has a postgraduate degree, in an OLS regression where each belief variable is regressed on the parental education dummy, a gender dummy, age of the respondent, and university and subject fixed effects.

Turning to average beliefs about performance, students believe there is a 89% chance they will complete their undergraduate degree. This estimate is fairly consistent: in the UK, the percentage of full-time first-degree students who are projected not to obtain a degree ranges between 10.1% and 10.7% for full-time first-degree students starting their undergraduate degree in 2011 or after (Higher Education Statistics Agency 2018). Interestingly, students in our sample seem very optimistic about their performance in terms of final grades obtained for their undergraduate degree. On average, students believe that the likelihood of obtaining First-class honors conditional on graduating is 56%. In the UK, conditional on starting a degree and graduating, only 28% of all full-time first-degree qualifiers obtain First-class

honors, while 49% obtain Upper Second-class honors (2.1) and 23% obtain Lower Second-class honors (2.2) or Third-class honors (Higher Education Statistics Agency 2019b).

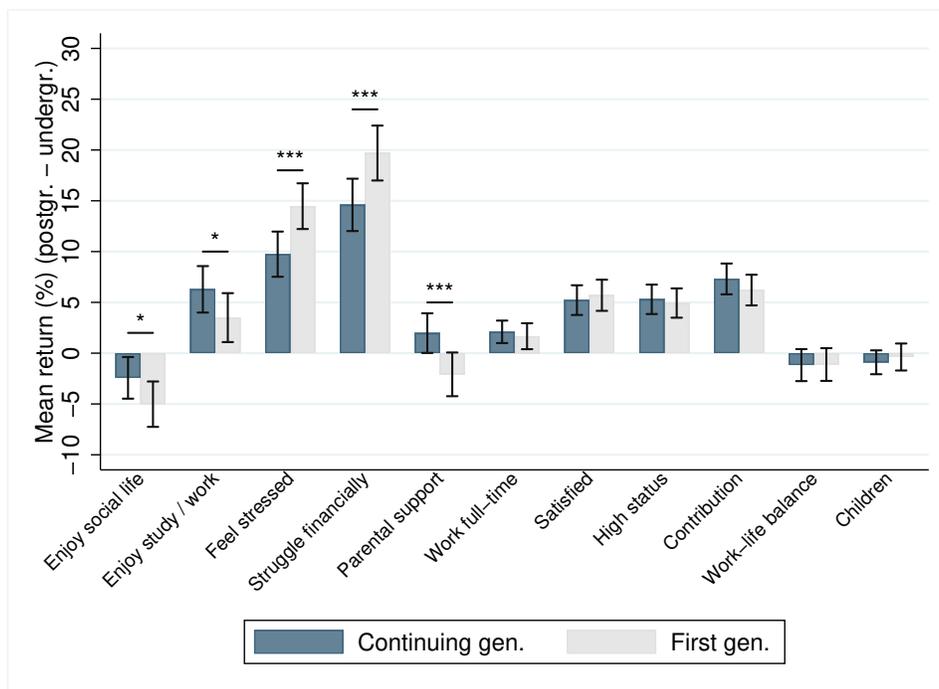
5.2. *Heterogeneity in Perceived Returns*

To understand what may be driving the socioeconomic gaps in enrollment rates, we investigate whether students from different backgrounds perceive the immediate and later-life outcomes of postgraduate education as different. We first examine how first- and continuing-generation students perceive the immediate returns to postgraduate education. Panel A of Table 6 shows the average stated likelihoods in each of the two scenarios for the different binary outcomes we elicit, both for the whole sample as well as separately for first- and continuing-generation students. Figure 2 shows the mean difference in beliefs by SES for all binary outcomes.

Looking at differences across socioeconomic status, we note that both low and high SES students report a lower probability of enjoying their social life in the 1-2 years after graduating from the undergraduate degree if they pursue a postgraduate degree compared to the scenario in which they start working instead.¹² The gap is significantly larger for low SES students. However, both groups of students also report a higher probability of enjoying what they do if they enroll in a postgraduate degree. Individuals are also more likely to report they will feel stressed and struggle financially if they continue on to a postgraduate degree, with perceived costs being significantly larger for low SES students. However, we note that no significant differences between first- and continuing-generation students exist in the self-reported probability of having to work alongside their studies. Furthermore, low SES students report lower costs of postgraduate education, calculated as the sum of expected tuition fees and foregone earnings (see also Figure C.4 in Appendix C). It is worth mentioning that, unlike undergraduate studies, tuition fees for postgraduate degrees are not capped and vary significantly across universities and subject fields. Furthermore, governmental student loans for masters courses have only been introduced in the academic year 2016-2017, and are

¹²These results contrast with the findings in Boneva and Rauh (2019) who find that both low and high SES secondary school students believe their social lives will improve on average if they enroll in an undergraduate degree instead of starting to work instead.

Figure 2. : Returns to Postgraduate Education by Parental Education



Notes: The Figure shows average perceived difference in the probability of immediate and later-life binary outcomes between obtaining a postgraduate degree or only obtaining an undergraduate degree by first-generation students (gray bars) and continuing-generation students (blue bars). The black caps represent 95% confidence intervals and stars indicate statistical significance of differences by parental background: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

limited to a maximum of £10,609 (for 2018-2019) for the entire duration of the course.¹³ Before the introduction of postgraduate student loans, around 80% of first-degree qualifiers progressing to postgraduate degrees were self-funding their studies (Wakeling and Hampden-Thompson 2013). Strikingly, even concerns about parental support unrelated to finances show large differences. While high SES students report they will be more likely to have parental support if they continue with their education, the opposite holds true for low SES students, and the difference across socioeconomic groups is highly significant. It is worth noting that the perceived parental support for continuing-generation students is driven by

¹³Government loans for doctoral studies have been introduced for courses starting in or after 1 August 2018, for a maximum of £25,000.

the subgroup of students whose parents have a postgraduate qualification.¹⁴

We then analyze the self-reported likelihood of outcomes at age 35, as well as expected earnings at age 35 conditional on working full-time. Panel B of Table 6 shows mean beliefs for outcomes at age 35 for the full sample as well as separately for first- and continuing-generation students. The outcomes refer to the two scenarios in which the highest educational qualification is an undergraduate or postgraduate degree, respectively. Both first- and continuing-generation students expect a higher income at age 35 if they obtain a postgraduate qualification. On average in our sample, expected earnings are £41,863 and £48,332, for the scenarios in which the highest educational qualification is an undergraduate and a postgraduate degree, respectively. We note that the difference in earnings across the two scenarios for continuing-generation students is significantly higher than for first-generation students. While we cannot comment on the accuracy of students' beliefs regarding pecuniary returns to postgraduate education, we have information on realized differences in earnings around age 35 across workers with different educational qualification. Data from the LFS show that full-time employees around age 35 on average earn £39,932 and £43,637 if their highest qualification is an undergraduate or postgraduate degree, respectively. We also compare perceived monetary returns to postgraduate earnings premia observed in the UK Household Longitudinal Study for individuals aged 32-38 in waves 6-8, corresponding to the period between 2014 and 2018. More concretely, we estimate postgraduate earnings premia for the sample of respondents with at least a first degree or equivalent and employed full-time, and allow these returns to differ by parental education. We classify respondents as first generation if at least one of their parents has a university degree or higher, and take as dependent variable annual gross labour earnings. Results from this exercise are reported in column 1 of Table 7, and show that the average earnings premium for university-educated workers with a postgraduate qualification and aged around 35 years in the UK is £6035.23. Further, we note that the interaction coefficient between being a first-generation student and having a postgraduate degree is negative at £2892.62 but not significant. We compare the observed

¹⁴The difference in perceived support between the two subgroups of high SES students is significant at the 1% level. See Table C.3 for the full set of results for the continuing-generation group.

earnings premium with perceived returns for students in our sample (see column 2 of Table 7). To compute the perceived returns, we consider two observations per respondent. The first observation refers to the scenario in which the highest educational qualification achieved is an undergraduate degree, and the second refers to the case in which the student successfully completes a postgraduate degree. The dependent variable is expected earnings at age 35, conditional on working full-time. Results show that the average perceived return to a postgraduate degree for students in our sample is £7218.25. The interaction between postgraduate qualification and first generation is negative and significant at £1496.44. We further note that the perceived earnings difference for first-generation students with an undergraduate degree compared to their continuing-generation counterpart is negative and significant at £3052.03 in our data, and significant albeit smaller in magnitude in the UK HLS data. Turning to returns about non-pecuniary later-life outcomes, both first- and continuing-generation students in our sample report a higher likelihood of being satisfied with their career, having a high status in society and being able to contribute to society if they obtain a postgraduate qualification. No significant differences are found, for either group, in the likelihood of having a good work-life balance or having children at age 35. We find no significant differences by SES for these later-life non-pecuniary returns.

We also look at differences in perceived returns for both immediate and later-life outcomes, between the subsamples of continuing-generation students whose parents did and did not complete postgraduate education (see Table C.3 in Appendix C). Results show that the only significant difference in terms of immediate outcomes is in perceived parental support if they do or do not enroll in a postgraduate degree. While continuing-generation students, whose parents do not have postgraduate qualifications, think it less likely that their parents will approve of their choice if they continue to higher education than if they start working instead, the opposite holds true for students who have at least one parent with postgraduate qualifications. Looking at outcomes at age 35, students whose parents have a postgraduate degree perceive a larger difference in earnings and in the probability of having a high status in society if they continue with a postgraduate degree compared to the other continuing-generation students.

Table 6—: Mean Beliefs for Immediate and Later-Life Outcomes by Parental Education

Belief	All			First generation			Continuing generation			Diff-in-diff
	Undergr	Postgr	Diff	Undergr	Postgr	Diff	Undergr	Postgr	Diff	
<i>Panel A: Immediate Outcomes</i>										
Enjoy social life	63.13 [21.00]	59.41 [21.65]	-3.72 0.000	61.92 [21.52]	56.90 [22.67]	-5.02 0.000	64.35 [20.43]	61.92 [20.30]	-2.43 0.020	-2.59* (1.54)
Enjoy study / work	63.53 [21.64]	68.42 [21.01]	4.89 0.000	63.15 [22.10]	66.65 [21.96]	3.50 0.004	63.92 [21.18]	70.20 [19.87]	6.28 0.000	-2.78* (1.69)
Feel stressed	61.37 [23.34]	73.47 [21.79]	12.11 0.000	59.99 [24.39]	74.46 [22.22]	14.47 0.000	62.74 [22.18]	72.49 [21.33]	9.74 0.000	4.73*** (1.61)
Struggle financially	42.94 [26.53]	60.09 [26.49]	17.15 0.000	41.78 [26.68]	61.48 [27.09]	19.70 0.000	44.09 [26.35]	58.69 [25.83]	14.60 0.000	5.10*** (1.90)
Parental support	79.00 [24.02]	78.94 [24.26]	-0.06 0.938	78.50 [25.25]	76.41 [26.35]	-2.09 0.057	79.51 [22.74]	81.48 [21.70]	1.97 0.048	-4.06* (1.48)
Immediate cost	0 -	36433.62 [13646.17]	36433.62 0.000	0 -	35330.33 [13879.05]	35330.33 0.000	0 -	37539.12 [13331.21]	37539.12 0.000	-2208.79* (860.23)
<i>Panel B: Later-Life Outcomes</i>										
Earnings	41862.98 [17473.99]	48332.26 [17841.25]	6469.28 0.000	40329.15 [17641.39]	46050.96 [17776.08]	5721.80 0.000	43399.88 [17185.27]	50618.12 [17629.89]	7218.25 0.000	-1496.44* (714.05)
Work full-time	83.65 [18.06]	85.54 [17.43]	1.89 0.000	84.31 [18.60]	85.98 [17.96]	1.67 0.010	82.99 [17.50]	85.10 [16.88]	2.10 0.000	-0.43 (0.86)
Satisfied with career	68.94 [19.75]	74.40 [17.65]	5.46 0.000	69.01 [21.03]	74.71 [18.64]	5.70 0.000	68.87 [18.40]	74.09 [16.61]	5.22 0.000	0.48 (1.08)
High status	54.25 [23.94]	59.37 [23.45]	5.12 0.000	52.54 [24.10]	57.47 [23.54]	4.93 0.000	55.96 [23.69]	61.26 [23.23]	5.30 0.000	-0.37 (1.04)
Contribution	65.46 [22.66]	72.22 [20.95]	6.76 0.000	65.43 [23.35]	71.64 [21.29]	6.21 0.000	65.49 [21.98]	72.80 [20.61]	7.31 0.000	-1.10 (1.09)
Work-life balance	63.78 [20.67]	62.64 [21.14]	-1.15 0.046	62.69 [21.58]	61.57 [21.47]	-1.12 0.173	64.88 [19.66]	63.70 [20.77]	-1.17 0.144	0.06 (1.15)
Children	61.99 [31.20]	61.35 [30.33]	-0.64 0.157	61.99 [32.14]	61.61 [31.06]	-0.38 0.576	62.00 [30.26]	61.10 [29.62]	-0.90 0.134	0.52 (0.90)

Notes: Standard deviations given in square brackets, standard errors given in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. This table provides mean beliefs for the whole sample and by the education level of the respondent's parents. Columns 1-3 provide results for the whole sample. Columns 4-6 are for respondents for whom neither parent went to university, while Columns 7-9 are for respondents for whom at least one parent went to university. Within each group, the first two columns give mean beliefs for the respective characteristic under the scenarios of having an undergraduate or postgraduate degree as highest qualification respectively. Mean beliefs are given on a 0-100 scale other than for expected earnings and immediate costs, which are in pounds. The third column gives the mean difference between these two beliefs, with the p-value for a t-test of difference in means reported underneath. Column 10 (Diff-in-diff) gives the average difference for respondents for whom neither parent has a degree minus the average difference for respondents for whom at least one parent has a degree.

Table 7—: Observed and perceived returns to postgraduate education in terms of annual earnings

	UK HLS	Beliefs
Postgraduate degree	6,035.23*** (1,843.65)	7,218.25*** (499.58)
First gen. × Postgr. degree	-2,892.62 (2,205.56)	-1,496.44** (714.39)
First generation	-2,425.18* (1,406.90)	-3,052.03*** (1,085.34)
Female	-7,263.81*** (1,026.56)	-6,218.86*** (1,033.45)
Constant	39,476.86*** (1,313.95)	46,471.99*** (894.83)
Observations	1,108	2,002
R-squared	0.086	0.074

Notes: The first column is estimated using waves 6-8 of the UK Household Longitudinal Study. The sample is restricted to individuals aged 32-38 with at least a first degree or equivalent and employed full time. The dependent variable is total gross annual labour earnings (averaged over the period of observation), for individuals who report strictly positive earnings. We control for age distance from 35. The second column is estimated using our sample while taking each individual twice, once for each scenario. OLS estimation technique is used. Standard errors in parentheses, and clustered at the individual level in column 2. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

5.3. Heterogeneity in Students' Current Experiences

Next we investigate how students from different backgrounds differ in how they experience university education. To elicit information on students' current experiences, we ask students to state to what extent different statements apply to them on a 0-100 scale. For the purpose of this analysis, we group the survey items into six different categories, as summarized in Table 2, and construct summary indices by extracting a factor from the different item responses in each category.¹⁵ Figure 3 displays the mean values of the extracted factors separately for

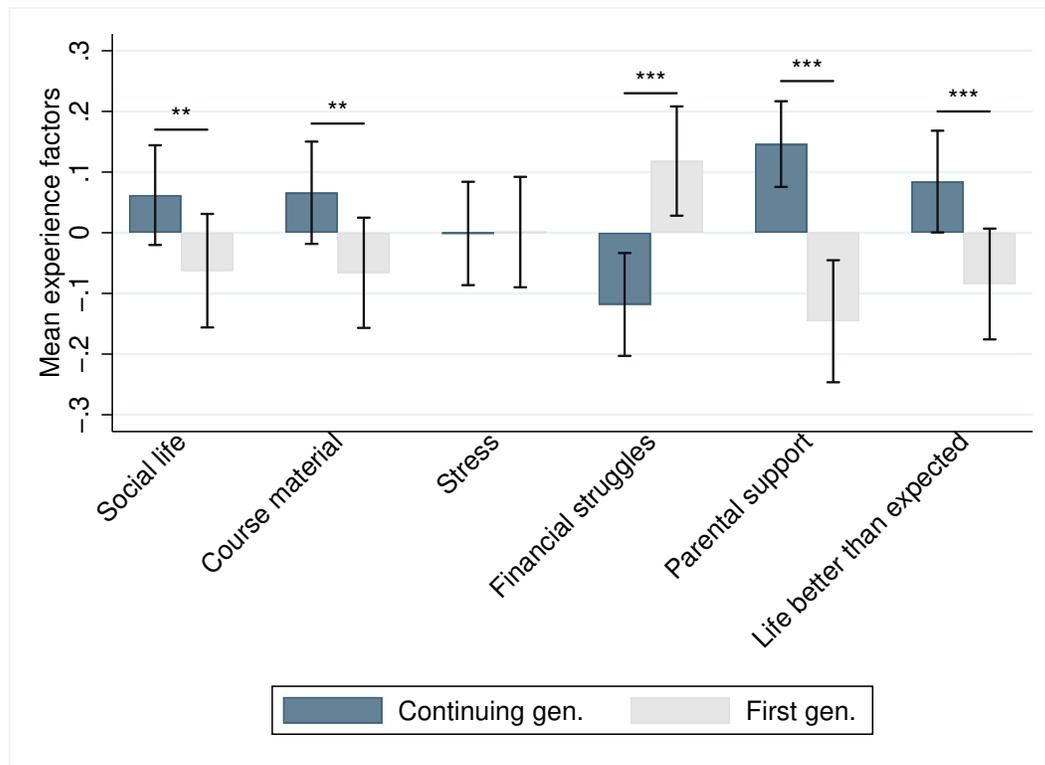
¹⁵Tables C.4 and C.5 in Appendix C report the average answers to how much each single statement about life at university applies to the respondents, on a 0-100 scale, for the full sample and for the subgroup of continuing-generation students. Breakdowns by parental education are also provided in both tables.

first- and continuing-generation students. The factors measure the extent to which students have a good social life, enjoy their course work, find studying hard/stressful, struggle financially, benefit from parental support and think their life is better than expected. We find significant differences by socioeconomic status in how students perceive their life at university. Continuing-generation students are more likely to enjoy their course work, and they are more likely to report that life at university is better than expected. High SES students are also more likely to state that they have parental approval in their choice to go to university, and they are less likely to struggle financially. Among continuing-generation students, students whose parents have postgraduate qualifications on average report significantly higher levels of parental support but are also less likely to state that their life is better than expected (see Figure C.6 in Appendix C).

Finally, we look at how students allocate their time across various activities in a typical week during term time, and how they finance their tuition fees and living expenses.¹⁶ In a typical week, students in our sample spend an average of 12 hours attending lectures, seminars or tutorials, 12.8 hours preparing for lectures and exams, 2.2 hours participating in student societies, 11.1 hours socializing with friends, 3.8 hours working for pay and 0.6 hours working without pay (see Table C.6 in Appendix C). 34% of respondents work for pay for at least one hour/week, and 9% report working without pay. Conditional on working (either for pay or not for pay), students spend on average 11.6 hours per week on their job. First-generation students work more than continuing-generation students, with 13.5 and 9.9 hours per week spent working, respectively. This difference is driven by first-generation students spending significantly more hours than continuing-generation students working for pay. First-generation students are less likely to engage in work that is related to their studies or that will help them in their future career than their continuing-generation counterpart. There are also other differences in the way students allocate their time in a typical week during term time. First-generation students spend less time in student societies compared to high SES students. Among continuing-generation students, we find that those whose parents have

¹⁶For each activity or money source, values above the 99th percentile are considered as outliers and are not included in the analysis. We also exclude respondents who indicated zero hours spent on all activities or no money coming from all sources.

Figure 3. : Experience of Life at University by Parental Education



Notes: The figure shows the average value for the first factor from a factor analysis of the variables related to the social life, positive and negative aspects of the course work and financial situation, as well as the standardized variables for having parental support and perceiving life at university as better than expected. Parental background is split between students who have at least one parent with university education (blue bars) and those who do not (gray bars). The black caps represent 95% confidence intervals and stars indicate statistical significance of differences by parental background: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

a postgraduate degree spend more of their time socializing with friends (see Table C.7 in Appendix C). When looking at work that students did over the last summer break, we find that continuing-generation students worked a smaller number of weeks, but the work that they did was more likely to be related to their studies compared to the work first-generation students engaged in. Furthermore, parents of continuing-generation students were more likely to know the employer their children were working for, and to help them with their application for the job. These findings suggest that continuing-generation students might have advantages by being able to use their parental network to access career-oriented jobs

without focusing on pay due to the lack of a tight budget constraint.

Turning to the ways in which students finance their tuition fees and living expenses, 88% of the students in our sample took out a loan to pay for their tuition fees. The average masks large heterogeneities by socioeconomic status. Indeed, while only 82% of continuing-generation students took out a loan, the corresponding figure for the low SES group is 95%. Out of those who report not to have taken out a loan, 77% report their parents contribute towards their tuition. Large socioeconomic gaps in financial support from parents or family exist in our sample, with 50% and 85% of first- and continuing-generation students respectively reporting being helped financially by their family (see Table C.8 in the Appendix). On average, students spend around £600 each month to cover their living expenses (including rent). First-generation students drive the average down, spending £552 per month on average. Students mostly finance their monthly expenditures using money from loans (£501) and family (£213), although students who are the first in their family to go to university receive significantly less money from their family than high SES students do, and rely instead on more money from bursaries and grants. Among continuing-generation students, those whose parents hold a postgraduate degree are less likely to use money from work to pay towards their tuition fees, if they did not take up a loan (see Table C.9 in Appendix C).

6. Results

In the following, we first estimate the choice model presented in Section 2, and discuss results under the assumption of homogeneous preferences (Section 6.1). We investigate the relative importance of expected earnings and the different non-pecuniary factors in the decision to pursue a postgraduate education. We then estimate the choice model separately for first- and continuing-generation students (Section 6.2) and examine to what extent the socioeconomic enrollment gap can be explained by differences in beliefs and preferences (Section 6.3). We also focus on the sample of continuing-generation students and estimate the model separately for those students whose parents do and do not hold a postgraduate qualification in order to understand what may be driving the gaps *within* continuing-generation students. Finally, we investigate whether individual characteristics and students' current

experiences are predictive of students' beliefs about the immediate returns to postgraduate education (Section 6.4).

6.1. *Homogeneous Preferences*

Column 1 of Table 8 presents the estimation results assuming homogeneous preferences.¹⁷ Several non-pecuniary aspects that relate to students' lives during the 1-2 years after finishing their undergraduate degree significantly predict students' plans of pursuing a postgraduate education. Perceived returns in terms of enjoying one's social life, one's study/work, and parental support significantly and positively predict the perceived likelihood of enrolling in a postgraduate degree. We look at the relative magnitudes of the coefficients, $\{\Delta u_n\}_{n=1}^N$, to get a sense of the importance of each binary outcome in the choice. The most important immediate factor for students in our sample is enjoying their study/work during the 1-2 years after finishing their undergraduate degree followed by having parental support. These results highlight the importance of perceived immediate non-pecuniary factors in students' educational investment decisions, and are consistent with findings from Zafar (2013), Belfield et al. (2019) and Boneva and Rauh (2019) that non-pecuniary motives drive students' decisions about their education. However, budget constraints play a role as well. We find that concerns about struggling financially as well as the expected immediate costs, i.e. sum of expected tuition fees and foregone earnings, are negatively related to students' plans to enroll in a postgraduate course.

Looking at binary outcomes at age 35, what matters most is whether students will be satisfied with their professional career, and whether they will have a high status in society. In contrast, the point estimate for the weight placed on contributions to society is exactly zero. Concerns about family formation seem to play a role as well as the perceived possibility of having children also positively correlates with the decision to enroll in a postgraduate degree. Finally, we find that pecuniary returns at age 35 (i.e. expected earnings conditional on working full-time) matter for students' decisions about postgraduate education. Overall, the

¹⁷Tables C.10 and C.11 in Appendix C show that our results are robust to excluding outliers and students whose current university is not in England, respectively. For each return variable, we consider those observations as outliers that are in the top and bottom percentile of the return distribution.

results suggest that both perceived immediate and perceived later-life returns to postgraduate education are important in students' choices.

To provide a clearer interpretation of the magnitudes of our parameter estimates, we calculate the willingness to pay for each binary outcome, which can be interpreted as how much of yearly earnings at age 35 a student would be willing to forgo for a one-percentage-point change in the probability of the binary outcome n occurring:

$$(1) \quad WTP_n = \frac{0.01\Delta u_n}{\gamma_1}$$

Here one has to bear in mind that the computed amount a student would be willing to sacrifice can probably be interpreted as a lower bound, as we use perceived earnings at age 35 as a sufficient statistic for future earnings. Perceived higher earnings at age 35 would most likely be related to higher earnings at later ages, so in discounted-value terms one £ at age 35 probably translates into a lot more. The sufficient-statistic view neglects potential differences in beliefs about future earnings growth. However, adding additional questions to capture earnings growth would have lengthened and complicated the survey substantially. We also calculate the willingness to pay for expected immediate costs that accrue when pursuing a postgraduate degree. This captures the amount of age 35 earnings that students would have to be compensated with, for a one £ increase in the immediate costs of pursuing a postgraduate education, and is calculated as $\frac{\gamma_2}{\gamma_1}$. We see that students would be willing to trade-off £0.70 in immediate costs for a one £ increase in earnings at age 35. Ignoring the previously discussed caveat of potential earnings gains at other ages for a moment, given that our average student is aged 20 this corresponds to a discount rate of 0.976.

Willingness-to-pay estimates for other outcomes are reported in column 2 of Table 8 and expressed in units of £.¹⁸ Our results indicate that students are willing to accept a substantially lower income for a one-percentage-point change in the probability of several non-pecuniary immediate outcomes. For example, students are willing to forgo £1099 for a one-percentage-

¹⁸Standard errors of these non-linear combinations of estimators are calculated using the Delta method.

point increase in the probability of enjoying what they do in the 1-2 years after their undergraduate degree, and £961 for an equivalent change in the probability of having parental support in their choice. Finally, students are also willing to accept £696 and £539 lower earnings for a one-percentage-point increase in the probability of being satisfied with their professional career and having a high status in society at age 35, respectively. These results highlight the economic relevance of non-pecuniary factors in the choice.

6.2. *Heterogeneous Preferences by SES*

We now turn to the question of whether students from low and high SES backgrounds differ in their preferences over the different attributes. For this purpose, we split the sample by whether or not students have at least one parent who attended university, and we estimate the choice model separately for the two groups. Results are reported in columns 3-6 of Table 8. We find sizeable differences in the point estimates of the preference parameters we estimate, although most of these differences are statistically insignificant (see columns 7-8 of Table 8), possibly due to a lack of power. Nonetheless, some notable patterns emerge. For example, expected earnings and career satisfaction at age 35 only seem to matter for continuing-generation students, whereas low SES students place more weight on enjoying their social life and not feeling stressed in the 1-2 years after the completion of their undergraduate degree. Interestingly, despite perceiving a lower immediate cost of postgraduate education, first-generation students' intentions to enroll in a postgraduate degree significantly depend on their expected costs of such investment, while this is not the case for continuing-generation students. This suggests that for first-generation students budget constraints might be binding, while for continuing-generation students they appear not to be.¹⁹

Finally, we investigate whether, among high SES students, differences exist in their preferences over the different attributes based on whether their parents obtained postgraduate education or not. For this purpose, we focus on the subsample of continuing-generation students, split the subsample by whether or not students have at least one parent who holds a

¹⁹We note that the probability of working full-time at age 35 negatively enters the choice model for first-generation students. This result is driven by the subsample of female respondents that are the first-generation in their family to go to university.

postgraduate qualification, and estimate the choice model separately for these two subgroups. The results are reported in columns 3-6 of Table 9. Although most of the differences between the estimated preference parameters are again statistically insignificant (see columns 7-8 of Table 9), we note that students from the highest socioeconomic background seem to place more weight on whether they will be satisfied with their career at age 35 and whether they will have a good work-life balance. Parental support, on the other hand, plays a significant role in the choice of high SES students whose parents do not have a postgraduate degree, but does not significantly enter the choice model for students whose parents went through postgraduate education.

Table 8—: Choice Model Estimation by Parental Education

	All		First generation		Continuing generation		Difference (p-value)	
	Coef.	WTP	Coef.	WTP	Coef.	WTP	Coef.	WTP
Expected earnings at age 35 ($10000\gamma_1$)	0.11*** (0.035)	-	0.05 (0.050)	-	0.16*** (0.052)	-	0.112	
Enjoy social life (Δu_1)	0.46** (0.189)	436.19* (235.809)	0.76*** (0.238)	1579.53 (1739.925)	0.18 (0.292)	113.41 (186.623)	0.127	0.402
Enjoy study / work (Δu_2)	1.17*** (0.181)	1099.16*** (393.728)	0.92*** (0.237)	1907.53 (1977.259)	1.57*** (0.264)	969.14*** (342.676)	0.066	0.640
Feel stressed (Δu_3)	-0.29* (0.151)	-276.49* (164.518)	-0.38* (0.217)	-782.57 (877.688)	-0.25 (0.229)	-154.68 (150.170)	0.691	0.480
Struggle financially (Δu_4)	-0.53*** (0.135)	-497.24** (211.642)	-0.47** (0.193)	-983.54 (1075.540)	-0.50*** (0.193)	-309.40* (161.128)	0.916	0.535
Parental support (Δu_5)	1.02*** (0.184)	961.16*** (364.967)	0.91*** (0.248)	1887.34 (2063.910)	1.10*** (0.282)	679.26** (272.930)	0.606	0.562
Immediate cost ($10000\gamma_2$)	-0.07*** (0.023)	-0.70** (0.291)	-0.10*** (0.031)	-2.16 (2.267)	-0.03 (0.033)	-0.17 (0.202)	0.089	0.380
Work full time at age 35 (Δu_6)	-0.38 (0.296)	-359.35 (302.505)	-1.04*** (0.400)	-2169.23 (2469.673)	0.32 (0.402)	200.45 (263.400)	0.016	0.340
Satisfied with career at age 35 (Δu_7)	0.74*** (0.283)	695.95* (378.771)	0.56 (0.420)	1171.92 (1634.558)	1.00*** (0.369)	618.44** (314.782)	0.433	0.739
High status at age 35 (Δu_8)	0.57** (0.257)	538.74 (332.903)	0.61 (0.374)	1268.97 (1646.168)	0.51 (0.371)	312.24 (271.960)	0.844	0.566
Contribute to society at age 35 (Δu_9)	0.00 (0.259)	0.91 (244.086)	0.51 (0.383)	1061.49 (1396.199)	-0.47 (0.358)	-287.87 (230.547)	0.063	0.340
Work-life balance at age 35 (Δu_{10})	0.37 (0.241)	345.00 (254.639)	0.19 (0.334)	403.90 (836.742)	0.53 (0.333)	325.82 (223.980)	0.479	0.928
Have children at age 35 (Δu_{11})	0.64** (0.301)	605.90* (363.428)	0.17 (0.447)	353.36 (1044.094)	0.97** (0.395)	597.67* (317.704)	0.181	0.823
Graduate postgr.	0.40*** (0.126)	380.61** (178.122)	0.59*** (0.164)	1237.76 (1343.538)	0.09 (0.189)	56.09 (118.871)	0.044	0.381
Observations	989	989	495	495	494	494		
Variance explained	0.270		0.286		0.282			

Notes: Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Column 1 presents the estimates of the choice model for the whole sample, while column 2 presents the willingness-to-pay calculations. Columns 3-4 present the results for first-generation students, columns 5-6 present the results for continuing-generation students. For the willingness to pay calculations, standard errors are calculated using the delta method. Continuing-generation students are defined as those students who have at least one parent with university education. The last row reports the R-Squared from a regression of the dependent variable on the fitted values predicted by our model.

Table 9—: Choice Model Estimation by Parental Education - Continuing-generation Students

	Continuing gen.		Parents no postgr. qual.		Parents have postgr. qual.		Difference (p-value)	
	Coef.	WTP	Coef.	WTP	Coef.	WTP	Coef.	WTP
Expected earnings at age 35 ($10000\gamma_1$)	0.16*** (0.052)	-	0.19*** (0.068)	-	0.13* (0.080)	-	0.585	
Enjoy social life (Δu_1)	0.18 (0.292)	113.41 (186.623)	0.16 (0.389)	86.58 (209.002)	0.25 (0.433)	188.59 (362.859)	0.884	0.807
Enjoy study / work (Δu_2)	1.57*** (0.264)	969.14*** (342.676)	1.62*** (0.334)	858.86** (351.109)	1.61*** (0.443)	1222.81 (793.382)	0.982	0.674
Feel stressed (Δu_3)	-0.25 (0.229)	-154.68 (150.170)	-0.52* (0.306)	-277.21 (187.853)	0.25 (0.344)	187.54 (284.651)	0.094	0.172
Struggle financially (Δu_4)	-0.50*** (0.193)	-309.40* (161.128)	-0.56** (0.265)	-293.92 (178.699)	-0.48* (0.285)	-360.96 (338.011)	0.837	0.861
Parental support (Δu_5)	1.10*** (0.282)	679.26** (272.930)	1.09*** (0.328)	578.77** (272.188)	0.81 (0.564)	612.89 (526.644)	0.660	0.954
Immediate cost ($10000\gamma_2$)	-0.03 (0.033)	-0.17 (0.202)	-0.01 (0.040)	-0.04 (0.212)	-0.09 (0.062)	-0.71 (0.579)	0.243	0.275
Work full time at age 35 (Δu_6)	0.32 (0.402)	200.45 (263.400)	0.05 (0.537)	25.15 (284.605)	0.86 (0.637)	651.90 (672.274)	0.329	0.390
Satisfied with career at age 35 (Δu_8)	1.00*** (0.369)	618.44** (314.782)	0.72 (0.486)	383.18 (297.662)	1.35** (0.601)	1020.89 (824.295)	0.421	0.466
High status at age 35 (Δu_8)	0.51 (0.371)	312.24 (271.960)	0.40 (0.448)	212.64 (264.946)	0.42 (0.645)	322.20 (581.497)	0.977	0.864
Contribute to society at age 35 (Δu_9)	-0.47 (0.358)	-287.87 (230.547)	-0.42 (0.511)	-224.39 (271.064)	-0.44 (0.533)	-337.12 (459.056)	0.978	0.832
Work-life balance at age 35 (Δu_{10})	0.53 (0.333)	325.82 (223.980)	0.34 (0.450)	182.12 (247.172)	0.98* (0.505)	740.21 (576.807)	0.350	0.373
Have children at age 35 (Δu_{11})	0.97** (0.395)	597.67* (317.704)	1.00** (0.467)	528.29 (344.277)	0.80 (0.743)	607.38 (603.986)	0.821	0.909
Graduate postgr.	0.09 (0.189)	56.09 (118.871)	-0.04 (0.234)	-22.17 (123.126)	0.51 (0.333)	386.61 (357.016)	0.174	0.278
Observations	494	494	331	331	163	163		
Variance explained	0.282		0.254		0.356			

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Notes: Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Column 1 presents the estimates of the choice model for the subsample of continuing-generation students, while column 2 presents the willingness-to-pay calculations. Columns 3-4 present the results for continuing-generation students whose parents do not hold a postgraduate qualification, columns 5-6 present the results for continuing-generation students whose parents hold a postgraduate qualification. For the willingness to pay calculations, standard errors are calculated using the delta method. Continuing-generation students are defined as those students who have at least one parent with university education. The last row reports the R-Squared from a regression of the dependent variable on the fitted values predicted by our model.

6.3. Decomposition of Gaps in Enrollment

The results presented in Sections 5 and 6 point to two explanations for why we observe gaps in intentions to enroll in a postgraduate degree between students from different socioeconomic backgrounds. First, results from the choice model suggest that students from different socioeconomic backgrounds may have different preferences over the different factors. Second, depending on their background characteristics, students hold different beliefs about the returns to postgraduate education in terms of both pecuniary and non-pecuniary outcomes, especially for outcomes that accrue in the immediate future. To the extent that beliefs are malleable and possibly formed on the basis of incorrect or incomplete information, it is important to quantify how much differences in beliefs contribute to the socioeconomic gaps in people's intention to pursue postgraduate education. In other words, in this section we calculate how much the gaps would be reduced if everyone in our sample had the same beliefs about the different pecuniary and non-pecuniary returns to postgraduate education.

For this purpose, we use the estimates from Section 6.2 to calculate the gaps in intentions to enroll that our model predicts, and decompose these gaps into a composition effect and a preference effect (or coefficients effect). The former captures the effect of differences in the distribution of our covariates (i.e. beliefs about the returns to postgraduate education) across groups, while the latter captures the effect of differences in preference-parameter estimates. Denote as G_i the socioeconomic group student i belongs to, where $G_i = L$ for first-generation students and $G_i = H$ for continuing-generation students. Further let X_i be a vector of all the perceived returns that enter our choice model estimation, and β be the vector of preference parameters associated to the different returns. The gap in our outcome variable predicted by the model can be written as:

$$\Delta^{SES} = \underbrace{E[\Lambda(X_i\beta^H)|G_i = H] - E[\Lambda(X_i\beta^L)|G_i = H]}_{\Delta^\beta \text{ (preference effect)}} + \underbrace{E[\Lambda(X_i\beta^L)|G_i = H] - E[\Lambda(X_i\beta^L)|G_i = L]}_{\Delta^X \text{ (composition effect)}}$$

We first look at the gap between first- and continuing-generation students, and then focus on differences by parental background for the sample of continuing-generation students in

isolation. When we perform the decomposition exercise using the parameter estimates obtained for first- and continuing-generation students, results show that our model including perceived returns to postgraduate education 1-2 years after graduation and at age 35 predicts a socioeconomic gap in students' intentions to continue to a postgraduate degree of 3.9 percentage points, which corresponds to 75% of the actual gap (the actual, unconditional gap by SES is 5.2 percentage points in the sample of respondents for whom we have non-missing information for all the returns). Furthermore, the decomposition analysis shows that of the 3.9 percentage-point SES gap predicted by the model, 93% can be explained by socioeconomic differences in beliefs (composition effect), and the remaining 7% can be explained by differences in preferences. These results are graphically illustrated in Figure 4. Putting the numbers together, we find that differences in beliefs about the returns to postgraduate education across socioeconomic groups can explain 70% of the actual gap in students' intentions to enroll in postgraduate education.

We further investigate which beliefs play the dominant role in explaining the gaps in intentions to enroll in a postgraduate degree, by SES. To do this, we follow Kaiser (2015) and, for each perceived return, we examine by how much the socioeconomic gap would be reduced if the distribution of beliefs was the same across low and high SES students, keeping the distributions for all other outcomes constant.²⁰ In other words, we decompose Δ^X into the contributions from each explanatory variable by examining how switching the value of variable n for first-generation individual i with $G_i = L$ with that of continuing-generation individual j with $G_j = H$, holding her preference parameters (β^L) constant, affects the conditional-expectation function for the outcome of interest. The conditional contribution of variable n is defined as

$$\Delta_n^X(X_i, X_j) = \frac{\Lambda(X_j\beta^L) - \Lambda(X_i\beta^L)}{(X_j - X_i)\beta^L} (X_{jn} - X_{in})\beta_n^L$$

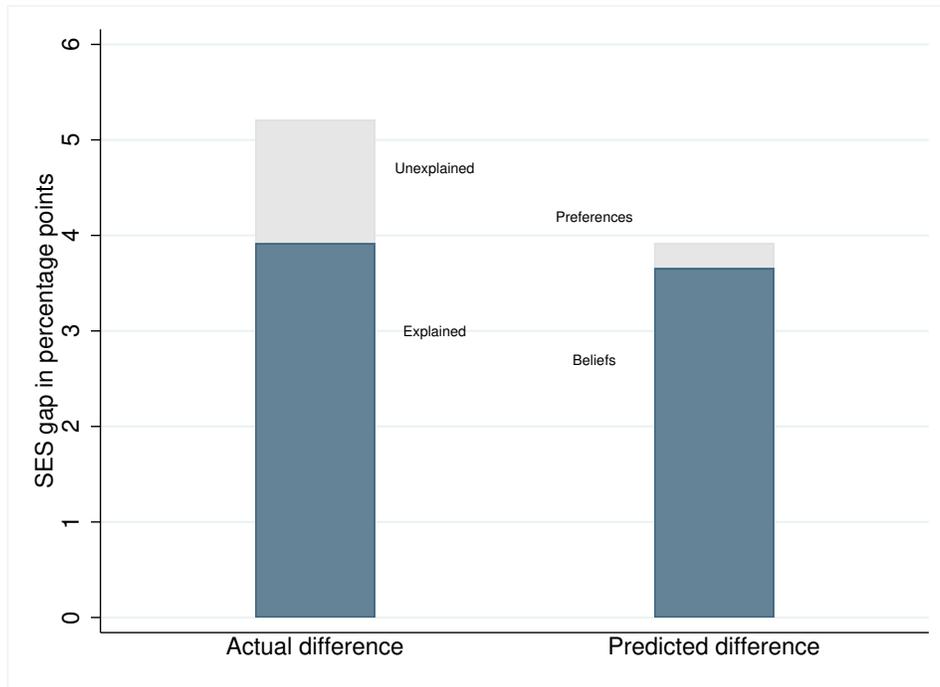
and the unconditional contribution is then obtained by integrating $\Delta_n^X(X_i, X_j)$ over the dis-

²⁰This approach has the advantage of taking into account the impact of differences in higher order moments of X_i , not only differences in means, and of ensuring path independence.

tribution of covariates in the two groups. The results from this exercise are presented in columns 1 and 2 of Table 10. Looking at the decomposition of the SES gap, we note that shifting the distribution of beliefs about enjoying the activity students will be doing in the 1-2 years after graduation would reduce the SES gap by 0.66 percentage points, whereas differences in beliefs about the likelihood of struggling financially can account for 0.55 percentage points of the SES gap in intentions to enroll in a postgraduate degree. Beliefs about parental support also play a vital role in explaining the gap between first- and continuing-generation students, which would be reduced by 0.92 percentage points if first- and continuing-generation students held the same beliefs. We note that students' perceptions about their professional career and status in society at age 35 do not drive differences in intentions to pursue a postgraduate education. Finally, neither differences in beliefs about earnings at age 35 nor about employment can explain socioeconomic differences in enrollment into postgraduate education. Taken together, the results suggest that the driving factors behind gaps in enrollment are differences in beliefs regarding the immediate non-pecuniary benefits of postgraduate education.

We repeat the exercise looking at the continuing-generation subsample only and decomposing the gap between students whose parents have a postgraduate qualification and students whose parents only have an undergraduate degree. Results for this exercise are presented in columns 3-4 of Table 10. The actual gap in intentions to enroll that we observe in the subsample of students for whom we have non-missing information about all the returns is 8.04 percentage points. Our model that accounts for differences in perceived returns and differences in preferences predicts a gap in intentions to enroll of 8.74 percentage points, which is more than the actual gap observed in the data. The decomposition analysis shows that 53% of the gap predicted by the model can be explained by differences in beliefs alone (composition effect). We note that none of the coefficients from the decomposition analysis apart from the one associated with parental support are significant at conventional levels, possibly due to a lack of power. Interestingly, the single most important factor in explaining gaps in intentions to enroll among continuing-generation students are beliefs about whether or not they would have parental approval in their choice. Shifting the distribution of beliefs of

Figure 4. : Decomposition of Predicted SES Gap in Intentions to Enroll



Notes: SES is split by whether at least one parent has university education. The first column decomposes the actual difference between low and high SES students' intention to enroll in a postgraduate degree into that which can be predicted by the model and that which is unexplained. The second column decomposes the predicted SES gap into differences in preferences and differences in beliefs.

students whose parents did not obtain postgraduate education would reduce the gap by 2.68 percentage points. The second most important factor are beliefs about whether students will enjoy what they will be doing in the 1-2 years after completing their undergraduate degree. Differences in the distribution of this perceived return account for 1.04 percentage points of the gap within continuing-generation students.

Table 10—: Decomposition of Predicted Gaps in Intentions to Enroll

	Gap by SES		Gap by postgr. qual.	
	Gap	P-value	Gap	P-value
Actual gap	5.212	0.006	8.036	0.005
Total predicted gap	3.916	0.044	8.740	0.002
Composition effect	3.655	0.001	4.633	0.011
	Coef.	P-value	Coef.	P-value
Expected earnings at age 35 ($10000\gamma_1$)	0.174 (0.202)	0.388	0.749 (0.565)	0.185
Enjoy social life (Δu_1)	0.571 (0.343)	0.096	0.035 (0.260)	0.894
Enjoy study / work (Δu_2)	0.659 (0.389)	0.090	1.038 (0.928)	0.264
Feel stressed (Δu_3)	0.409 (0.311)	0.188	-0.084 (0.380)	0.826
Struggle financially (Δu_4)	0.549 (0.339)	0.105	-0.396 (0.438)	0.366
Parental support (Δu_5)	0.919 (0.393)	0.020	2.680 (0.943)	0.004
Immediate cost ($10000\gamma_2$)	-0.491 (0.324)	0.130	-0.001 (0.122)	0.992
Work full time at age 35 (Δu_6)	-0.119 (0.224)	0.596	0.022 (0.330)	0.946
Satisfied with career at age 35 (Δu_7)	-0.041 (0.163)	0.803	0.381 (0.421)	0.366
High status at age 35 (Δu_8)	0.050 (0.169)	0.769	0.374 (0.487)	0.442
Contribute to society at age 35 (Δu_9)	0.119 (0.183)	0.514	-0.193 (0.362)	0.593
Work-life balance at age 35 (Δu_{10})	-0.005 (0.103)	0.964	0.045 (0.256)	0.859
Have children at age 35 (Δu_{11})	-0.029 (0.122)	0.813	0.011 (0.294)	0.969
Graduate postgr.	0.888 (0.360)	0.014	-0.028 (0.207)	0.893

Notes: The relative contributions of beliefs to the predicted gaps in enrollment by SES for the full sample, and by whether or not at least one parent has a post-graduate degree for the subsample of continuing-generation students are presented in columns 1 and 3 respectively. Columns 2 and 4 presents p-values for a test of significance of the coefficients. The first three rows of the table report, for each model, the actual gap observed in the data, the total gap predicted by our model, and the gap predicted from the composition effect. Bootstrapped standard errors calculated from 500 repetitions are provided in parentheses.

6.4. *Determinants of Perceived Returns*

Given the importance of beliefs about the immediate non-pecuniary benefits and costs of postgraduate education in students' decisions to enroll in a postgraduate degree, a natural question to ask is whether individual characteristics and experiences are predictive of these beliefs. Table 11 shows the results from regressing individual perceived returns on students' characteristics (first generation, whether at least one parent has a postgraduate qualification, age, gender), the student's self-reported probability of getting a First in her undergraduate degree, the extracted factors capturing students' current experiences at university which we describe in Section 5.3, as well as field of study and university fixed effects.

Consistent with a model in which current experiences shape students' beliefs about future experiences, we find that the coefficients associated to variables capturing undergraduate experiences are positive and significant along the main diagonal, i.e. the more one statement applies during undergraduate years, the more likely students think it will also apply during their postgraduate education. For example, students who report that they currently enjoy their social life are also more likely to believe that the return to enrolling in a postgraduate degree in terms of their social life is going to be greater. Similarly, students who currently enjoy studying towards their degree also believe that the return in terms of enjoying what they will do will be higher. However, having parental approval in their choice of pursuing a first-degree does not lead students to believe their parents will also support them if they continued with postgraduate education. Perceiving life at university as better than expected is correlated with a higher perceived benefit in terms of enjoying one's social life and lower perceived costs in terms of stress and financial struggles.

Looking at differences in beliefs by background characteristics, we note that female students report a higher probability of being stressed and struggling financially if enrolling in a postgraduate degree versus not, but also a higher likelihood of enjoying what they will be doing. Having at least one parent with postgraduate qualification and the self-reported probability of getting a First in their undergraduate degree are positively and significantly

correlated with the perceived degree of parental approval if pursuing a postgraduate degree.²¹

Table 11—: Determinants of Perceived Returns 1-2 Years after Graduation

	Social life	Study / work	Stressed	Struggle	Parents
First generation	0.002 (0.019)	-0.010 (0.022)	0.026 (0.020)	0.026 (0.024)	-0.004 (0.020)
Parent with graduate degree	0.041 (0.026)	0.041 (0.029)	-0.028 (0.028)	0.014 (0.032)	0.121*** (0.025)
Get a First	0.048 (0.046)	0.076 (0.050)	-0.024 (0.050)	-0.074 (0.056)	0.087* (0.047)
Female	-0.019 (0.018)	0.032* (0.019)	0.052*** (0.019)	0.050** (0.023)	-0.006 (0.018)
Age	0.001 (0.005)	0.007 (0.006)	-0.005 (0.005)	0.011* (0.007)	-0.007 (0.005)
Social life	0.019* (0.010)	-0.011 (0.011)	0.030*** (0.011)	0.035*** (0.013)	0.004 (0.011)
Course material	0.006 (0.011)	0.052*** (0.012)	-0.014 (0.011)	0.010 (0.013)	-0.008 (0.010)
Stress	-0.012 (0.009)	-0.010 (0.010)	0.029*** (0.010)	0.003 (0.011)	0.010 (0.009)
Financial struggles	0.004 (0.009)	0.016 (0.011)	-0.001 (0.010)	0.083*** (0.012)	0.009 (0.010)
Parental support	-0.019** (0.009)	-0.014 (0.011)	0.009 (0.010)	0.022* (0.012)	0.015 (0.010)
Life better than expected	0.036*** (0.011)	0.002 (0.013)	-0.033*** (0.011)	-0.027** (0.013)	0.002 (0.012)
Observations	962	961	961	961	961
R Squared	0.222	0.237	0.217	0.248	0.187
University fixed effects	Y	Y	Y	Y	Y
Subject fixed effects	Y	Y	Y	Y	Y

Notes: Robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. All dependent variables are beliefs about returns (postgraduate - work), see overview of elicited beliefs about returns in Table 1. Social life, course material, stress, and financial situation refer to the first factor from the related variables.

²¹For brevity, we do not report results for the determinants of perceived returns at age 35 of postgraduate education, for which we find little relation to current experiences.

7. Conclusion

In this paper, we investigate to what extent differences in beliefs about the returns can explain the observed gap in intentions to obtain postgraduate education across socioeconomic groups. To answer this question, we collect novel survey data from a representative sample of undergraduate students in the UK. We elicit students' beliefs about the pecuniary and non-pecuniary benefits of postgraduate education, both in the immediate future and later in life, as well as students' intentions to pursue a postgraduate degree. By surveying students prospectively, we minimize biases that can arise due to ex-post rationalization. We also administer a questionnaire that is designed to capture students' actual experience of life at university. This allows us to investigate whether students with different background characteristics differ in their experience of studying towards their undergraduate degree and whether current experiences are predictive of students' beliefs about the immediate non-pecuniary returns to postgraduate education.

We document that undergraduate students, who are the first generation in their family to go to university, state a 5 percentage point lower likelihood of continuing on to postgraduate education relative to continuing-generation students. They also perceive a range of both pecuniary and non-pecuniary returns to postgraduate education to be lower, and this is especially true for returns that would accrue within the 1-2 years of postgraduate studies. Differences in beliefs about the returns to postgraduate education can explain 70% of the observed first-generation/continuing-generation gap in students' intentions to enroll in a postgraduate degree. We also find that the majority of the gap can be explained by differences in beliefs about immediate non-pecuniary outcomes.

We document that large heterogeneities in intentions to enroll in a postgraduate degree exist *within* the continuing-generation group. Students who have at least one parent who holds a postgraduate qualification report an 8 percentage point higher likelihood of pursuing postgraduate education relative to the group of students whose parents have an undergraduate qualification, but not a postgraduate degree. We find that the single most important factor that drives this gap in students' intentions to obtain postgraduate education is parental approval. Finally, we document that there are sizeable differences in how students from different

backgrounds experience their lives at university, and that these differences are predictive of the perceived returns to postgraduate education.

Taken together, the results from this paper shed new light on the growing debate on what drives socioeconomic differences in educational attainment. The socioeconomic gaps we find in students' actual experiences at university are alarming and raise the question of what governments and universities can do to narrow these socioeconomic gaps in actual student experiences. It will also be crucial to understand whether the socioeconomic gaps in students' beliefs about the benefits of postgraduate education are reflective of actual differences in the returns to postgraduate education by socioeconomic status. More research will be needed into whether and potentially why the returns to postgraduate education differ across socioeconomic groups and which policies could be effective in narrowing the gaps in returns to postgraduate education.

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APPENDIX A: SUPPLEMENTARY DATA

UK DATA

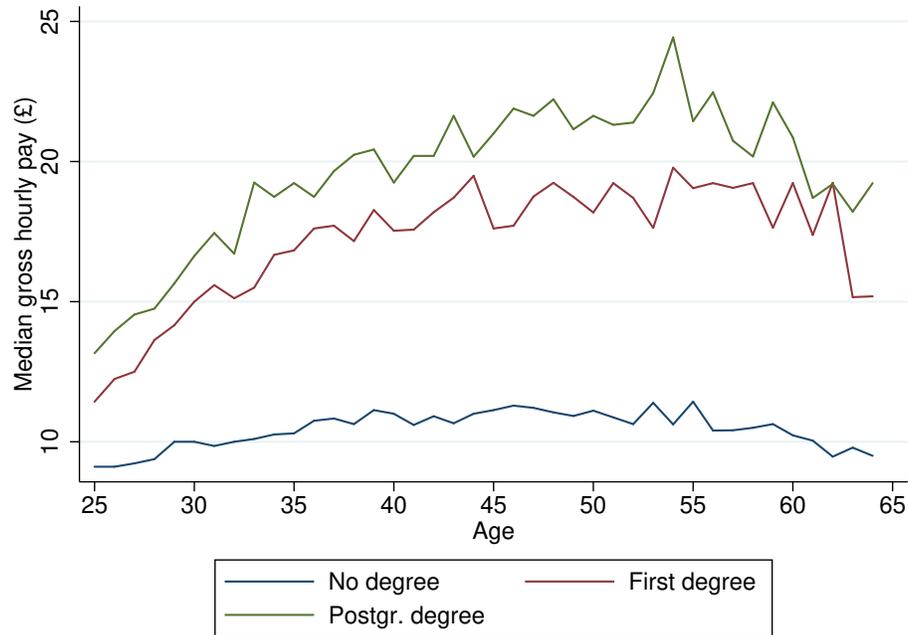
Data on labour market outcomes and composition of the workforce for the UK come from the quarterly Labour Force Survey (LFS), from Q1 2018 to Q4 2018. The sample includes all first-time respondents aged 25-64 included, who are not in full-time study and for whom information on their highest educational qualification is available. We classify First degrees and other equivalent degrees as “First degree”, all higher qualifications as “Post-graduate degree”, and other non-university qualifications as “No degree”. Shares of the workforce by educational qualification are calculated for the full sample. The top decile is calculated from the distribution of gross hourly pay, which is available for employees and individuals in government schemes. Income weights, as provided in the LFS dataset, are used throughout.

Table A.1—: Education Shares by Educational Qualification

	Full sample	Age 25-40	Top decile
No degree	64.13	56.31	28.56
First degree only	22.70	28.49	39.77
Post-graduate degree	13.18	15.20	31.67

Notes: The table provides the breakdown of all employees aged 25-64 (Column 1) and of those aged 25-40 (Column 2), by highest educational qualification obtained. Column 3 reports the breakdown by educational qualification of employees in the top decile of the gross hourly pay distribution. Source: QLFS (2016-2018), first-time respondents aged 25-64 in employment, excluding full-time students.

Figure A.1. : Gross Hourly Pay by Educational Qualification



Notes: The figure shows median gross hourly pay from the main job by age, for individuals with no university degree, a first degree only and a postgraduate degree respectively. The sample is restricted to individuals aged 25-64 included, who are first-time respondents to the QLFS and employed. We exclude full-time students. Source: QLFS, from Q1 2016 to Q4 2018. Data are weighted with the income weights provided in the QLFS.

US DATA

Figures for the US come from <https://www.bls.gov/cps/lfcharacteristics.htm#laborforce>. Data on characteristics of the labour force come from the Current Population Survey (CPS), and refer to the population of employed individuals, 25 years and over. We classify Bachelor's degree holders as "First degree", individuals with advanced degrees as "Post-graduate degrees", and any qualification lower than a Bachelor's degree as "No university degree". Figures refer to annual averages for 2018.

APPENDIX B: QUESTIONNAIRES

B1. Experience Questionnaire

Think about your life at university. To what extent do the following statements apply to you? You can select any number between 0 and 100.

- I enjoy the social life and activities I engage in.
- I meet people with whom I easily get along with.
- I have little contact with my family and friends from school.
- I sometimes feel lonely and not part of a group.
- I enjoy studying for my course.
- I find the material covered in my course interesting.
- I find the material too hard and/or the workload too high.
- I am stressed and sometimes feel that I cannot cope.
- I struggle financially.
- I have enough money to do what I enjoy.
- My parents supported me in my decision to go to university.
- Life at university is better than expected.

B2. Time Allocation

Now we would like to ask you how much time you spend on different activities. Think about last week and consider which activities you engaged in. If last week was not a typical week (e.g. because of sickness) please think of a typical week during term time. How many hours did you spend on the following activities? (enter hours per week)

- Attending lectures/seminars/tutorials
- Studying/preparing for lectures and exams
- Participating in student societies
- Socialising with friends
- Work/internship (for pay)
- Work/internship (not for pay)

[If working at least 1 hour per week, either for pay or not for pay] To what extent do the following statements apply to you?

- The work I do alongside my studies is closely related to the subject I study.
- The work I do alongside my studies will help me in my future career.

Think about the last summer break. How many weeks did you engage in work / internships?

[If worked at least one week] On a scale from 0 to 100, how related was this job to your studies?

[If worked at least one week] Did your parents know your employer or somebody working for the same employer?

[If worked at least one week] Did your parents help you write your application?

B3. Finances

Now we would like to ask you some questions about your current expenses and how you finance your undergraduate studies.

Did you take out a loan to finance your tuition fees? [Yes, No]

[If 'No' selected] How do you finance your tuition fees? (select all which apply)

- Money from parents/family
- Work alongside my studies
- Savings
- Other sources

In a typical month during term time, how high are your living expenses (including rent)? [amounts in £]

Did you take out a loan to finance your living expenses? [Yes, No]

In a typical month during term time, how much money do you use from the following sources to finance your living expenses (including rent)? [amounts in £]

- Loans
- Grants/scholarships/bursaries
- Parents/family

- Working alongside studies
- Savings
- Other sources

B4. Plans for the Future

How likely do you think it is that you will complete your undergraduate degree?

Assuming that you complete your undergraduate degree, how likely do you think it is you will get a First?

Assuming that you get the necessary grades, how likely do you think it is you will enrol in a postgraduate degree?

If you enrol in a postgraduate degree, how likely do you think it is you will graduate?

Which field of study would you be most likely to choose?

B5. Hypothetical Scenarios

Now we would like you to think about the 1-2 years of your life that will come after you complete your undergraduate degree. Imagine that during these 1-2 years you enrol in your most preferred postgraduate degree. What do you think your life during these 1-2 years will be like? If you enrol in your preferred postgraduate degree, how likely do you think it is that you will...

- ...enjoy your social life?
- ...enjoy studying for your course?
- ...feel stressed?
- ...struggle financially?
- ...have parental support in your choice?
- ...work alongside your studies?

How high do you think the tuition fees for your course would be per year?

Now imagine that during the 1-2 years after you complete your undergraduate degree you do not enrol in a postgraduate degree but start working instead. What do you think your life during these 1-2 years will be like? If you start working, how likely do you think it is that you will...

- ...enjoy your social life?

- ...enjoy the work you will be doing?
- ...feel stressed?
- ...struggle financially?
- ...have parental support in your choice?

If you do not enrol in a postgraduate degree but start working instead, what do you think your pre-tax annual earnings would be during those 1-2 years? [in £]

Now we would like you to think about your life at age 35. Imagine that your highest qualification is a postgraduate degree in your preferred field of study. How likely do you think it is that you will...

- ...be working full-time?
- ...be satisfied with your professional career?
- ...have a high status in society?
- ...have a career in which you can contribute to society?
- ...have a good work-life balance?
- ...have children?

Assuming that you work full-time, what do you think your pre-tax annual earnings would be at age 35 if your highest qualification is a postgraduate degree in your preferred field of study? [in £]

Now we would like you to think about your life at age 35. Imagine that your highest qualification is an undergraduate degree in your current field of study. How likely do you think it is that you will...

- ...be working full-time?
- ...be satisfied with your professional career?
- ...have a high status in society?
- ...have a career in which you can contribute to society?
- ...have a good work-life balance?
- ...have children?

Assuming that you work full-time, what do you think your pre-tax annual earnings would be at age 35 if your highest qualification is an undergraduate degree in your current field of study? [in £]

APPENDIX C: SUPPLEMENTARY ANALYSES

Table C.1—: Distribution of Students Across Regions in England (%)

Region	Sample	National
East of England	6.89	6.69
East Midlands	10.08	9.90
London	17.96	17.86
North East	5.69	5.74
North West	13.47	13.53
South East	14.07	14.17
South West	9.88	10.01
West Midlands	10.78	10.86
Yorkshire and The Humber	11.18	11.24

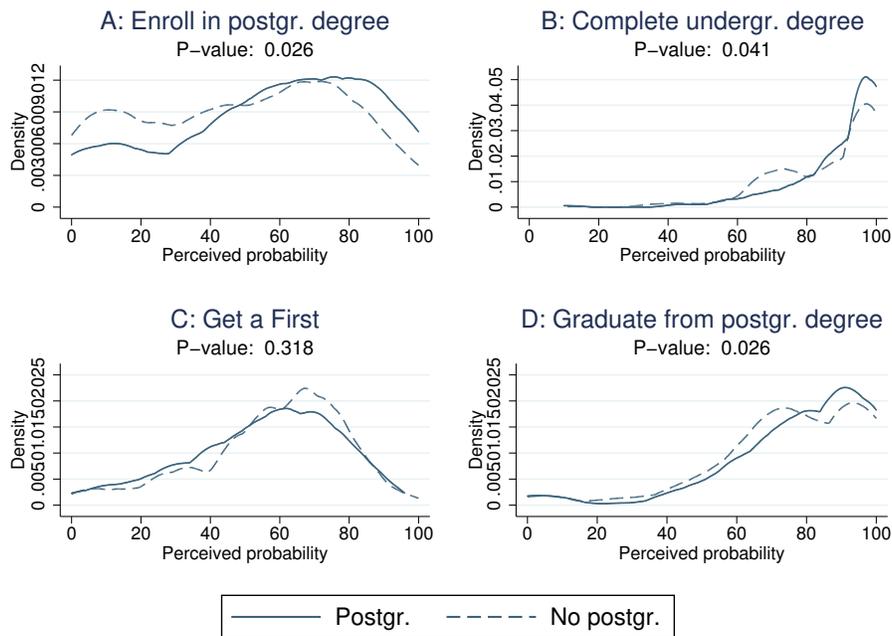
Notes: National figures come from the Higher Education Statistics Agency (HESA) and refer to the percentage of all students enrolled full-time in a first degree or other undergraduate degree in England. Data source: Higher Education Statistics Agency (2019a).

Table C.2—: Distribution of Students Across Subject Disciplines

Subject category	% All	% First	% Cont.	% Female	% Male	% Enroll postgr.
Medicine and Dentistry	5.21	4.01	6.41	5.45	4.97	33.92
Subjects allied to Medicine	6.71	7.41	6.01	10.71	2.78	49.42
Biological Sciences	13.23	13.03	13.43	17.37	9.15	57.77
Veterinary Science	0.90	0.80	1.00	1.41	0.40	19.00
Agriculture and Related Subjects	0.60	0.60	0.60	0.81	0.40	40.33
Physical Sciences	5.31	4.81	5.81	3.23	7.36	57.94
Mathematical Sciences	4.01	4.41	3.61	3.43	4.57	51.45
Computer Science	5.61	5.81	5.41	2.42	8.75	48.54
Engineering and Technology	8.22	8.02	8.42	2.42	13.92	50.29
Architecture	1.60	1.40	1.80	1.62	1.59	48.62
Social Studies	11.32	12.42	10.22	12.73	9.94	48.93
Law	4.71	6.21	3.21	5.05	4.37	51.72
Business and Administrative Studies	10.22	9.62	10.82	7.27	13.12	47.60
Mass Communications and Documentation	1.60	2.00	1.20	1.21	1.99	54.06
Languages	3.51	3.61	3.41	4.24	2.78	43.34
Historical and Philosophical Studies	4.91	4.21	5.61	4.85	4.97	49.00
Creative Arts and Design	8.92	8.02	9.82	11.11	6.76	46.11
Education	3.41	3.61	3.21	4.65	2.19	48.44

Notes: Subject categories refer to JACS 3.0 Principal subject codes. Column 1 reports the distribution of students in our sample across subjects. Columns 2 and 3 report the distribution for first- and continuing-generation students respectively. Columns 4 and 5 report the distribution separately for female and male respondents. P-value for a Pearson's test of equality of distribution across SES is 0.656. P-value for a Pearson's test of equality of distribution across gender is 0.000. Column 6 reports average state likelihood of continuing to postgraduate education, by subject field.

Figure C.1. : Differences in Beliefs by Parental Education - Continuing-Generation Students



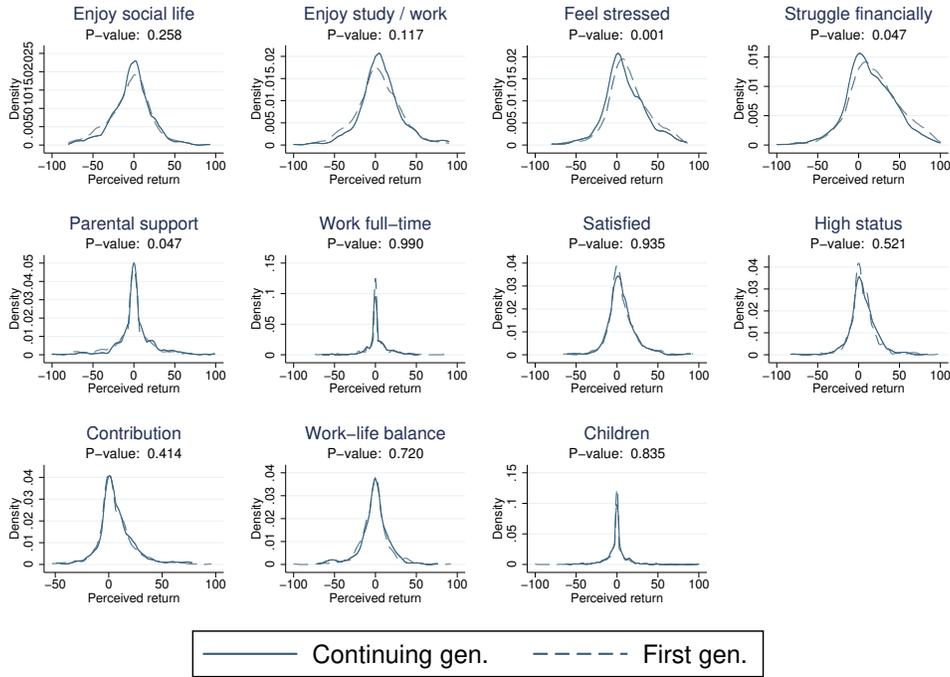
Notes: The different panels depict the kernel densities of individual beliefs about the likelihood of enrolling in a postgraduate degree (Panel A), graduating from their undergraduate degree (Panel B), getting a First in their undergraduate degree (Panel C), and graduating from their postgraduate degree (Panel D). The densities are depicted for students whose parents do not (dashed line) and do (solid line) hold a postgraduate qualification, respectively. The sample is restricted to continuing-generation students only. Reported p-values are from Kolmogorov-Smirnov tests of equality of distributions.

Table C.3—: Mean Beliefs for Immediate and Later-Life Outcomes by Parental Education - Continuing-generation Students

Belief	All			No postgr. qual.			Postgrad. qual.			Diff-in-diff
	Undergr	Postgr	Diff	Undergr	Postgr	Diff	Undergr	Postgr	Diff	
<i>Panel A: Immediate Outcomes</i>										
Enjoy social life	64.35 [20.43]	61.92 [20.30]	-2.43 0.020	64.17 [19.65]	61.35 [19.66]	-2.82 0.017	64.71 [22.00]	63.08 [21.55]	-1.63 0.438	-1.19 (2.22)
Enjoy study / work	63.92 [21.18]	70.20 [19.87]	6.28 0.000	63.96 [20.69]	69.19 [20.19]	5.24 0.000	63.84 [22.21]	72.27 [19.08]	8.43 0.000	-3.20 (2.48)
Feel stressed	62.74 [22.18]	72.49 [21.33]	9.74 0.000	62.75 [21.19]	72.32 [20.23]	9.57 0.000	62.74 [24.16]	72.84 [23.49]	10.10 0.000	-0.53 (2.41)
Struggle financially	44.09 [26.35]	58.69 [25.83]	14.60 0.000	46.04 [25.89]	59.73 [24.11]	13.69 0.000	40.12 [26.90]	56.55 [28.98]	16.43 0.000	-2.74 (2.79)
Parental support	79.51 [22.74]	81.48 [21.70]	1.97 0.048	80.36 [21.28]	78.72 [22.54]	-1.64 0.157	77.76 [25.43]	87.15 [18.69]	9.38 0.000	-11.03*** (2.06)
Immediate cost	0 -	37539.12 [13331.21]	37539.12 0.000	0 -	37461.65 [13171.38]	37461.65 0.000	0 -	37697.84 [13692.33]	37697.84 0.000	-236.18 (1271.11)
<i>Panel B: Later-Life Outcomes</i>										
Earnings	43399.88 [17185.27]	50618.12 [17629.89]	7218.25 0.000	43428.60 [18194.99]	50029.06 [18023.24]	6600.46 0.000	43341.02 [14957.24]	51824.98 [16784.40]	8483.95 0.000	-1883.49* (1061.28)
Work full-time	82.99 [17.50]	85.10 [16.88]	2.10 0.000	81.83 [17.96]	83.27 [17.97]	1.44 0.027	85.38 [16.31]	88.85 [13.70]	3.47 0.002	-2.03* (1.20)
Satisfied with career	68.87 [18.40]	74.09 [16.61]	5.22 0.000	68.87 [17.76]	73.28 [16.94]	4.40 0.000	68.87 [19.70]	75.77 [15.83]	6.90 0.000	-2.50 (1.58)
High status	55.96 [23.69]	61.26 [23.23]	5.30 0.000	57.17 [23.03]	61.14 [23.26]	3.97 0.000	53.46 [24.86]	61.50 [23.25]	8.04 0.000	-4.07*** (1.56)
Contribution	65.49 [21.98]	72.80 [20.61]	7.31 0.000	66.07 [21.36]	72.66 [20.73]	6.60 0.000	64.30 [23.23]	73.07 [20.42]	8.77 0.000	-2.17 (1.64)
Work-life balance	64.88 [19.66]	63.70 [20.77]	-1.17 0.144	65.03 [18.90]	63.59 [20.38]	-1.45 0.127	64.55 [21.20]	63.94 [21.61]	-0.62 0.681	-0.83 (1.71)
Children	62.00 [30.26]	61.10 [29.62]	-0.90 0.134	62.93 [28.52]	61.96 [28.37]	-0.97 0.202	60.09 [33.57]	59.34 [32.04]	-0.75 0.433	-0.22 (1.28)

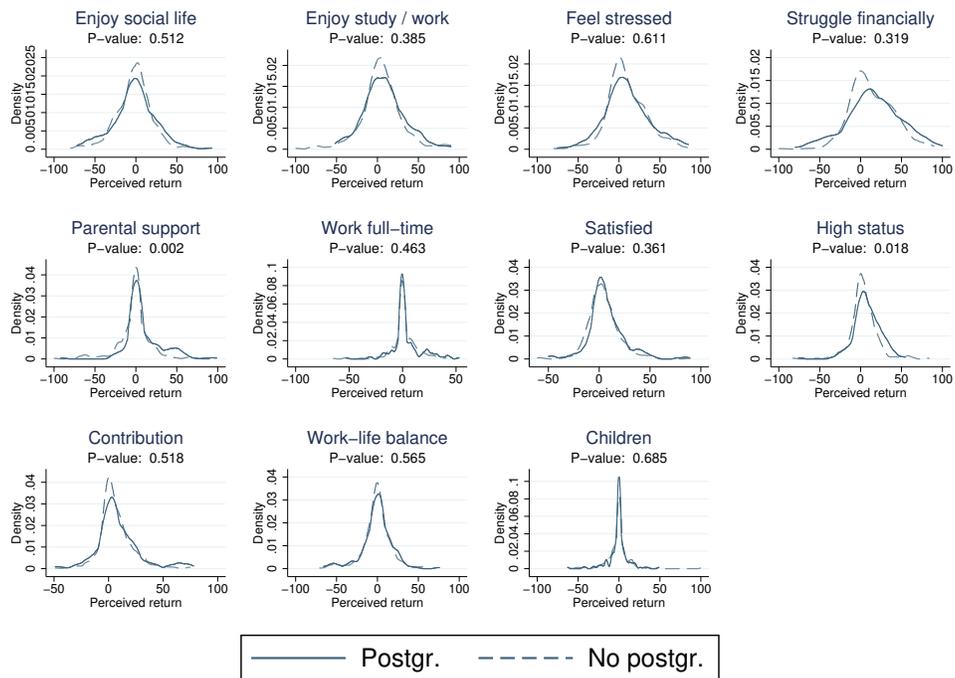
Notes: Standard deviations given in square brackets, standard errors given in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The sample is restricted to continuing-generation students. This table provides mean beliefs for the whole subsample and by the education level of the respondent's parents. Columns 1-3 provide results for the whole sample. Columns 4-6 are for respondents for whom neither parent holds a postgraduate degree, while Columns 7-9 are for respondents for whom at least one parent holds a postgraduate qualification. Within each group, the first two columns give mean beliefs for the respective characteristic under the scenarios of having an undergraduate or postgraduate degree as highest qualification respectively. Mean beliefs are given on a 0-100 scale other than for expected earnings and immediate costs, which are in pounds. The third column gives the mean difference between these two beliefs, with the p-value for a t-test of difference in means reported underneath. Column 10 (Diff-in-diff) gives the average difference for respondents for whom neither parent has a postgraduate degree minus the average difference for respondents for whom at least one parent has a postgraduate degree.

Figure C.2. : Distribution of Perceived Returns to Postgraduate Education by Parental Education



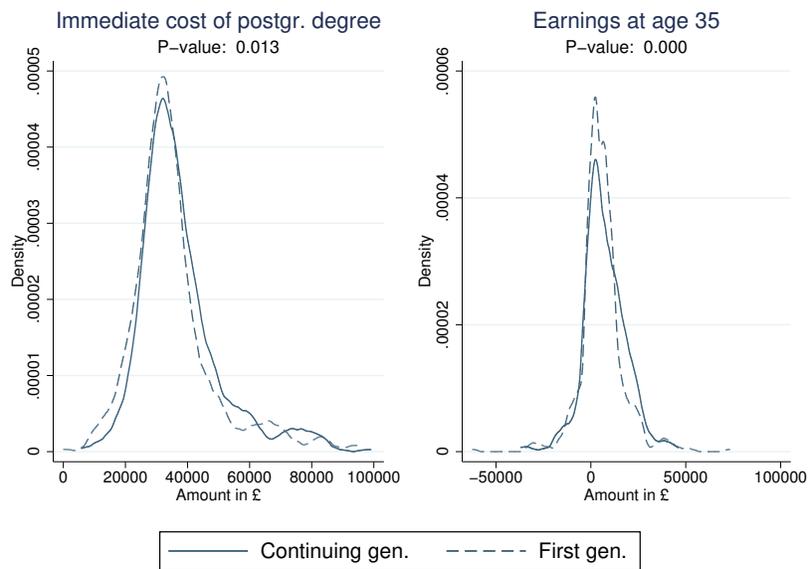
Notes: The different panels depict the kernel densities of individual beliefs about returns to postgraduate education in terms of the different binary outcomes 1-2 years after graduation and at age 35. The densities are depicted for first-generation students (dashed line) and continuing-generation students (solid line). Reported p-values are from Kolmogorov-Smirnov tests of equality of distributions.

Figure C.3. : Distribution of Perceived Returns to Postgraduate Education by Parental Education - Continuing-generation Students



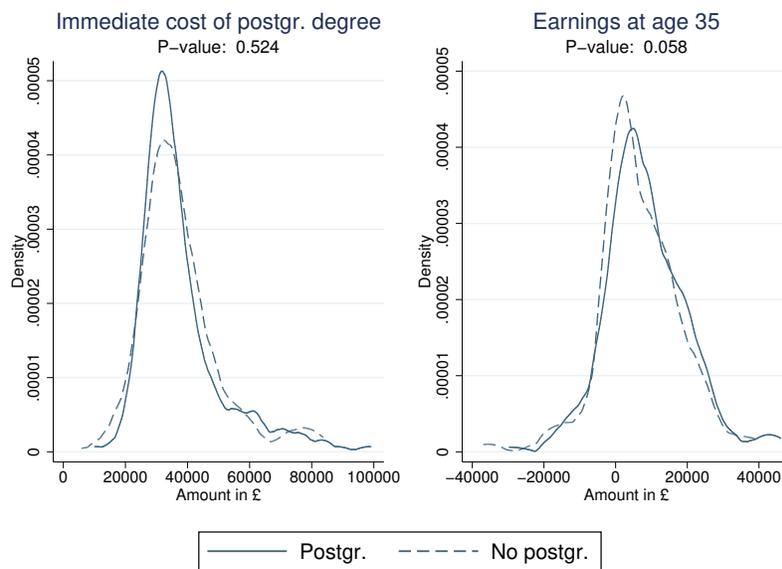
Notes: The different panels depict the kernel densities of individual beliefs about returns to postgraduate education in terms of the different binary outcomes 1-2 years after graduation and at age 35. The densities are depicted for students whose parents do not (dashed line) and do (solid line) hold a postgraduate qualification, respectively. The sample is restricted to continuing-generation. Reported p-values are from Kolmogorov-Smirnov tests of equality of distributions.

Figure C.4. : Distribution of Immediate Costs and Expected Earnings by Parental Education



Notes: The two panels depict the kernel densities of individual beliefs about expected immediate costs of postgraduate education, calculated as the sum of expected tuition fees and foregone earnings in the 1-2 years after finishing the undergraduate degree, and expected earnings at age 35 conditional on working full-time. The densities are depicted separately for first-generation students (dashed line) and continuing-generation students (solid line). Reported p-values are from Kolmogorov-Smirnov tests of equality of distributions.

Figure C.5. : Distribution of Immediate Costs Expected Earnings by Parental Education - Continuing-Generation Students



Notes: The two panels depict the kernel densities of individual beliefs about expected immediate costs of postgraduate education, calculated as the sum of expected tuition fees and foregone earnings in the 1-2 years after finishing the undergraduate degree, and expected earnings at age 35 conditional on working full-time. The densities are depicted for continuing-generation students separated by whether their parents do (solid line) or do not (dashed line) hold a postgraduate qualification. Reported p-values are from Kolmogorov-Smirnov tests of equality of distributions.

Table C.4—: Differences in Experiences by Parental Education

Experience	All	Parental background		P-value
		First	Continuing	
Enjoy social life	67.92 (24.25)	65.00 (25.53)	70.83 (22.54)	0.000
Meet people	68.56 (21.77)	67.39 (22.97)	69.74 (20.46)	0.088
Little contact	38.84 (29.09)	37.51 (29.41)	40.17 (28.74)	0.148
Feel lonely	47.20 (30.79)	45.33 (31.82)	49.07 (29.64)	0.054
Enjoy studying	68.25 (22.15)	67.05 (23.15)	69.44 (21.06)	0.087
Material interesting	70.11 (21.14)	68.65 (21.76)	71.56 (20.42)	0.029
Material too hard	47.97 (25.49)	47.64 (26.00)	48.30 (24.99)	0.682
Feel stressed	52.00 (28.41)	52.48 (29.21)	51.52 (27.60)	0.596
Struggle financially	43.79 (30.79)	45.28 (30.93)	42.30 (30.61)	0.126
Have enough money	53.04 (27.37)	48.62 (27.27)	57.45 (26.77)	0.000
Parental support	86.96 (20.47)	83.98 (23.45)	89.95 (16.45)	0.000
Life better than expected	59.93 (25.83)	57.75 (26.82)	62.11 (24.63)	0.008

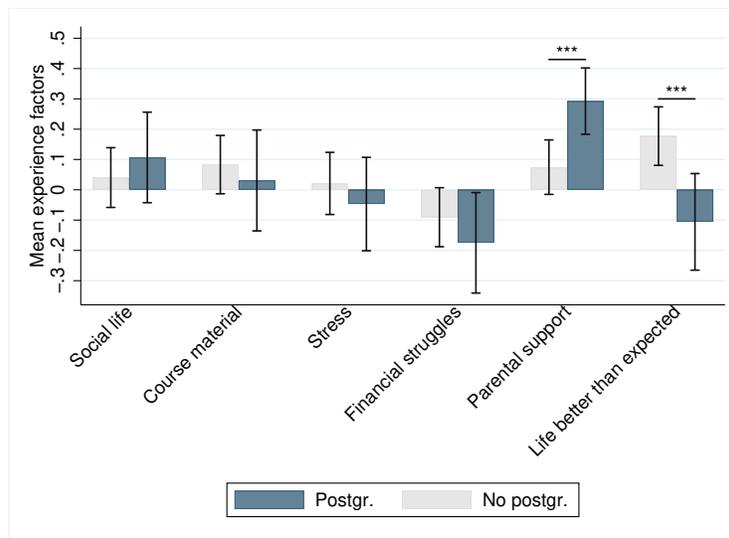
Notes: Standard deviations given in parentheses. This table separately provides mean university experiences on a 0-100 scale for the whole sample (Column 1) and by whether at least one parent has a degree (Columns 2 and 3). Column 2 refers to first-generation students, whilst Column 3 refers to continuing-generation students. P-values for a test of difference in means are provided in Column 4.

Table C.5—: Differences in Experiences by Parental Education - Continuing-generation Students

Experience	All	Parental background		P-value
		No postgr.	Postgr.	
Enjoy social life	70.83 (22.54)	70.72 (22.52)	71.07 (22.66)	0.869
Meet people	69.74 (20.46)	69.49 (20.04)	70.25 (21.36)	0.698
Little contact	40.17 (28.74)	41.34 (28.18)	37.76 (29.81)	0.191
Feel lonely	49.07 (29.64)	50.29 (28.95)	46.59 (30.95)	0.191
Enjoy studying	69.44 (21.06)	69.66 (19.99)	68.99 (23.17)	0.740
Material interesting	71.56 (20.42)	72.03 (19.15)	70.60 (22.82)	0.464
Material too hard	48.30 (24.99)	49.35 (24.79)	46.14 (25.33)	0.179
Feel stressed	51.52 (27.60)	51.50 (27.16)	51.58 (28.59)	0.976
Struggle financially	42.30 (30.61)	44.86 (29.89)	37.02 (31.49)	0.007
Have enough money	57.45 (26.77)	58.36 (25.51)	55.57 (29.20)	0.275
Parental support	89.95 (16.45)	88.49 (17.14)	92.95 (14.51)	0.004
Life better than expected	62.11 (24.63)	64.51 (23.23)	57.20 (26.70)	0.002

Notes: Standard deviations given in parentheses. This table separately provides mean university experiences on a 0-100 scale for the subsample of continuing-generation students (Column 1) and by whether at least one parent has a postgraduate degree (Columns 2 and 3). Column 2 refers to students whose parents only have an undergraduate degree, whilst Column 3 refers to students for whom at least one parent has a postgraduate degree. P-values for a test of difference in means are provided in Column 4.

Figure C.6. : Experience of Life at University by Parental Education - Continuing-generation Students



Notes: The figure shows the average value for the first factor from a factor analysis of the variables related to the social life, positive and negative aspects of the course work and financial situation, as well as the standardized variables for having parental support and perceiving life at university as better than expected. The sample is restricted to continuing-generation students only, and students are divided according to whether their parents do (blue bars) or do not (gray bars) hold a postgraduate qualification. The black caps represent 95% confidence intervals and stars indicate statistical significance of differences by parental background: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table C.6—: Differences in Time Allocation by Parental Education

Time Allocation	All	Parental background		P-value
		First	Continuing	
Time lectures	12.02 (8.31)	12.68 (8.40)	11.38 (8.17)	0.015
Time studying	12.83 (10.67)	12.28 (10.55)	13.38 (10.78)	0.108
Time student societies	2.20 (3.75)	1.62 (3.10)	2.77 (4.21)	0.000
Time socialising with friends	11.11 (14.04)	11.23 (13.81)	10.98 (14.27)	0.780
Time work for pay	3.78 (7.27)	4.44 (8.03)	3.13 (6.38)	0.005
Time work not for pay	0.63 (3.13)	0.47 (2.42)	0.78 (3.68)	0.119
% Work for pay	0.34 (0.47)	0.33 (0.47)	0.35 (0.48)	0.355
% Work not for pay	0.09 (0.28)	0.06 (0.24)	0.11 (0.31)	0.007
Total time work	11.64 (9.17)	13.56 (8.61)	9.91 (9.34)	0.000
Work related to study	37.01 (34.59)	31.50 (35.21)	42.11 (33.28)	0.003
Work will help in future career	51.84 (32.08)	46.25 (32.95)	57.02 (30.43)	0.001
Summer: Number of weeks engaged in work	4.29 (5.03)	4.58 (5.34)	3.99 (4.68)	0.066
Summer work: related to studies	36.20 (35.74)	31.73 (36.44)	40.03 (34.74)	0.006
Summer work: parents knew employer	0.28 (0.45)	0.23 (0.42)	0.33 (0.47)	0.007
Summer work: parents helped with application	0.15 (0.36)	0.10 (0.30)	0.19 (0.39)	0.004

Notes: Standard deviations given in parentheses. This table separately provides mean values for the time allocation variables for the whole sample (Column 1) and by whether at least one parent has a degree (Columns 2 and 3). Column 2 refers to first-generation students, whilst Column 3 refers to continuing-generation students. P-values for a test of difference in means are provided in Column 4.

Table C.7—: Differences in Time Allocation by Parental Education - Continuing-generation Students

Time Allocation	Cont. gen.	Parental background		P-value
		No postgr.	Postgr.	
Time lectures	11.38 (8.17)	11.00 (8.49)	12.16 (7.44)	0.141
Time studying	13.38 (10.78)	13.87 (11.20)	12.37 (9.81)	0.153
Time student societies	2.77 (4.21)	2.77 (4.02)	2.76 (4.61)	0.976
Time socialising with friends	10.98 (14.27)	10.06 (13.71)	12.88 (15.24)	0.041
Time work for pay	3.13 (6.38)	2.93 (5.96)	3.53 (7.16)	0.335
Time work not for pay	0.78 (3.68)	0.72 (3.64)	0.90 (3.77)	0.624
% Work for pay	0.35 (0.48)	0.37 (0.48)	0.32 (0.47)	0.277
% Work not for pay	0.11 (0.31)	0.11 (0.31)	0.11 (0.32)	0.874
Total time work	9.91 (9.34)	9.19 (8.62)	11.36 (10.59)	0.138
Work related to study	42.11 (33.28)	45.54 (31.33)	35.14 (36.21)	0.042
Work will help in future career	57.02 (30.43)	59.02 (28.70)	52.97 (33.56)	0.197
Summer: Number of weeks engaged in work	3.99 (4.68)	3.96 (4.57)	4.07 (4.92)	0.808
Summer work: related to studies	40.03 (34.74)	41.61 (34.71)	36.64 (34.75)	0.247
Summer work: parents knew employer	0.33 (0.47)	0.35 (0.48)	0.28 (0.45)	0.241
Summer work: parents helped with application	0.19 (0.39)	0.22 (0.42)	0.12 (0.33)	0.050

Notes: Standard deviations given in parentheses. This table separately provides mean values for the time allocation variables for the sample of continuing-generation students (Column 1) and by whether at least one parent has a post-graduate degree (Columns 2 and 3). Column 2 refers to students whose parents do not have a postgraduate qualification, whilst Column 3 refers to students for whom at least one parent has a postgraduate degree. P-values for a test of difference in means are provided in Column 4.

Table C.8—: Differences in Student Finances by Parental Education

Finances	All	Parental background		P-value
		First	Continuing	
Loan for tuition fees	0.88 (0.32)	0.95 (0.22)	0.82 (0.39)	0.000
Money from parents / family	0.77 (0.42)	0.50 (0.51)	0.85 (0.36)	0.000
Money from work	0.30 (0.46)	0.19 (0.40)	0.33 (0.47)	0.180
Savings	0.17 (0.38)	0.15 (0.37)	0.18 (0.38)	0.795
Other sources	0.18 (0.39)	0.31 (0.47)	0.14 (0.35)	0.054
Living expenses (£)	600.10 (382.22)	552.20 (372.58)	647.90 (386.08)	0.000
Amount from loans	501.54 (1035.22)	504.85 (759.12)	498.30 (1248.58)	0.922
Amount from grants	43.80 (134.56)	52.24 (137.65)	35.46 (131.04)	0.054
Amount from parents	212.74 (322.86)	110.62 (209.13)	313.38 (378.98)	0.000
Amount from work	87.26 (172.57)	96.34 (173.66)	78.36 (171.20)	0.108
Amount from savings	47.77 (132.33)	44.16 (117.80)	51.28 (145.15)	0.409
Amount from other sources	4.01 (24.90)	3.74 (22.74)	4.29 (26.89)	0.736

Notes: Standard deviations given in parentheses. This table separately provides mean values for student finances for the whole sample (Column 1) and by whether at least one parent has a degree (Columns 2 and 3). Column 2 refers to first-generation students, whilst Column 3 refers to continuing-generation students. P-values for a test of difference in means are provided in Column 4.

Table C.9—: Differences in Student Finances by Parental Education - Continuing-generation Students

Finances	Cont. gen.	Parental background		P-value
		No Postgr.	Postgr.	
Loan for tuition fees	0.82 (0.39)	0.82 (0.38)	0.80 (0.40)	0.586
Money from parents / family	0.85 (0.36)	0.90 (0.30)	0.75 (0.44)	0.062
Money from work	0.33 (0.47)	0.44 (0.50)	0.12 (0.34)	0.002
Savings	0.18 (0.38)	0.19 (0.39)	0.16 (0.37)	0.722
Other sources	0.14 (0.35)	0.12 (0.33)	0.19 (0.40)	0.376
Living expenses (£)	647.90 (386.08)	646.29 (387.44)	651.22 (384.43)	0.893
Amount from loans	498.30 (1248.58)	537.15 (1314.57)	418.38 (1100.14)	0.329
Amount from grants	35.46 (131.04)	37.43 (133.30)	31.42 (126.61)	0.638
Amount from parents	313.38 (378.98)	310.17 (390.78)	319.87 (355.00)	0.793
Amount from work	78.36 (171.20)	86.72 (185.80)	60.77 (134.31)	0.120
Amount from savings	51.28 (145.15)	50.63 (147.30)	52.60 (141.09)	0.889
Amount from other sources	4.29 (26.89)	4.06 (26.38)	4.76 (27.99)	0.789

Notes: Standard deviations given in parentheses. This table separately provides mean values for student finances for the sample of continuing-generation students (Column 1) and by whether at least one parent has a post-graduate degree (Columns 2 and 3). Column 2 refers to students whose parents do not have a postgraduate qualification, whilst Column 3 refers to students for whom at least one parent has a postgraduate degree. P-values for a test of difference in means are provided in Column 4.

Table C.10—: Removing Outliers

	All		First generation		Continuing generation		Difference (p-value)	
	Coef.	WTP	Coef.	WTP	Coef.	WTP	Coef.	WTP
Expected earnings at age 35 ($10000\gamma_1$)	0.16*** (0.041)	-	0.08 (0.060)	-	0.20*** (0.057)	-	0.116	
Enjoy social life (Δu_1)	0.61*** (0.203)	379.17** (163.542)	0.81*** (0.253)	1079.26 (934.351)	0.52* (0.317)	255.75 (175.374)	0.478	0.386
Enjoy study / work (Δu_2)	0.98*** (0.210)	606.02*** (187.605)	0.59** (0.263)	786.43 (688.001)	1.42*** (0.314)	692.36*** (229.780)	0.044	0.897
Feel stressed (Δu_3)	-0.09 (0.180)	-56.94 (113.604)	0.01 (0.239)	11.22 (318.944)	-0.18 (0.278)	-86.86 (138.838)	0.611	0.778
Struggle financially (Δu_4)	-0.34** (0.155)	-211.16* (113.109)	-0.35 (0.215)	-468.49 (445.952)	-0.30 (0.222)	-147.04 (121.354)	0.869	0.486
Parental support (Δu_5)	1.13*** (0.199)	704.14*** (223.627)	1.24*** (0.271)	1648.65 (1396.944)	1.02*** (0.304)	496.73** (203.279)	0.586	0.414
Immediate cost ($10000\gamma_2$)	0.11*** (0.031)	0.69*** (0.253)	0.11*** (0.044)	1.53 (1.255)	0.11** (0.047)	0.55** (0.274)	0.984	0.449
Work full time at age 35 (Δu_6)	-0.04 (0.374)	-26.40 (231.877)	-0.67 (0.525)	-894.72 (1001.796)	0.64 (0.503)	311.04 (268.452)	0.072	0.245
Satisfied with career at age 35 (Δu_7)	0.58* (0.314)	357.86 (223.096)	0.63 (0.449)	841.70 (926.129)	0.72 (0.438)	351.23 (243.098)	0.890	0.608
High status at age 35 (Δu_8)	0.50 (0.346)	307.46 (243.787)	0.33 (0.520)	437.72 (821.978)	0.56 (0.460)	272.50 (255.055)	0.741	0.848
Contribute to society at age 35 (Δu_9)	0.63* (0.332)	390.22 (238.906)	1.05** (0.445)	1404.13 (1278.456)	0.13 (0.478)	61.08 (236.466)	0.154	0.301
Work-life balance at age 35 (Δu_{10})	0.44 (0.319)	274.44 (213.670)	0.75* (0.428)	993.79 (1058.126)	0.17 (0.442)	81.51 (215.493)	0.346	0.398
Have children at age 35 (Δu_{11})	0.46 (0.389)	288.71 (252.273)	0.59 (0.512)	791.48 (954.178)	0.36 (0.563)	177.48 (278.775)	0.761	0.537
Graduate postgr.	1.36*** (0.178)	846.61*** (246.323)	1.68*** (0.215)	2241.03 (1819.707)	0.87*** (0.289)	424.64** (185.636)	0.024	0.320
Observations	826	826	403	403	423	423		
Variance explained	0.232		0.347		0.261			

Notes: Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Column 1 presents the estimates of the choice model for the whole sample, while column 2 presents the willingness-to-pay calculations. Columns 3-4 present the results for first-generation students, columns 5-6 present the results for continuing-generation students. For the willingness to pay calculations, standard errors are calculated using the delta method. Continuing-generation students are defined as those students who have at least one parent with university education.

Table C.11—: Removing Respondents from Non-English Institutions

	All		First generation		Continuing generation		Difference (p-value)	
	Coef.	WTP	Coef.	WTP	Coef.	WTP	Coef.	WTP
Expected earnings at age 35 ($10000\gamma_{-1}$)	0.13*** (0.038)	-	0.08 (0.051)	-	0.17*** (0.056)	-	0.258	
Enjoy social life (Δu_1)	0.38** (0.188)	295.72* (176.478)	0.64*** (0.224)	802.02 (598.141)	0.16 (0.303)	93.37 (188.337)	0.195	0.258
Enjoy study / work (Δu_2)	1.14*** (0.177)	882.28*** (283.343)	0.90*** (0.231)	1119.34 (742.371)	1.55*** (0.272)	928.87*** (350.103)	0.070	0.816
Feel stressed (Δu_3)	-0.17 (0.155)	-129.51 (123.244)	-0.32 (0.203)	-395.70 (333.795)	-0.05 (0.246)	-30.93 (147.705)	0.404	0.317
Struggle financially (Δu_4)	-0.31** (0.141)	-243.25* (130.958)	-0.14 (0.193)	-174.76 (257.747)	-0.42** (0.210)	-250.73 (156.909)	0.332	0.801
Parental support (Δu_5)	0.99*** (0.177)	771.63*** (261.625)	0.95*** (0.231)	1180.23 (823.084)	1.00*** (0.286)	601.13** (255.095)	0.886	0.501
Immediate cost ($10000\gamma_2$)	0.08*** (0.027)	0.61** (0.293)	0.09*** (0.033)	1.07 (0.804)	0.08* (0.044)	0.45 (0.333)	0.853	0.479
Work full time at age 35 (Δu_6)	-0.33 (0.291)	-257.25 (236.709)	-1.00*** (0.361)	-1249.98 (958.127)	0.44 (0.456)	262.70 (299.958)	0.013	0.132
Satisfied with career at age 35 (Δu_7)	0.84*** (0.279)	654.36** (313.034)	0.90** (0.398)	1117.63 (942.371)	0.94** (0.383)	566.33* (316.373)	0.935	0.579
High status at age 35 (Δu_8)	0.55** (0.256)	423.20 (260.728)	0.55 (0.358)	681.59 (693.111)	0.51 (0.377)	308.42 (275.200)	0.948	0.617
Contribute to society at age 35 (Δu_9)	0.33 (0.266)	257.41 (221.059)	0.82** (0.372)	1025.66 (822.506)	-0.16 (0.366)	-96.23 (221.507)	0.059	0.188
Work-life balance at age 35 (Δu_{10})	0.14 (0.241)	109.18 (191.855)	-0.10 (0.317)	-122.80 (393.059)	0.36 (0.347)	218.12 (222.196)	0.326	0.450
Have children at age 35 (Δu_{11})	0.58* (0.304)	452.08 (283.958)	0.25 (0.437)	306.04 (598.740)	0.78* (0.420)	469.64 (309.172)	0.377	0.808
Graduate postgr.	1.57*** (0.170)	1214.79*** (375.215)	1.86*** (0.209)	2316.45 (1486.088)	1.05*** (0.280)	631.78** (270.069)	0.021	0.264
Observations	939	939	473	473	466	466		
Variance explained	0.333		0.384		0.311			

Notes: Standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01. Column 1 presents the estimates of the choice model for the whole sample, while column 2 presents the willingness-to-pay calculations. Columns 3-4 present the results for first-generation students, columns 5-6 present the results for continuing-generation students. For the willingness to pay calculations, standard errors are calculated using the delta method. Continuing-generation students are defined as those students who have at least one parent with university education. The sample only includes students for whom we have information on the university currently attendend, and the institution is in England.

Table C.12—: Removing Respondents For Whom the Probability of Completing Undergraduate Degree is Below 50%

	All		First generation		Continuing generation		Difference (p-value)	
	Coef.	WTP	Coef.	WTP	Coef.	WTP	Coef.	WTP
Expected earnings at age 35 ($10000\gamma_1$)	0.11*** (0.036)	-	0.07 (0.050)	-	0.16*** (0.054)	-	0.249	
Enjoy social life (Δu_1)	0.36** (0.185)	316.92 (196.984)	0.62*** (0.222)	844.04 (665.134)	0.13 (0.296)	84.39 (192.626)	0.190	0.272
Enjoy study / work (Δu_2)	1.16*** (0.174)	1012.15*** (347.376)	0.93*** (0.228)	1274.64 (902.272)	1.52*** (0.262)	962.59*** (362.086)	0.091	0.748
Feel stressed (Δu_3)	-0.16 (0.150)	-137.77 (135.136)	-0.24 (0.203)	-326.23 (326.463)	-0.12 (0.233)	-75.41 (150.080)	0.698	0.485
Struggle financially (Δu_4)	-0.37*** (0.134)	-322.43** (157.926)	-0.28 (0.183)	-376.95 (351.985)	-0.41** (0.196)	-256.44 (158.574)	0.631	0.755
Parental support (Δu_5)	1.04*** (0.178)	907.05*** (323.884)	0.98*** (0.231)	1333.00 (977.903)	1.12*** (0.290)	709.51** (291.791)	0.697	0.541
Immediate cost ($10000\gamma_2$)	0.09*** (0.026)	0.78** (0.347)	0.10*** (0.033)	1.33 (0.980)	0.09** (0.042)	0.54 (0.349)	0.820	0.447
Work full time at age 35 (Δu_6)	-0.23 (0.287)	-201.94 (256.125)	-0.90** (0.374)	-1227.26 (993.041)	0.45 (0.416)	286.57 (291.713)	0.016	0.143
Satisfied with career at age 35 (Δu_7)	0.80*** (0.271)	701.98** (349.797)	0.78** (0.389)	1069.89 (971.934)	0.97*** (0.369)	612.68* (331.654)	0.731	0.656
High status at age 35 (Δu_8)	0.58** (0.251)	502.65* (303.126)	0.59* (0.355)	803.26 (809.998)	0.51 (0.366)	324.00 (284.346)	0.881	0.576
Contribute to society at age 35 (Δu_9)	0.38 (0.262)	328.66 (253.680)	0.93** (0.373)	1264.72 (1007.274)	-0.17 (0.357)	-109.35 (226.659)	0.033	0.183
Work-life balance at age 35 (Δu_{10})	0.11 (0.235)	92.75 (207.970)	-0.16 (0.307)	-221.28 (430.891)	0.36 (0.339)	229.11 (224.090)	0.251	0.354
Have children at age 35 (Δu_{11})	0.61** (0.302)	532.93 (328.288)	0.29 (0.438)	401.01 (685.177)	0.83** (0.415)	528.36 (329.230)	0.370	0.867
Graduate postgr.	1.52*** (0.168)	1327.45*** (442.428)	1.85*** (0.207)	2527.34 (1734.568)	0.94*** (0.278)	592.23** (264.185)	0.008	0.270
Observations	971	971	489	489	482	482		
Variance explained	0.332		0.386		0.307			

Notes: Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The sample is restricted to respondents for whom the self-reported probability of completing their undergraduate degree is 50% or above. Column 1 presents the estimates of the choice model for the whole sample, while column 2 presents the willingness-to-pay calculations. Columns 3-4 present the results for first-generation students, columns 5-6 present the results for continuing-generation students. For the willingness to pay calculations, standard errors are calculated using the delta method. Continuing-generation students are defined as those students who have at least one parent with university education.