Parental Background, Labour Market Expectations and University Applications Intentions in the UK

Adeline Delavande[1]

Joshua Fullard[2]

Basit Zafar[3]

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Abstract

Using new data on university-related subjective expectations elicited from parents and young people in the Innovation Panel of the UK Household Longitudinal Study, we investigate whether differences in knowledge about the returns to a degree can partially explain the gap in university participation by socio-economic status (SES). Those perceived returns are thought to be important in the decision to go to university and, indeed, our data show that parents/young people who expect higher labour market returns from a degree also expect a higher probability that their child/they will apply to university. Parents and young people from various SES backgrounds hold similar beliefs about the earnings return and employment returns to a degree. It is therefore unlikely that the information gap about the labour market advantage of a degree explains the SES gap in participation. We also find that a very light-touch information intervention showing some statistics about population earnings and employment to families is powerful enough to change parents' expectations about population earnings so that they become more accurate, with changes still visible 6 months later. This information also increases participants' perceptions about the returns to a degree in the population. However, it does not change parents' perceptions about the future labour market outcomes of their own children. Possibly due to private information, those may be less responsive to general information.

[1] Delavande: University of Essex (email: aldela@essex.ac.uk)
[2] Fullard: University of Essex (email: jjfull@essex.ac.uk)
[3] Zafar: Arizona State University(email: Basit.Zafar@asu.edu)

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1. Introduction

There has been a dramatic increase in participation in higher education in the UK. In England, for example, the proportion of 17 to 30 years olds participating in higher education increased from just 5% in 1960 to 49% in 2012, with a strong acceleration in the 1990s (Department for Business Innovation and Skills 2013). A number of studies demonstrate that the expansion of the higher education sector has reinforced rather than attenuated socio-economic inequalities in higher education (Lindlay and Machin 2012, Machin and Vignoles 2004). Previous research for the UK suggests that university enrolment (conditional on application) is not related to income once previous achievements are accounted for (Ermisch and Del Bono 2012), but application decisions are (Anders 2012).

There are several (potentially non-exclusive) reasons for the socio-economic (SES) gradient in university applications. Traditional models have emphasised the role of difficulty in accessing credit to explain the gap in enrolment (e.g., Lochner and Monje-Naranjo 2012). However, it is not clear why those gaps are seen in countries where grants and loans are available to students from disadvantaged backgrounds. Other factors may correlate with family income: Many studies show high-SES families promote cognitive and non-cognitive skills, have better access to information (which could influence beliefs about available financial aid, the requirements for university admission and the returns to education), and have an increased taste for education or a greater ability to pass on academic ability (Carneiro and Heckman 2002, Dearden et al. 2004). Without data on expectations, it is challenging to separate these various explanations (e.g., Manski, 2004). Yet, the policy implications of these various reasons are distinct. Financial constraints can be alleviated with reduced tuition fees, increased financial aid or easier access to credit. The effect of poor parenting skills and poor home learning environments can be mitigated through high-quality pre-school programmes aimed at boosting cognitive and non-cognitive skills for all children. Unequal access to information can be reduced by targeted information campaigns, as well as mentoring and coaching programmes tailored to disadvantaged students.

In this paper, we use new data elicited from parents and young people in the Innovation Panel of the UK Household Longitudinal Study on: (i) university-related expectations about the chances of qualifying, applying and completing a university degree; (ii) subjective expectations about labour market outcomes conditional on having a university degree or not, (iii) beliefs about population earnings; to (a) provide descriptive evidence on labour market

expectations and higher education intentions in the UK and how it varies by family background, (b) assess the accuracy of beliefs, (c) evaluate the relationship between parents and children expectation and, (d) investigate the role of future labour market expectations in the decision to apply to university. Finally, using a randomized information treatment, this paper investigates whether the provision of information on labour market outcomes impacts parents, and young peoples, labour market, and university-related expectations and outcomes.

The differences in expected university outcomes by parental education are clear and large: while 78 per cent of parents belonging to university degree households (i.e. where at least one parent has a university degree) believe their child will have a degree by age 30, only 54 per cent of their counterparts believe so (difference statistically significant at the one per cent level). This difference in expected outcome stems from differences in all the steps of the way toward acquiring a degree: parents from university degree households have higher expectations of the chance of qualifying to go to university (83 vs 65 per cent), the chance of applying if they qualify (83 vs 68 per cent) and the chance of finishing university conditional on going (91 vs 87 per cent). Differences in application expectations persist by household degree status even when financial costs are (hypothetically) forgone. This suggests that there are differences other than financial constraints that explain the gap in expected university outcomes by household degree. While there are also differences in expectations by household income, they are substantially smaller than by household degree. Young people's university-related expectations tend to mirror those of their parents, although children from households with a university degree have slightly lower expectations than their parents, resulting in a smaller gap in expectations by household education.

Respondents perceive overall a positive payoff for their children/themselves to a university degree versus no university degree, both in terms of employment and earnings. For example, Parents expect their children to earn £33,500 per annum on average if they have a university degree, compared to £24,300 per annum without a degree. Interestingly, parents from a high-income household or from a university degree household expect their children to earn significantly more both *with* a degree and *without* a degree than their counterparts. They also expect their children to have a more favourable growth in earnings. As a result, parents from more privileged backgrounds do not expect higher earning returns to a university degree than parents from less privileged background.

These differences in earnings expectations by background could be due to different beliefs about children's ability, or different access to job networks. Interestingly, they do not seem to be driven primarily by differential knowledge of population earnings. To directly test respondents' knowledge, we asked them about the average earnings of current 30 year-olds who have a degree and those of 30 years old who do not have a degree of the same gender as their child. For the population earnings with a degree, parents from all backgrounds tend to have similar, and underestimated, perceptions. Parents from more privileged backgrounds expect slightly larger population earnings without a degree than their counterparts, and are as a result slightly more accurate, as everyone tends to under-estimate those earnings as well. But the difference by parental background in population earnings expectations is small, and more than half the one found for their children's future earnings. Overall, parents under-estimate the population earnings returns to a degree by about £2,000 per annum.

Our focus on the perceived labour market returns to a degree stem from the fact that they ought to be an important driver of the decision to go to university. Indeed, in our data, parents who expect higher labour market returns for their children also expect a higher probability that their child will apply to university. A unique feature of our data is that we have both parents and their own children's subjective expectations. Interestingly, we find that young people's intentions to apply to university are related to their *own* perception of labour market returns to a degree, but not their parents' (once their own is controlled for). However, given that parents and young people from various SES backgrounds hold similar beliefs about the earnings return and employment returns to a degree suggest that it is unlikely that information gaps about the labour market advantage of a degree explains the SES gap in participation.

Half of the households were randomly provided with information about the average annual earnings of men and women aged 26-34 and working full time for university degree holders and for those without a university degree, and their respective employment rate. Households received a mailing with an information sheet just after the baseline interview, and by post again about 6 months prior to the follow-up interview. Those who received the information are more accurate about the population earnings of graduates than those who did not receive information, suggesting information had a positive impact on accuracy of expectations. This increase in accuracy translates into higher beliefs about the population returns to a degree: parents who receive the information expect the population return to a degree to be £2350 larger than parents who did not receive the information (controlling for household characteristics). However, this does not translate into increased returns for their own

children, and thus does not change plans to apply to university. Our results are consistent with the idea that parents have private information about their child's future labour market outcomes (e.g., child's ability, job network), such that beliefs about their child are less responsive to information than beliefs about population labour market outcomes.

Our paper belongs to a long tradition of work seeking to determine whether expectations about future earnings (or about returns to schooling) influence university attendance, university field of study or occupation choice (e.g., Willis and Rosen, 1979; Berger, 1988; Flyer, 1997; Arcidiacono, 2004; Buchinsky and Leslie, 2010; Beffy et al., 2012). The prior literature has relied on various types of assumptions (such as myopic or rational expectations) for the mapping between realized earnings and expected earnings. However, existing research from both developed and developing countries has found that individuals tend to be misinformed about the returns to schooling (e.g., Betts, 1996; Jensen, 2010; Wiswall and Zafar, 2015). This has prompted some empirical work on educational choice using expectations data about future earnings. We contributes to this growing literature investigating the role of subjective expectations about the pecuniary returns to education on educational plans or achievement (e.g., Jensen, 2010, Delavande and Zafar, forthcoming, Wiswall and Zafar, 2015a). Our setting is quite unique in that we have expectations of both parents and young people.[4] Parents are likely to be very important in those educational decisions.

Our paper also contributes to a literature investigating the effects of providing information on earnings (e.g., Jensen, 2010, Wiswall and Zafar 2015a, Bleemer and Zafar, 2018) on education-related expectations. For example, Wiswall and Zafar (2015a) find that students at a selective US university are misinformed about returns to college majors, and providing such information impacts intended major choice. Our results suggest that the nature of the expectations (whether it pertains to own child's earning or population's earning) and context might influence how responsive expectations are to new information. In our study, population earnings are more malleable than expectations about own/child's earnings, a result similar Ciancio et al. (2019) who find that population survival expectations are more responsive to information about mortality risk than own survival expectations.

[4] Giustinelli (2015) also analyses expectations of parents and young people and studies the joint decision-making. Attanasio and Kaufmann (2014) also have information on mothers and young people's expectations.

The paper is organised as follows. Section 3 examines the accuracy of parent's labour market expectations while Section 4 investigates the relationship between expected returns and human capital accumulation. In Section 5 we present the effect of providing information about the labour market return to a degree on university-related expectations.

2. Descriptive analysis of Subjective Expectations

2.1 Sample

The data we use comes from the Innovation Panel (IP) of the UK Household Longitudinal Study (UKHLS). The UKHLS is a longitudinal study that interviews over 40,000 representative households in the UK annually. The IP of the UKHLS uses a sample of 1,500 households to test innovative ways of collecting data and for developing new areas of research.[5] The innovation Panel sample is a clustered, stratified and equal probability design. The survey is fielded over the phone, internet and face to face. The present paper uses wave 8 (Spring 2015), wave 9 (Spring 2016) and wave 10 (Spring 2017) of the IP where a special module designed by Delavande and Zafar on higher education expectations was fielded. Young people aged 16 to 21 and not currently at university and parents of children ages 10 to 21 were asked a series of detailed questions regarding expected university-related outcomes for themselves or a co-resident child. In addition, half of the wave 8 respondents were randomly provided information about earnings and employment prospects of university graduates and individuals without a degree.

A total of 169 young people and 332 parents participate in the module. We restrict our sample to young people who are under the age of 19 and parents who are responding to questions about children who are under 19.[6] This gives us a sample of 104 young people and 324 parents. The young people are respondents aged between 16 and 18 and are either: not full-time students, or are a full-time student not in higher education. The parents are respondents whose co-resident child is aged between 10 and 18 and in full time education, but not higher education. Sample characteristics are shown in table 1, along with a comparison with the UKHLS sample of parents of children aged 10 to 18. The IP parents are more likely to be White (71% vs. 60%) and higher income (55% vs. 50%) than the UKHLS parents (where high income households are defined as those earning more than £3,397 per

[5] Understanding society website https://www.understandingsociety.ac.uk/documentation/innovation-panel visited 07/09/2018

[6] This is due to the UK institutional setting. Anyone who is 19 and not in higher education has most likely already chosen not to go into higher education.

month, the IP median gross household income). But they look similar in term of education, with 58% of the IP parents living in a household where at least one parent has a university degree (vs 56% in the UKHLS).

2.2 Overview of the Expectations

At waves 8 and 9 of the IP, respondents are asked a series of university-related expectations. Most questions are elicited using a percent chance format on a scale from 0 to 100%. The detailed wording of questions is presented in Appendix A1 and summarized as follows:

(1) *Expectations of university-related outcomes*: the percent change of (i) having a degree by age 30, (ii) gaining the qualifications to go to university; (iii) applying to university; (iv) applying to university if all costs were forgone via a scholarship; and (v) graduating conditional on going to university;

(2) *Expected labour market returns to a university degree*: expected earnings at age 30 and 45 conditional on working full-time and conditional on (i) going to university and (ii) not going to university; and the percent chance of being employed at age 30 conditional on (i) going to university and (ii) not going to university;

(3) *Knowledge about labour market returns to a university degree:* population earnings of 30-year old of the respondent's (or child's) gender with and without a degree.

(4) *The expected monetary cost of going to university:* Expected tuition and expected loan.

An overview of respondents' expectations is presented in Table 2 (parents) and 3 (young people). Response rates are high (above 87% for parents and children), except for the monetary cost of going to university where they are 10 to 20 percentage points lower. Parents report on average a 68% chance that their child will have a university degree by age 30. The differences in expected university outcome by parental education are clear in the very first question: while 78 percent of parents belonging to university degree households believe their child would have a degree by age 30, only 54 percent of their counterpart believe so (difference statistically significant at the 1% level). This difference in expected outcome stems from differences in all the steps of the way to acquiring a degree: parents from a university degree household have higher expectations for the chance of qualifying to university (83 vs 65%), the chance of applying conditional on qualifying (83 vs 68%) and the chance of finishing university conditional on going (91 vs 87%). Differences in application expectation persist by household degree status even when costs are forgone - parents from a

household with a degree report a 13 percentage point higher probability of applying with a scholarship and 15 percentage point without. These relationships continue to hold in multivariate regressions (table 4). This suggests that there are differences other than financial constraints that explain the gap in expected university outcomes by household degree. While there are differences in expectations by household income, they are substantially smaller than by household degree. In fact, with the exception of the expectations to apply to university, parents from high and low income households do not have statistically different expectations for their children. Regarding gender differences, parents of girls tend to have slightly more positive expectations about university-related outcomes than parents of boys, although the differences are spastically significant only for the chance of qualifying to university. Young people's university-related expectations tend to mirror those of their parents, although children coming from households with a university degree have slightly lower expectations than their parents, resulting in a smaller gap in expectations by household education.

The expected labour market returns to a degree are theoretically an important driver of the decision to go to university. We define three measures of returns to a degree:

- *Earnings returns at age 30*: $w_{degree} - w_{no\ degree}$ where w is the expected earnings at age 30.
- *Employment returns at age 30*: $P(job|degree) - (job|no\ degree)$
- *Labour market returns at age 30* of going to university. If a young individual goes to university, she faces some uncertainty about whether she will complete her studies, and whether she will be employed conditional on completing her degree. Assuming for simplicity no earnings if unemployed, her expected earnings at age 30 are thus given by $P(graduate)P(job|degree)\log w_{degree} + \big(1 - P(graduate)\big)P(job|no\ degree)\log w_{no\ degree}$. If she does not go to university, her expected earnings at age 30 are given by $P(job|no\ degree)\log w_{no\ degree}$. The overall labour market returns to a degree are the difference between those expected earnings given by:

$$P(graduate)(P(job|degree)\log w_{degree} + P(job|no\ degree)\log w_{no\ degree}).$$

The first measure focuses on returns in terms of earnings only; the second measure focuses on returns in terms of employment only; the third measure takes into account the uncertainty associated with graduating and finding a job.

Revisiting table 2 we see that parents perceive overall a positive payoff for their children to a university degree versus no university degree. They expect their children to earn £33.5k p.a. on average if they have a university degree, compared to £24.3k p.a. without a degree. They also perceive a benefit in terms of employment probability at age 30 (91% with a degree versus 87% without). Parents from a high income household or from a university degree household expect their children to earn significantly more with a degree *and* without a degree than their counterparts. They also expect their children to have a more favourable earnings growth. These differences in earnings expectations are quite large and significant (e.g., £4.5k p.a. with a degree and £4k p.a. without a degree at age 30). However parents from more privileged backgrounds do not expect higher earning returns (differences in earnings with a degree and without a degree) than parents from less privileged backgrounds. Similarly, there are no differences in the overall labour market return to a degree (see table 4, column 9).

This difference in earnings expectations with and without a degree could be due to different beliefs about children's ability, or different access to job networks. Interestingly, these differences do not seem to be driven by a difference in knowledge on the population earnings returns to a university degree. To directly test respondents' knowledge we asked them about the average earnings of current 30 years old, who have a degree, and those of 30 years old who do not have a degree. For the population earnings of graduates, parents from all backgrounds tend to have very similar perceptions. The difference in population earnings without a degree between high and low income (resp. household with a degree and without a degree) are statistically significant but small in magnitude, resulting in no statistically significance differences in the earnings returns. See also results in table 4, column 11. We investigate the accuracy of beliefs in more details in section 3.

Parents of male children expect higher earnings than those of female children, consistent with the gender pay gap. These differences by child's gender are still statistically significant in a multivariate regression (Table 4, columns 6 and 7). Note that these differences hold for earnings both with and without a degree, resulting in no differences in the returns to a degree by gender.

Young people's future earnings expectations are quite similar to those held by their parents when looking at the overall average, but seem more balanced by family background. There are no statistical differences in earnings expectations by household degree or household income in multivariate analysis (table 5). The direction of the heterogeneity in belief is actually reversed in some cases, with young people coming from non-university household expecting on average higher earnings than their counterpart (table 3 and 5). Note however that the sample sizes are quite smaller than those of parents.

When it comes to costs, parents and young people expect to pay between £7.5k on average in tuition per year, and to take loans of a similar amount. Parents from university degree households expect to pay more in tuition than their counterpart, reflecting either differences in knowledge about university tuitions or different expectations in what university their children would attend. In England, tuition fees are capped at £9,250 a year for UK and EU students, with around 76% of all institutions charging the full amount in 2015-16. Contrarily to their parents, young people with no household degree expect to pay higher tuition than their counterparts. Those differences hold in multivariate analysis (tables 4 and 5).

A correlation table of parents' expectations about labour market outcomes is presented in Table 6. As one would expect, the expectations about university-related outcomes are positively related to each other. There is a positive correlation between parents' perceived population earnings and the expected earnings for their children both with and without a degree (correlation of about 0.5). Finally, there is also a positive correlation between expected earning and expected employment prospect (correlation of about 0.17).

2.3 Link Between Parents and Children's Subjective Expectations

A unique feature of this data is that we have both parents and their child's subjective expectations. Parents are likely to be an important source of information for children. We investigate this relationship in table 7. In every specification we use the child's expectation as our dependent variable and their parents' expectations as our independent variables of interest. We consider the separate effect of mother and father expectations and include missing dummy variables for instances where one of the parents response is missing. These regressions exclude children who have both parents missing (18% of the children's sample).

In terms of university-related outcomes, we find a strong association between the children and parents' subjective expectations. For example, a 10% increase in their father's (mothers)

expectations of having a degree by age 30 is associated to a 4.7% (3.0%) increase in their child's beliefs, statistically significant at the 1% level.

Looking at earnings, we find that mother's expectations are positively associated to their child's expected earnings with a degree, while the father's expectations are associated to their expected earnings without a degree. For example, a £100 increase in mothers expected earnings for her child with a degree is associated with a £49 increase in their child's expected earnings for themselves, statistically significant at the 1% level (table 7, column 5). In contrast, there is no relationship between parents and children's expectations about population earning or expected cost.

3. Accuracy of Beliefs

3.1 Earnings

We use parents' expectations about current population earnings to assess their accuracy in beliefs. We compare parents' beliefs with population earnings data by gender and degree status from the Labour Force Survey (LFS) Income and Education Analysis using quarterly data between 2004Q2 -2011Q1. The 'True Value' for men is £27,100 with no degree and £39,700 with degree, and £22,600 and £33,800 for women respectively.

We define "error" by subtracting their beliefs from the 'True Value', so a positive (negative) error stipulates that the respondent underestimates (overestimates) population earnings. As the error takes positive and negative values, a mean error of zero does not necessarily represent a low level of error, we also use the absolute value of the error. Table 8 shows that the mean error is positive in every category - parents typically underestimate population earnings, by around £5k with a degree and £3k without (Column 1a, Table 8). As a result, parents underestimate the returns to a degree by around £2k. A relatively large standard deviation indicates considerable heterogeneity in beliefs –this is particularly striking for earnings with a degree: the 10^{th} percentile is -£6.2k (-18%) while the 90^{th} percentile is +£13.8k (+37%). Figure 1 presents the earnings return errors and show that about two-third of parent's under-estimate the return to a degree. This is potentially important as we expect earnings return to be important for the decision to apply to university (see also section 4).

We further assess how the accuracy varies by characteristics in a multivariate analysis using the errors and the absolute value of the error (table 9) and an indicator for accuracy defined as reporting perceived population earnings within 10% of the actual value (table 10). We are

particularly interested in the difference by households SES status to investigate whether the SES gap in university application may be partly driven by a SES knowledge gap. We find a very limited association between SES and accuracy about the earnings returns. High income households appear more accurate about both the earnings with and without a degree, resulting in no difference for the return. Household with a degree appear more accurate about the earning returns without a degree. This does not translate in smaller average error, or more accurate perception according to our accuracy indicator, when looking at the returns (Table 9, column 5; Table 10, column 3). But we do see an effect in the absolute value of the error for returns (Table 9, column 6) suggesting that households with a degree are less likely to make large mistakes in either direction.

We find that parents of male children are more inaccurate than parents of female children about earnings with and without a degree, but the inaccuracy balances out resulting in no differences in the returns. Finally we observe that older parents typically underestimate the expected returns by over £3.8k – driven by the fact that they overestimate earnings without a degree by over £3k.

3.2 Employment

Respondents are asked their expectations that their child/they will be employed at thirty both with and without a degree. Unlike for earnings, they were not asked about the current population employment rates so we cannot directly assess knowledge about employment prospects. Nevertheless, it is still interesting to compare current employment rates with employment expectations. Using the LFS, we obtain an employment rate of 97% with a degree at thirty for both men and women, and 92% for men and 93% for women with no degree. Using these figures we construct parent's employment "difference" by subtracting their expectations from the current employment rates. We do not call this an error as the difference may reflect private information respondents have about themselves/their children, beliefs about the economy and future employment rates and errors about the current population unemployment rate.

Table A1 in the appendix shows an average difference of 5.6 percentage point both with, and without, a degree, suggesting that they are more pessimistic for their children's employment than is warranted with the current employment rate. There is however a nontrivial amount of parents who are more optimistic – as indicated by the significantly larger mean absolute value of errors. This is particularly true for difference without a degree where the 50^{th} percentile is -

7 and the 90th percentile is +42. Using multivariate analysis we find that these differences do not differ by observable characteristics (table not shown).

4. Expected Returns and Expectations of Applying to University

We have focused on the returns to degree as those are thought to be important drivers in the decision to apply to university. We investigate this directly by looking at the relationship between the application intentions and expected returns. Using an OLS specification we find that parent's application expectations are positively associated to their expected returns (Table 11). Moreover, the effect is large. For example, an increase from the 50th to the 75th percentile of expected earnings returns (respondents labour market earning returns) leads to an increase of 31 percentage point in the probability to apply to university (table 11, column 1). The same increase in labour market returns leads to an increase of 72 percentage points in the probability to apply (Table 11 column 2) while an increase in employment returns by the same proportion increases the probability of applying by 6 percentage points (Table 11, column 3).

Focusing on young people, we find that application expectations are only associated with the expected returns for male children (Appendix Table A2). This is consistent with existing evidence that men's educational decisions tend to be more driven by pecuniary factors (e.g. Malgwi et al., 2005).

Because we have data on parents and children, we can also investigate whose expectations – parents' or own– about the returns to a degree seem more relevant to the child's application intentions. Table 12 uses multivariate analysis regressing the child's application intentions on the child's, mothers and fathers expected returns with our usual controls. Our results show that it is the child's expectations that are positively associated to their enrolment probability. There is no statistically significant association between the parents expected returns and the child's application intentions once the child's expected returns are controlled for.

5. Effect of a Randomized Information Intervention on Subjective Expectations

Half of the households in wave 8 that were eligible for this module were provided information about the average annual earnings for men and women aged 26-34 who are

working full time with, and without, a degree, and their respective employment rate.[7] Households received the information sheet presented in Appendix A2 just after their wave 8 interview, and by post again about 6 months prior to their wave 9 interview.

Table 13a and 13b show that the treatment and control groups are balanced on baseline expectations and on most demographic characteristics. However, households in the treatment group are 15% more likely to have at least one parent with a University Degree than the control group at baseline. Our analytical sample for this section includes respondents who were interviewed at both waves 8 and 9. This resulting sample is very similar to the baseline sample in terms of characteristics. Again, it is balanced on expectations and most characteristics by treatment group, except for household degree. We discuss this at the end of section 5.2.

We investigate the effect of the information intervention on respondents' accuracy and subjective expectations by estimating the following ANCOVA specification:

$$Y_{i,t+1} = \alpha T_i + \gamma Y_{i,t} + \beta X_i + \epsilon_i$$

Where $Y_{i,t+1}$ is individual i's wave 9 outcome, T_i is a treatment dummy equal to one if individual *i* received the treatment and zero otherwise, $Y_{i,t}$ is *i*'s outcome at wave 8, X_i are demographic characteristics. Note that our standard errors are clustered at the household level, which is the level of the randomization.

5.1 Treatment Effect on Parents Expected Earnings Accuracy

By providing information on population earnings, the treatment may have improved respondents' accuracy in that regard. We therefore start by investigating its impact on the accuracy of parent's beliefs about the average earnings at 30. Figure 2 shows that the distribution of error in population earnings for the treatment group has its mode closer to zero compared to the distribution of the control group for the earnings with a degree (left panel) but there is no large difference for the earnings without a degree (right panel). We see similar patterns in Table 14. The first column shows that parent's beliefs about population earnings with a degree at 30 who received the information are 15% more likely to be within 10% of the True Value and the fourth column shows that they are 14% more likely to be within £3k

[7] The treatment assignment was implemented prior to wave 8 by using a random number generator and a cut-off at the household level whereby households above (below) a certain number were assigned to the treatment (control) group. Stratified sampling was not used.

of the True Value (both significant at the 1% level). Similarly, Table 15 shows that the treatment reduces parental error by £1.5k in absolute terms (column 2). This evidence shows that the provision of information reduces the mean error in beliefs about population earnings with a degree. It is worthwhile to note that we only observe treatment effect on the accuracy of population earnings with a degree, even though there is substantial error at baseline about population earnings with no degree.

5.2 Treatment Effect on Parents Expectations

We next explore how parents update their beliefs and expectations in response to the information we provided. Table 16 reports the coefficient associated with the dummy Treatment on parental expectations. Row (a) shows the results for all parents. We find that the information treatment increase expectations about population returns by £2.4k (statistically significant at the 5% level). The effect is similar for mothers (row b) and fathers (row c), although slightly less precisely estimated for fathers (p-value=0.13). This increase in perceived population return is not accompanied by an increase in the returns to a degree for their own child. In rows (a) to (c), the coefficients associated with the treatment dummy are positive but much smaller in the specification for child's return compared to population returns, and the standard errors are very large. Although our sample is relatively small, this suggests that expected returns about own child, for whom parents may have quite a lot of private information, is less responsive to general information about the labour market than beliefs about population return.

Our intervention also included information about employment rate. Row (a) shows no effect on the subjective probabilities of employment when we look at all parents, but we see an 8 percentage point increase in the probability of employment with a degree for mothers (statically significant at 10%), and a 7 percentage point decrease for fathers (statistically significant at 5%). Perhaps not surprisingly given that there is no change in the expected returns to a degree for their child, there is no statistically significant treatment effect on the expectations to apply to university or the chance to have a degree at age 30.

Despite the relatively small sample size, rows d-g investigates the heterogeneity in treatment effect using interactions by: (i) child's gender, (ii) SES, (iii) household degree, (iv) baseline accuracy. Overall, there does not seem to heterogenous treatment effects according to these categories.

Recall that our treatment group is more educated than the control group. While we control for household degree in all our specification, Table 17 shows that our results are robust to using regression adjustment as in Cattaneo (2010) (column c) and propensity score matching, on baseline beliefs and observable characteristics (column d).[8] The treatment effects on population returns to a degree are of similar magnitude as in the OLS specification, and precisely estimated. There is also a large (6 percentage point) and precisely estimated treatment effect on the probability to apply to university when using propensity score matching. But this result does not hold in the regression adjustment, and therefore seems sensitive to the underlying assumptions. For propensity score matching, similarity between subjects is based on estimated treatment probabilities, while for the regression adjustment it is based on a weighted function of the covariates for each observation.

5.3 Treatment Effect on Children's Expectations

We only have 73 young people who participated both in waves 8 and 9. We still present the treatment effect for children in tables 17 (column a) and 18. While none of the coefficients associated with treatments are statistically significant, the magnitude of the effects on own versus population earnings are different than what we have observed for parents. The coefficient associated with treatment is £2.8k for own earnings returns, compared to £0.5k for population returns. It is plausible than young people have more malleable expectations about their own labour market outcomes than their parents.

6. Conclusion

Increasing social mobility is high on the government agenda in the UK, and many other countries. Widening participation into Higher Education is one possible pathway but, despite recent effort, there is still a large gap participation between high and low SES. We investigate whether differences in knowledge about the labour market returns to a degree might be responsible for this gap. Our focus on the perceived labour market returns to a degree stem from the fact that they ought to be an important driver of the decision to go to university. Indeed, in our data, parents/young people who expect higher labour market returns from a degree also expect a higher probability that their child/they will apply to university.

[8] Using a matching strategy we create a potential outcome for each respondent by comparing all the respondents in the treatment (control) group with a respondent who looks most similar to them in the control (treatment) group. We then and take the average of the difference between the observed and potential outcome for each respondent.

Our detailed subjective expectations data reveal two important facts. Parents and young people from various SES backgrounds hold similar beliefs about the earnings return and employment returns to a degree. Moreover, parents under-estimate on average the population earnings return to a degree. It is therefore unlikely that the information gap about the labour market advantage of a degree explains the SES gap in participation. But providing information on earnings may help all families to make better informed-decision, irrespective of SES background.

We have also found that a very light-touch information intervention, such as showing some statistics about population earnings and employment to families, is powerful enough to change parents' expectations about population earnings so that they become more accurate, with changes still visible 6 months later. This information also increased participants' perceptions about the returns to a degree in the population. However, this intervention did not change parents' perceptions about the future labour market outcomes of their own children. Possibly due to private information, those may be less responsive to information about population statistics.

We also provide indirect evidence that financial constraints at the time of university application are not a major factor in the decision to apply as differences in application expectations persist by family background even in the hypothetical situation of being provided a scholarship that would cover all costs. This does not mean that financial constraints are irrelevant; rather that they may matter earlier on - by affecting primary and secondary school quality, for example, or access to tutoring.

More research is needed to better understand the underlying mechanism explaining the gap in higher education application by socio-economic status. Psychological costs are found to be important for educational choices (Delavande and Zafar, forthcoming; Eisenhauer et al., 2015) and those may be different for individuals who come from different backgrounds. Information gaps might still be relevant in other domains than labour market returns to a degree, such as the non-pecuniary returns to a degree (Boneva and Rauh, 2017, Beffield et al. 2018).

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Appendix

A1 Complete list of expectations questions asked in Waves 8 and 9:

Next we have a few questions about your [son/daughter] [CHILD NAME]'s education plans. On a scale from 0% to 100% where 0% means 'No chance of happening' and 100% means 'Totally likely to happen', please tell me how likely it is that the following events will happen to [CHILD NAME] in the future.

How likely is it that [CHILD NAME] will have a university degree by age 30?

How likely is it that [CHILD NAME] will gain the required qualifications to get into university?

Suppose [CHILD NAME] gains the required qualifications to apply to university. How likely is it that [CHILD NAME] will apply to university?

Suppose [CHILD NAME] gains the required qualifications to apply to university. How likely is it that [CHILD NAME] will apply to university if all costs (tuition, books, boarding, etc) were paid out of a scholarship, grant, bursary or fee reduction scheme?

Excluding any scholarship, grant, bursary or fee reduction scheme that [CHILD NAME] might receive, how much do you expect [CHILD NAME] to pay as yearly tuition if he/she goes to university

How much does [CHILD NAME] expect to borrow yearly in student loans if he/she goes to university

Suppose [CHILD NAME] gains the required qualifications to apply to university, applies, and gets a place. How likely is it that [CHILD NAME] will finish his/her studies?

How likely is it that [CHILD NAME] will be working at age 30 if he/she has a university degree?

How likely is that [CHILD NAME]will be working at age 30 if [CHILD NAME] does not go to university at all?

Look ahead to when [CHILD NAME] will be 30 years old and suppose that he/she is working then. Think about the kinds of jobs that will be available to [CHILD NAME]. Assuming that one pound today is worth the same as one pound when [CHILD NAME] is 30 years old, if he/she had a university degree, how much do you think [CHILD NAME]could earn per year on average at the age of 30

And how much do you think [CHILD NAME] could earn per year on average at the age of 45 if he/she had a university degree?

Which of these do you think might fairly represent [CHILD NAME]'s yearly earnings at age 45 if he/she had a university degree?

Look ahead to when [CHILD NAME]will be 30 years old and suppose that he/she is working then. Think about the kinds of jobs that will be available to [CHILD NAME]. Assuming that one pound today is worth the same as one pound when [CHILD NAME] is 30 years old, how much do you think [CHILD NAME] could earn per year on average at the age of 30 if he/she did not go to university at all?

And how much do you think [CHILD NAME] could earn per year on average at the age of 45 if he/she did not go to university at all?

Think about all current 30 year old women / men who are working full time. What is the average amount that you believe these workers currently earn per year if they have a university degree?

What is the average amount that you believe all 30 year old Women / men currently earn per year if they did not go to university at all?

Note that for all the earnings expectations, the following follow-up question was asked if the respondent initially said 'Don't know':

Which of these do you think fairly represents the annual earnings
The response options are bracketed incomes that start at £10,000 p.a. and increase by £5,000 incrementally with the largest value being £100,000 p.a. These secondary responses were combined with the initial responses via bracketed means. The proportion of "don't knows" varies between 9% and 11%.

Appendix A2. Information Treatment provided to households in-between IP waves 8 and 9.

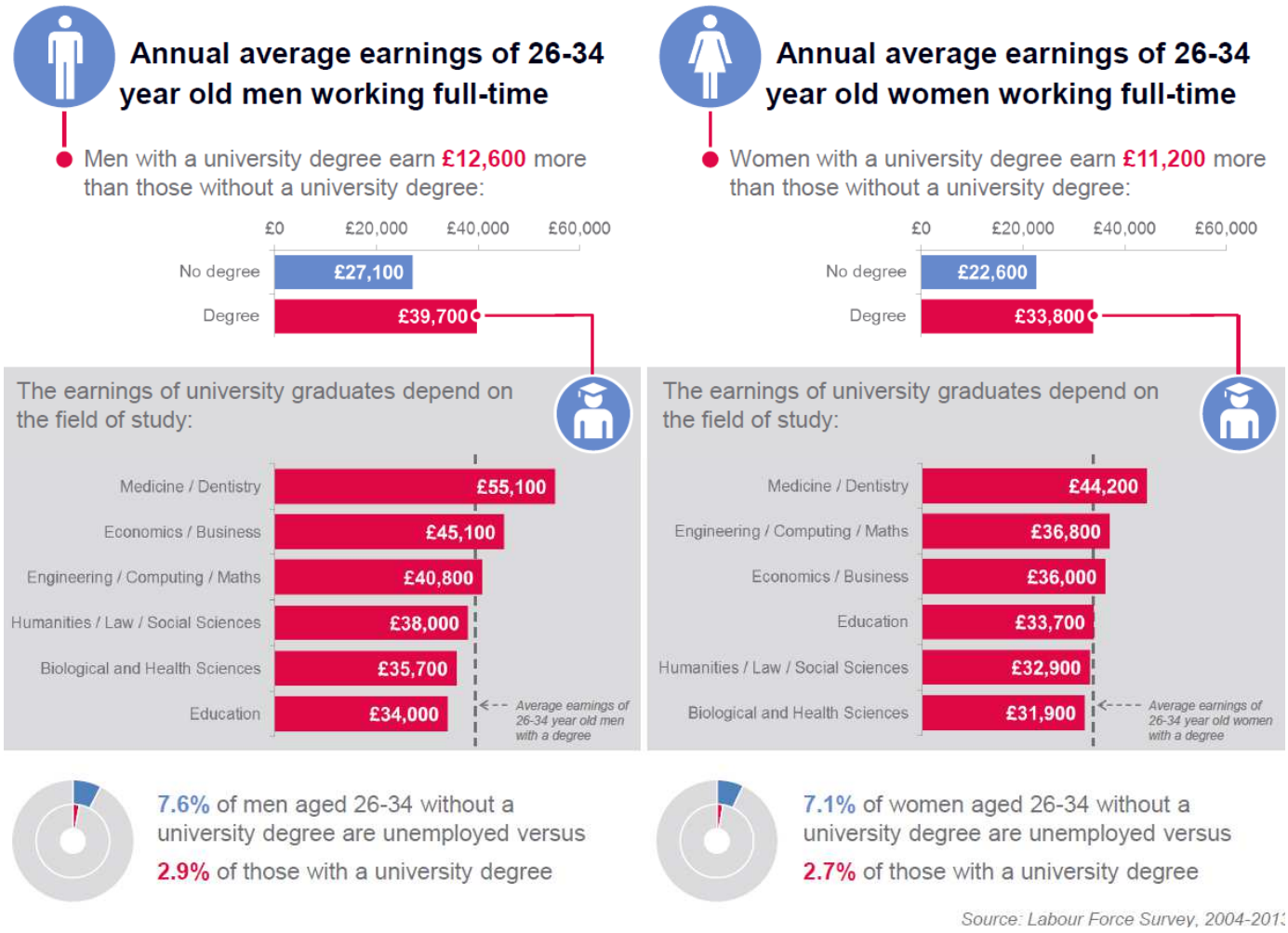


Table 1 Distribution of sample across observed characteristics (Percentage)

	(1)	(2)	(3)
	Innovation Panel		UKHLS Mainstage
	Child[+]	Parent	
High Income[++]	58.7	54.8	49.7
White British	78.9	71.2	60.4
Other	17.3	11.8	35.0
Missing	3.8	17.0	4.6
Living in England	96.2	89.2	87.8
HH Degree	53.9	57.9	56.4
Father		37.8	48.1
Male Child	47.1	53.3	
Female Child	52.8	46.7	
Only Father responds	6.7	9.5	
Father and Mother Respond	44.2	58.4	
Only Mothers Respond	35.6	32.1	
No Parent Responds	13.5		
Children 18 years old	29.8	7.12	
Parent Over 45		53.3	
Maximum Observations	104	324	29,498

Columns 1-2 report the sample characteristics of the children and parents we use from the Innovation Panel. Column 3 reports the sample characteristics of parents of children aged 10 to 18 from the Mainstage of the UK Household Longitudinal Study. Parents are asked question about their co-resident child.

[+]We define child as young people who are between 16 and 18 and are in full time education (but not higher education)

[++] High income is defined as gross monthly Household earnings greater than the IP median gross household income (£3397 per month or around £41k p.a.)

Table 2. Parents' subjective expectations, wave 8

			Child Sex		Household Income		Household Education	
Variables	Mean (£1k's or %)	Response Rate (%)	Female	Male	Low	High	No Degree	Degree
Chance of a Degree by 30	68.02	95	70.2	66.1	64.4	70.7	54.4***	77.8
Chance Qualify for University	75.63	95	79.4**	72.2	73.0	77.6	65.1***	83.2
Chance of Applying to University	76.93	96	78.3	75.7	73.0*	79.9	68.3***	83.2
Chance of Applying With Scholarship	82.45	96	83.9	81.2	80.8	83.7	75.2***	87.5
Chance Finish University	89.59	96	91.5	87.8	89.2	89.8	86.9*	91.1
Childs Expectations								
Expected Earnings at 30 With Degree	33.49^{++}	87	31.3***$^{++}$	35.4^{++}	32.1*$^{++}$	34.5^{++}	30.7***$^{++}$	35.2^{++}
Expected Earnings at 30 No Degree	24.31	87	22.8***	25.6	23.0**	25.3	21.9***	25.9
Expected Returns to a Degree 30	9.80	83	9.9	9.7	10.1	9.6	10.2	9.6
Expected Earnings at 45 With Degree	43.79^{++}	87	40.4***$^{++}$	46.8^{++}	39.4***$^{++}$	47.0^{++}	38.7***$^{++}$	47.0^{++}
Expected Earnings at 45 No Degree	30.00	87	28.0***	31.8	26.0***	33.2	26.1***	32.6
Expected Returns to a Degree 45	15.10	82	14.8	15.1	15.7	14.4	15.1	14.9
Chance Employed With Degree	91.40	93	92.1	90.8	91.0	91.8	90.0	92.3
Chance Employed With No Degree	86.83	93	88.8	85.1	87.5	86.3	86.4	87.2
Expected tuition	7.05	78	7.19	6.92	6.78	7.23	5.99**	7.56
Expected Tuition England Only	7.48	78	7.33	7.61	7.44	7.50	6.56**	7.91
Expected Loans	7.55	68	7.94	7.23	7.51	7.58	6.60	8.05
Population Beliefs								
Expected Earnings at 30 With Degree	32.04^{++}	89	30.7***$^{++}$	33.2^{++}	31.2^{++}	32.7^{++}	31.7^{++}	32.3^{++}
Expected Earnings at 30 No Degree	22.10	89	20.7***	23.3	21.1**	22.9	21.2*	22.8
Expected Returns to a Degree at 30	9.910	83	9.9	9.9	10.3	9.6	10.6	9.4
Maximum Observations	323		151	172	146	177	136	187

Stars indicate statistical significances at the 10%(*), 5% (**) and 1% (***) levels. The Plus's indicate statistical significance between the 'with, and without, a degree' labour market outcomes at the 5% ($^{+}$) and 1% ($^{++}$) levels. For example the +'s next to the expected earnings at 30 with degree mean that the respondents expected earnings with a degree is statistically different from their expected earnings without a degree at 30.

Table 3. Young people's subjective expectations, wave 8

			Sex		Household Income		Household Education	
Variables	Mean (£1k's or %)	Response Rate (%)	Female	Male	Low	High	No degree	Degree
Chance of a Degree by 30	65.25	93	66.3	64.2	62.1	67.6	59.1	70.3
Chance Qualify for University	71.42	95	71.7	71.2	73.2	70.1	65.1*	77.0
Chance of Applying to University	72.48	96	73.1	71.7	71.1	72.9	69.7	75.1
Chance of Applying With Scholarship	80.39	96	81.2	79.3	79.0	81.3	81.6	79.2
Chance Finish University	87.56	98	88.6	86.4	89.4	86.3	88.0	87.2
Own Expectations								
Expected Earnings at 30 With Degree	36.21^{++}	92	34.2^{++}	38.4^{++}	34.8^{++}	37.2^{++}	36.7^{++}	35.7^{++}
Expected Earnings at 30 No Degree	26.57	91	24.1*	29.3	26.0	27.0	27.5	25.8
Expected Returns to a Degree 30	8.9	84	9.8	8.0	8.8	9.0	8.8	9.0
Expected Earnings at 45 With Degree	46.21^{++}	91	42.5^{++}	50.2^{++}	44.2^{++}	47.7^{++}	43.0^{++}	49.1^{++}
Expected Earnings at 45 No Degree	32.80	88	30.9	34.9	33.1	32.6	33.9	31.9
Expected Returns to a Degree 45	13.0	87	12.3	13.8	12.9	13.1	9.9**	15.7
Chance Employed With Degree	88.73	98	89.0	88.4	90.0	87.8	86.3	90.7
Chance Employed With No Degree	82.10	92	79.3	85.5	85.1	79.9	83.0	81.3
Expected tuition	7.69	73	7.8	7.6	7.2	8.0	9.6***	6.3
Expected tuition England Only	7.82	73	7.8	7.8	7.5	8.0	9.56**	6.5
Expected Loans	7.42	63	7.6	7.2	8.6	6.6	8.7	6.3
Population Beliefs								
Expected Earnings at 30 With Degree	31.22^{++}	88	30.4^{++}	32.1^{++}	29.8^{++}	32.3^{++}	30.3^{++}	31.2^{++}
Expected Earnings at 30 No Degree	22.67	88	21.7	23.8	22.3	23.0	21.8	23.5
Expected Returns to a Degree at 30	8.53	88	8.7	8.4	7.5	9.4	8.4	8.6
Maximum Observations	104		55	49	39	65	49	55

Stars indicate statistical significances at the 10%(*), 5% (**) and 1% (***) level. The Plus's indicate statistical significance between the 'with, and without, a degree' labour market outcomes at the 5% ($^{+}$) and 1% ($^{++}$) levels. For example the +'s next to the expected earnings at 30 with degree mean that the child's expected earnings with a degree is statistically different from their expected earnings without a degree at 30.

Table 4. Parents Subjective Expectations on observable characteristics, OLS

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
	University Related Expectations					Earnings Expectation For Own Child				Earnings Beliefs for Population			Employment Exp for Own Child			Expected Costs	
	Chance Degree 30	Pr Qualify for University	Pr Apply	Pr Apply With Scholarship	Pr Finish University	Exp Earn With Degree 30	Exp Earn No Degree 30	Earnings Returns at age 30	Labor Market Returns age 30	Exp Earn Pop With Degree	Exp Earn Pop No Degree	Earnings Returns at age 30 Population	Pr Emp With Degree	Pr Emp With No Degree	Pr Emp Returns	Expected Tuition	Expected Loan
Child 15 or over	1.307	-1.708	5.878	0.366	2.042	673.0	-1142.7	1443.4	0.347*	817.5	-56.21	1433.1	-0.970	-3.280	1.995	-751.0	598.0
	(4.661)	(4.314)	(4.134)	(4.267)	(3.151)	(1858.7)	(1296.9)	(1361.2)	(0.192)	(1268.8)	(940.5)	(1007.3)	(2.182)	(3.082)	(1.795)	(726.3)	(1061.2)
Parents Over 45	1.256	2.173	1.182	0.00533	0.517	2114.2	2107.8	-331.8	-0.119	-628.5	3008.5***	-3800.8***	1.189	1.209	-0.744	825.4	-354.3
	(4.657)	(4.552)	(4.098)	(4.285)	(3.531)	(1935.0)	(1389.0)	(1397.4)	(0.187)	(1293.4)	(963.4)	(1022.8)	(2.345)	(3.356)	(1.705)	(721.0)	(1117.6)
Male Child	-5.137	-7.745**	-3.128	-3.544	-3.435	2990.7*	2725.4**	18.33	0.237	2935.1***	2806.4***	221.7	-1.672	-3.834	2.560	-36.28	-824.3
	(4.170)	(3.726)	(3.849)	(3.796)	(2.613)	(1720.5)	(1300.8)	(1403.8)	(0.215)	(1055.8)	(888.1)	(978.2)	(1.903)	(2.939)	(1.867)	(699.0)	(1127.7)
Male Parent	-4.262	-1.746	1.792	-1.665	0.967	2043.3	1103.4	1039.0	-0.216	308.0	-671.7	1510.6*	-1.942	-0.130	-1.347	-1194.7**	397.2
	(2.754)	(2.432)	(2.924)	(2.928)	(1.904)	(1386.2)	(919.5)	(1323.3)	(0.184)	(913.0)	(759.6)	(889.1)	(1.879)	(2.118)	(1.559)	(560.6)	(1044.5)
HH Degree	19.89***	14.92***	13.32***	11.44**	2.705	3418.2*	3255.2**	-422.5	-0.141	409.1	1261.0	-1145.6	2.858	2.353	0.241	1608.1**	1156.3
	(5.150)	(4.157)	(4.470)	(4.587)	(2.755)	(1954.4)	(1314.6)	(1407.9)	(0.212)	(1127.0)	(1004.6)	(1030.9)	(2.327)	(3.316)	(1.883)	(762.6)	(1102.5)
High Income	-1.497	-2.727	1.881	-1.906	-2.071	1906.7	1585.3	184.5	0.290	2676.5**	1771.3+	772.9	0.796	-1.349	2.286	-518.6	-890.4
	(4.827)	(4.438)	(4.216)	(4.135)	(3.222)	(2054.5)	(1620.0)	(1786.8)	(0.222)	(1341.6)	(1101.0)	(1021.5)	(2.394)	(3.263)	(1.889)	(756.4)	(1278.2)
Married	8.268	7.974*	3.035	6.124	3.736	-2531.6	-355.6	-2320.7	0.232	-2598.6*	-1528.5	-1375.8	-1.481	-1.498	2.504	196.4	1023.7
	(5.175)	(4.810)	(4.813)	(4.811)	(3.704)	(2126.2)	(1544.8)	(1616.9)	(0.259)	(1433.2)	(1139.7)	(1178.7)	(2.715)	(4.150)	(2.192)	(806.6)	(1456.8)
White British	3.589	2.231	-1.494	-4.172	-0.320	-501.4	399.1	-856.2	0.158	2612.3**	1325.5	653.9	-1.599	3.232	1.341	694.4	-919.9
	(5.749)	(5.399)	(4.997)	(4.576)	(3.549)	(2500.0)	(1842.4)	(1586.4)	(0.221)	(1136.4)	(1031.6)	(1100.5)	(2.939)	(5.105)	(1.959)	(722.8)	(1835.6)
Ethnic Other	11.08	8.076	1.700	0.297	1.912	3992.3	2610.0	2240.4	1.276**	7124.4***	1852.6	4902.8***	-1.027	-4.598	8.320**	169.0	491.1
	(7.745)	(5.811)	(6.160)	(5.899)	(4.107)	(3702.7)	(3213.8)	(3447.3)	(0.545)	(2066.4)	(1722.9)	(1374.7)	(3.841)	(6.538)	(4.070)	(1099.2)	(2202.5)
England	10.94*	13.36**	-0.864	-1.588	3.221	290.6	-1143.6	1810.0	0.0481	-1010.3	-1922.0	7.834	0.110	4.379	0.110	4240.4***	3233.4**
	(6.541)	(6.746)	(5.905)	(6.138)	(5.228)	(3428.2)	(2470.5)	(1801.4)	(0.233)	(1380.8)	(1543.5)	(1336.6)	(3.541)	(6.684)	(1.850)	(1147.9)	(1407.6)
constant	41.21***	61.33***	66.22***	80.57***	85.59***	32342.8***	19709.7***	11625.7***	-0.0703	28559.1***	19138.8***	15576.1***	92.86***	80.12***	-3.490	3127.6*	4418.4
	(9.398)	(8.976)	(9.276)	(9.521)	(6.849)	(4929.0)	(3764.9)	(3489.0)	(0.419)	(1796.2)	(1957.2)	(2148.1)	(4.727)	(9.030)	(3.494)	(1643.1)	(3085.9)
N	307	308	275	274	261	285	277	272	221	286	284	281	265	303	262	207	180

This table presents OLS regressions for the parent's labor market and university relative beliefs and expectations on their observable characteristics. The standard errors are reported in parentheses and the stars indicate statistical significant to our usual levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Ethnicity Missing is our reference category for white British and ethnic other. The standard errors are clustered at the household level. In

Column 8 and 12 Earnings Returns is defined as expected earnings at 30 with a degree minus the expected earnings with no degree at age 30. Column 9 uses *Labour market returns at age 30* of going to University which takes into account the uncertainty about if they will complete their degree and their employment prospects, conditional on degree attainment. It is calculated by taking the difference between the expected earnings with a degree : $P(graduate)P(job|degree)\log w_{degree} + \big(1 - P(graduate)\big)P(job|no\ degree)\log w_{no\ degree}$ and the expected earnings without: $P(job|no\ degree)\log w_{no\ degree}$.

[+]P>|t| 0.109

Table 5 Childs Subjective Expectations on Observable Characteristics, OLS

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
	University Related Expectations					Earnings Expectation For self				Earnings Beliefs for Population			Employment Expectations for Self			Expected Costs	
	Chance Degree 30	Pr Qualify for University	Pr Apply	Pr Apply With Scholarship	Pr Finish University	Exp Earn With Degree 30	Exp Earn No Degree 30	Earnings Returns at age 30	Labor Market Returns age 30	Exp Earn Pop With Degree	Exp Earn Pop No Degree	Earnings Returns at age 30 Population	Pr Emp With Degree	Pr Emp With No Degree	Pr Emp Returns	Expected Tuition	Expected Loan
Male	-0.159	-0.204	0.409	-2.476	-3.261	3710.3	5458.7*	-2069.5	-0.427	1839.3	2309.7	-450.1	-0.0969	5.849	-5.578	-489.7	73.54
	(7.167)	(6.436)	(8.503)	(8.035)	(4.212)	(3744.8)	(3236.7)	(2769.6)	(0.309)	(2408.9)	(1646.7)	(2020.8)	(3.419)	(4.706)	(3.961)	(1054.1)	(1670.9)
High Income	-2.034	-7.306	-3.400	0.390	-1.113	3213.9	821.4	146.5	0.372	1523.3	-107.6	1620.7	-4.432	-6.674	6.234	1082.2	-2863.8
	(7.703)	(6.261)	(9.448)	(8.975)	(3.807)	(3762.1)	(3788.7)	(3419.4)	(0.313)	(2477.5)	(1645.3)	(2099.4)	(3.443)	(4.994)	(4.780)	(1115.4)	(1782.1)
Household Degree	6.455	9.502	4.011	-5.618	-1.176	-1406.4	-2265.1	502.4	0.347	899.9	1209.2	-261.7	3.363	-3.085	3.660	-1836.5	-2611.5
	(8.290)	(7.560)	(8.753)	(7.153)	(4.144)	(3751.5)	(3652.0)	(2086.3)	(0.407)	(2544.3)	(1803.7)	(2361.6)	(3.602)	(5.650)	(5.771)	(1448.8)	(2518.2)
England	18.40	27.18	-23.21***	-9.547	-11.82***	7150.0**	5379.7	186.5	0.129	-3743.7	1611.8	-5377.2	24.39	-16.74***	4.461	5154.0***	8106.2***
	(23.44)	(22.78)	(8.228)	(5.911)	(3.492)	(3130.8)	(3730.9)	(2866.1)	(0.255)	(4673.9)	(2537.5)	(4811.9)	(26.18)	(5.577)	(4.374)	(1094.5)	(2254.0)
British Ethnicity	19.81	15.86**	41.66***	46.29***	22.40***	12883.2*	-5950.8**	9021.9***	0.924**	-1278.8	-6078.1***	4790.7**	12.59	13.14*	-0.0441	1398.8	-1584.0
	(22.46)	(6.898)	(10.38)	(13.97)	(7.008)	(6635.3)	(2950.7)	(2165.7)	(0.392)	(2301.2)	(1450.4)	(1935.3)	(9.678)	(7.132)	(5.771)	(2563.0)	(5285.9)
Ethnicity Other	18.18	7.491	26.75*	37.85**	27.92***	18164.3**	-2621.1	10083.9**	0.999	-2604.0	-6473.6**	3877.2	12.14	11.49	1.964	716.0	1184.8
	(24.67)	(10.10)	(14.97)	(17.58)	(7.692)	(7772.6)	(5582.0)	(4365.5)	(0.603)	(4224.4)	(2739.1)	(3502.6)	(10.44)	(7.711)	(6.900)	(3022.3)	(5580.2)
Parents Married	7.146	7.192	5.456	5.378	-3.935	-1551.1	1150.2	-1604.6	-0.320	1700.9	1558.3	98.23	-0.0431	4.762	-3.976	793.4	2582.9
	(9.690)	(8.410)	(10.09)	(9.084)	(4.424)	(4914.3)	(5432.4)	(3385.7)	(0.515)	(3094.9)	(2107.1)	(2758.9)	(3.990)	(7.123)	(7.739)	(1596.3)	(2743.9)
Constant	23.86	33.58	83.03***	85.79***	109.7***	13597.0	24028.0**	11713.9**	5.669***	30727.3**	24533.5**	8810.7	54.53**	97.03***	1.862	-1590.4	2723.8
	(33.41)	(24.99)	(17.40)	(17.21)	(8.231)	(8710.5)	* (5262.0)	(4449.6)	(0.616)	* (6005.6)	* (3207.6)	(5576.9)	(26.67)	(8.290)	(7.541)	(3099.6)	(3840.2)
N	97	99	75	75	85	93	93	91	74	91	90	90	90	96	85	104	54

The table presents OLS regressions for the children's labor market and university relative beliefs and expectations on their observable characteristics. We use robust standard errors that are reported in parentheses and the stars indicate statistical significant to our usual levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. We also control for parents marital status missing in our regressions but do not report them in the table above because the quantity of young people in that category is sufficiently small. The reference category for our ethnicity variables is ethnicity missing.

Table 6 Pairwise Correlation between parent's subjective expectations.

Variable	Pr Degree 30	Pr Qualify	Pr Apply	Pr Apply With Sch	Pr Finish	Exp Earn 30 Degree	Exp Earn 45 Degree	Exp Earn 30 No Degree	Exp Earn 45 No Degree	Population Earn 30 Degree	Population Earn 30 No Degree	Pr Emp With Degree	Pr Emp No Degree	Exp Tuition	Exp Loans
Pr Degree 30	1.0000														
Pr Qualify	0.8169*	1.0000													
Pr Apply	0.7925*	0.5193*	1.0000												
Pr Apply With Sch	0.7094*	0.4827*	0.8164*	1.0000											
Pr Finish	0.4622*	0.5974*	0.5773*	0.5851*	1.0000										
Exp Earn 30 Degree	0.1761*	0.2472*	0.1627	0.0869	0.1041	1.0000									
Exp Earn 45 Degree	0.3002*	0.2787*	0.2599*	0.1908*	0.1577	0.7855*	1.0000								
Exp Earn 30 No Degree	0.0915	0.1713*	-0.0349	-0.0601	0.0423	0.5362*	0.3528*	1.0000							
Exp Earn 45 No Degree	0.1470	0.2146*	0.0008	-0.0048	0.0526	0.4791*	0.5211*	0.7734*	1.0000						
Population Earn 30 Degree	0.0389	0.0402	0.0075	-0.0473	-0.0508	0.5407*	0.4534*	0.4426*	0.3518*	1.0000					
Population Earn 30 No Degree	-0.1243	-0.0759	-0.1984*	-0.1967*	-0.0821	0.2503*	0.1396	0.4367*	0.4018*	0.5500*	1.0000				
Pr Emp With Degree	0.2868*	0.3688*	0.3227*	0.2028*	0.4563*	0.1680*	0.1979*	0.1657*	0.2194*	0.1656*	0.1309	1.0000			
Pr Emp No Degree	0.2261*	0.3198*	0.1408	0.0837	0.3661*	0.1246	0.1680*	0.3177*	0.3004*	0.2165*	0.1533	0.6881*	1.0000		
Expected Tuition	0.2172	0.2368	0.1800	0.2443*	0.2248	-0.0784	0.0312	-0.1551	-0.0747	-0.0730	0.0177	0.1608	0.1627	1.0000	
Expected Loans	0.2090	0.1195	0.1743	0.2444*	0.1756	-0.0646	0.1171	-0.1384	-0.0685	0.0117	0.0115	0.1639	0.1215	0.3818*	1.0000

Star indicates significance at the 1% level

Table 7. Child's expectations on their parents expectations and observed characteristics (OLS)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
	University Related Expectation				Earnings Expectations for Self		Earnings Beliefs For Population			Employment Exp for Self		Expected Cost	
	Chance Degree by 30	Pr Apply	Pr Apply With Scholarship	Pr Finish Uni	Expected Earnings With Degree	Expected Earnings With No Degree	Expected Earnings With Degree	Expected Earnings With No Degree	Logged Expected Returns	Pr of Emp With Degree	Pr of Emp With no Degree	Expected Tuition	Expected Loan
Fathers Beliefs	0.468***	0.413**	0.460**	0.121	0.228	0.614***	0.158	-0.0707	-0.00901	0.340*	0.187	0.290	0.215
	(0.136)	(0.194)	(0.208)	(0.157)	(0.192)	(0.223)	(0.261)	(0.249)	(0.182)	(0.183)	(0.197)	(0.251)	(1.01)
Mothers Beliefs	0.304***	0.412***	0.217*	0.377***	0.488***	0.342	-0.0838	0.169	-0.0463	0.116	-0.0104	0.0910	0.0286
	(0.112)	(0.133)	(0.124)	(0.112)	(0.183)	(0.272)	(0.161)	(0.121)	(0.188)	(0.137)	(0.135)	(0.205)	(0.18)
Male Child	7.680	2.226	-4.902	-1.144	1049.9	2282.1	-232.8	599.3	-0.350	2.129	8.376*	-173.2	-1275.3
	(7.030)	(7.676)	(7.457)	(4.347)	(3895.7)	(3491.0)	(2763.3)	(2012.1)	(0.383)	(3.214)	(4.765)	(1221.5)	(2095.6)
High Income	-2.183	-6.402	-6.140	-6.053	3631.6	2182.6	1107.8	-286.7	0.231	-4.898	-7.677	1599.8	-2005.7
	(7.347)	(8.008)	(7.922)	(4.383)	(4241.2)	(3654.9)	(2840.6)	(1983.0)	(0.394)	(3.527)	(4.938)	(1295.9)	(2302.1)
HH Degree	-4.156	-8.868	-11.30	-8.003	-6870.0	-5106.7	-1177.8	-104.3	-0.0918	-1.733	-2.050	-1607.1	-1719.7
	(8.063)	(8.471)	(8.359)	(4.957)	(4252.6)	(3791.4)	(2959.8)	(2083.4)	(0.402)	(3.757)	(5.173)	(1365.8)	(2520.2)
England	11.41	-17.62	-12.49	-1.916	6877.7	7845.8	-26.50	2641.8	0.667	-4.840	-16.02	3504.5	5391.7
	(17.68)	(29.75)	(29.26)	(12.40)	(9714.0)	(8732.3)	(6907.3)	(4771.1)	(1.002)	(10.05)	(11.94)	(3322.9)	(7487.0)
White British	57.93*	25.71	23.53	24.09*	28209.7**	-4016.7	-231.7	-6967.0	1.463	31.39***	19.43	2089.1	4668.6
	(31.75)	(21.88)	(21.54)	(13.82)	(13576.5)	(15263.1)	(11853.3)	(8296.6)	(1.445)	(11.12)	(14.77)	(4064.6)	(4800.0)
Ethnic Other	42.16	3.726	6.095	23.76	33960.8**	-3814.5	-1709.2	-8045.1	1.624	31.73***	19.15	-50.40	7121.2
	(32.44)	(23.16)	(22.53)	(14.31)	(14268.8)	(15729.2)	(12225.0)	(8543.1)	(1.542)	(11.63)	(15.52)	(4233.7)	(5209.0)
Constant	-44.99	28.77	46.45	61.12**	-21162.8	2965.7	30655.5**	18699.4**	5.996***	28.78	68.54**	-2846.7	-2895.2
	(40.02)	(37.89)	(38.30)	(23.80)	(20095.4)	(19740.1)	(12823.1)	(8199.2)	(1.173)	(27.55)	(28.17)	(4034.0)	(9813.1)
N	85	69	69	77	80	82	80	79	66	80	84	91	47

The table presents an OLS regression of Children's expectation on their fathers and mother expectations controlling for observable characteristics. The regression also includes dummy for mother/father not interviewed, and mother/father beliefs missing. We use robust Standard Error that are reported in parentheses* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Ethnicity missing is the reference category for our ethnicity variables.

Table 8 Parents Mean and SD of elicited population beliefs

		(1a)	(1b)	(2a)	(2b)	(3a)	(3b)
		Sample		Belief About Women		Belief About Men	
		(Actual – Belief)	Percent Error (Belief)/(Actual) * 100	(Actual - Belief)	Percent Error (Belief)/(Actual) * 100	(Actual - Belief)	Percent Error (Belief)/(Actual) * 100
With A degree	Mean	4.89	12.96	3.11***	9.20***	6.46	16.28
	(SD)	(8.52)	(23.27)	(8.74)	(25.85)	(8.03)	(20.24)
Absolute Value	Mean	7.96	21.52	7.17**	21.22	8.65	21.51
	(SD)	(5.75)	(15.66)	(5.85)	(17.32)	(5.59)	(15.66)
Without A	Mean	2.90	7.69	1.89**	5.60*	3.77	9.49
degree	(SD)	(6.86)	(18.41)	(6.14)	(18.16)	(7.34)	(18.49)
Absolute Value	Mean	5.68	15.33	5.07**	15.01	6.20	15.61
	(SD)	(4.82)	(12.74)	(3.92)	(11.59)	(5.43)	(13.69)
Returns to A	Mean	2.05	16.84	1.30	11.59	2.68	21.30
Degree	(SD)	(7.91)	(66.82)	(8.32)	(74.26)	(7.52)	(59.69)
Absolute Value	Mean	6.32	53.14	6.50	58.04*	6.17	49.00
	(SD)	(5.17)	(43.78)	(5.32)	(47.50)	(5.05)	(40.05)

Beliefs in 1a , 2a and 3a are all in £1,000's. The others are percentages. T-tests conducted for equality of means between columns 2a and 3a and 2b and 3b. ***,**,* indicate significance at the 1,5 and 10 % levels.

Table 9 Accuracy of Parents beliefs (actual – belief) on observable characteristics (OLS)

	(1)	(2)	(3)	(4)	(5)	(6)
	Parents Earnings Errors				Expected Returns Error	
	With Degree		No Degree			
		Absolute Value		Absolute Value		Absolute Value
Child Over 15	-817.5	-653.8	56.21	74.18	-1433.1	-136.9
	(1268.8)	(939.5)	(940.5)	(636.5)	(1007.3)	(696.6)
Parents Over 45	628.5	210.9	-3008.5***	244.4	3800.8***	624.8
	(1293.4)	(908.0)	(963.4)	(692.0)	(1022.8)	(686.8)
Male Child	2964.9***	1387.1*	1693.6*	1137.5**	1178.3	-116.7
	(1055.8)	(723.4)	(888.1)	(570.2)	(978.2)	(697.0)
Male Parent	-308.0	-576.4	671.7	-736.7	-1510.6*	-623.3
	(913.0)	(617.0)	(759.6)	(545.5)	(889.1)	(552.7)
HH Degree	-409.1	-1364.5	-1261.0	-2109.2***	1145.6	-1747.7**
	(1127.0)	(953.3)	(1004.6)	(655.6)	(1030.9)	(778.9)
HH High Income	-2676.5**	-1985.7**	-1771.3	-2237.1***	-772.9	-485.0
	(1341.6)	(988.3)	(1101.0)	(789.7)	(1021.5)	(773.9)
Married	2598.6*	1813.2	1528.5	1497.1*	1375.8	47.79
	(1433.2)	(1132.1)	(1139.7)	(835.1)	(1178.7)	(874.0)
White British	-2612.3**	-800.7	-1325.5	-1062.4	-653.9	568.6
	(1136.4)	(940.1)	(1031.6)	(748.1)	(1100.5)	(736.7)
Ethnic Other	-7124.4***	-621.5	-1852.6	803.2	-4902.8***	1093.7
	(2066.4)	(1178.9)	(1722.9)	(1242.6)	(1374.7)	(1205.4)
England	1010.3	1684.9*	1922.0	-4.300	-7.834	835.4
	(1380.8)	(922.1)	(1543.5)	(1095.8)	(1336.6)	(1088.8)
Constant	5240.9***	7501.3***	3461.2*	7365.5***	-4376.1**	7479.8***
	(1796.2)	(1270.4)	(1957.2)	(1291.2)	(2148.1)	(1694.5)
N	286	286	284	284	281	281

The table presents an OLS regression of the accuracy of parent's beliefs on observable characteristics. We include Ethnic Missing in our model. We do not report the coefficients in this table as the sample in these categories are sufficiently low. The standard errors are reported in parentheses and the stars indicate statistical significant to our usual levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors are clustered at the household level.

Table 10: relationship between parental wave 8 error (actual earnings – beliefs) and observable characteristics

	(1)	(2)	(3)
	Within 10% of the Actual Earnings+		
	With A Degree	With No Degree	Returns To A Degree
Child Over 15	0.0253	-0.0475	0.0211
	(0.0428)	(0.0548)	(0.0275)
Parents Over 45	-0.0247	0.0265	-0.0182
	(0.0409)	(0.0566)	(0.0324)
Male Child	0.0121	0.290***	0.0404
	(0.0412)	(0.0465)	(0.0273)
Male Parent	-0.0179	0.0270	-0.0346
	(0.0431)	(0.0470)	(0.0264)
HH Degree	-0.0822*	0.0921*	0.00943
	(0.0484)	(0.0552)	(0.0345)
HH High Income	0.0282	0.148***	0.0212
	(0.0494)	(0.0501)	(0.0333)
Married	0.0879	-0.0481	-0.0226
	(0.0540)	(0.0597)	(0.0401)
White British	-0.0165	0.147**	0.0386
	(0.0570)	(0.0666)	(0.0296)
Ethnic Other	-0.0451	0.0141	-0.00542
	(0.0743)	(0.0850)	(0.0436)
England	-0.0758	-0.0604	0.0713***
	(0.0664)	(0.0709)	(0.0212)
Constant	0.200**	-0.0786	-0.0508
	(0.0836)	(0.0844)	(0.0439)
N	286	284	281

The table presents an OLS regression of the probability of being accurate on observable characteristics. Standard errors in parentheses * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$, Standard Errors are clustered at the household level. Ethnicity Missing is the reference category for our ethnicity variables.

+ This means that the error in the parent's beliefs about population earnings is within 10% of the actual earnings. This is to account for the fact that boys typically earn more than girls and therefore a £3k error for boys is, proportionally, smaller, than a £3k error for girls.

Table 11 Parents Subjective Probability of applying to university and expected labour market returns (OLS)

	(1)	(2)	(3)
	Probability of Applying		
Earnings Returns Aged 30	1.236***		
	(0.416)		
Labor Market Returns age 30 of going to University		2.806**	
		(1.179)	
Employment Returns			0.241*
			(0.136)
Child Over 15	1.220	3.897	3.487
	(3.897)	(3.607)	(3.920)
Parent Over 45	1.838	4.150	1.593
	(3.934)	(3.619)	(3.984)
Male Child	-1.684	-0.717	-3.758
	(3.649)	(3.393)	(3.625)
Male Parent	-0.661	-5.545	0.495
	(3.772)	(3.491)	(3.819)
HH Degree	8.003*	4.171	8.974**
	(4.070)	(3.751)	(3.974)
Parents Married	5.825	2.679	1.544
	(4.671)	(4.326)	(4.454)
HH High Income	-2.292	1.899	1.893
	(4.199)	(3.954)	(4.057)
White British	-0.823	2.677	-1.819
	(4.944)	(4.476)	(4.938)
Ethnic Other	3.764	9.234	3.645
	(7.365)	(7.011)	(7.110)
England	-1.511	-3.700	-0.602
	(6.217)	(5.965)	(6.295)
Expected Tuition	0.0814	-0.162	-0.166
	(0.465)	(0.427)	(0.483)
Tuition Missing	-10.74*	-1.295	-13.50**
	(5.461)	(5.341)	(5.481)
Constant	68.88***	83.65***	78.40***
	(10.03)	(9.246)	(9.439)
N	226	204	240

The standard errors are reported in parentheses and the stars indicate statistical significant to our usual levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The expected tuition is reported in 1,000's and Ethnicity Missing is the reference category for our ethnicity variables.

Table 12 OLS, Child's University related application intentions on their own, and their parents, expected returns

	(1)	(2)	(3)	(4)	(5)	(6)
	Probability of Applying Without A Scholarship			Probability of Applying With A Scholarship		
	Labor Market Returns age 30 of going to University	Earnings Returns at age 30	Employment Returns	Labor Market Returns age 30 of going to University	Earnings Returns at age 30	Employment Returns
Child Returns	11.16***	24.27**	0.931***	8.180***	26.21**	0.700***
	(2.802)	(11.96)	(0.233)	(2.317)	(11.64)	(0.230)
Fathers Returns	-0.553	-22.66	0.0815	-1.708	-26.20*	0.0939
	(3.585)	(14.11)	(0.392)	(3.270)	(14.23)	(0.338)
Mothers Returns	0.706	23.78	0.459	0.884	16.19	0.236
	(3.461)	(16.22)	(0.290)	(3.324)	(14.85)	(0.259)
Male	-6.020	-2.195	-4.222	-12.40	-4.647	-7.845
	(9.933)	(9.851)	(9.762)	(9.250)	(9.010)	(8.539)
High Income	1.306	-1.151	-12.32	2.956	0.942	-10.02
	(11.80)	(11.63)	(10.75)	(10.89)	(10.47)	(10.39)
Household Degree	-1.652	9.021	-0.521	-8.290	4.208	-3.653
	(8.780)	(10.31)	(9.024)	(8.209)	(10.55)	(8.676)
England	-18.48	-28.28*	-46.74***	-9.285	-14.85	-36.02***
	(14.74)	(16.62)	(12.55)	(12.95)	(13.66)	(11.57)
British	30.80**	28.44**	23.30***	15.10	10.44	19.89*
	(14.11)	(11.44)	(8.114)	(14.17)	(10.51)	(11.21)
Ethnic Other	17.82	8.486	-2.158	9.463	-7.160	-0.405
	(20.86)	(20.37)	(15.58)	(19.03)	(19.31)	(17.83)
Child Expected Tuition	-1.33	-0.443	-0.761	0.0249	1.02	0.422
	(1.07)	(1.05)	(0.963)	(0.783)	(0.828)	(0.776)
constant	45.41	81.61**	114.9***	58.39*	85.10**	111.2***
	(35.41)	(37.13)	(28.49)	(30.01)	(33.10)	(27.70)
N	56	61	65	56	61	65

Regressions also include missing dummies for mother/father not interviewed, dummies for mother/father missing return, and missing dummies for tuition. The Child's Expected Tuition Fees are reported by 1,000 and Ethnicity Missing is the reference category for the ethnicity variables. The standard errors are reported in parentheses and the stars indicate statistical significant to our usual levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. We use robust standard errors.

Table 13a. Balance Table. Report the Wave 8 mean of the treatment and control groups by observable characteristics at the household level using our wave 8 (columns a - b) and wave 9 (columns c-f) samples. Columns c – d show the mean responses for the parents who we do not observe in wave 9. Columns e – f show the parents are interviewed for our module in wave 9

	(a)	(b)	(c)	(d)	(e)	(f)
By Observable Characteristics at the Household Level:	Interviewed in Wave 8		Not Interviewed in Wave 9		Interviewed in Wave 9	
	Control	Treatment	Control	Treatment	Control	Treatment
Child Over 15	.45	.52	.44	.48	.46	.57
Parent Over 45	.51	.46	.54*	.38	.54	.57
Child Male	.51	.54	.44	.49	.54	.56
Parent Male	.34	.31	.34	.26	.38	.44
HH Degree	.46**	.61	.48	.55	.48***	.70
High SES	.49	.51	.42	.48	.55	.60
Parent Married[+]	.59	.59	.56	.52	.66	.73
White British	.76	.68	.64	.65	.80	.70
Ethnic Other	.10	.12	.20	.22	.06	.13
England	.93*	.85	.16	.13	.94	.89
One Parent Respondent	.59	.54	.94**	.82	.52	.44
Max n (households)	104	121	39	58	65	63

Stars indicate significance as the following labels * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

[+]The national average was 68% in 2017 (ONS). This suggests that parents in our sample in wave 8 are less likely to be married than in the population.

Table 13b. Balance Tables. Report the Wave 8 mean of the treatment and control groups by the subjective expectations questions at the individual level using our wave 8 (columns a - b) and wave 9 (columns c-f) samples. Columns c – d show the mean responses for the parents who we do not observe in wave 9. Columns e – f show the parents are interviewed for our module in wave 9

Variable at the individual Level:	(a)	(b)	(c)	(d)	(e)	(f)
	Interviewed in Wave 8		Not Interviewed in Wave 9		Interviewed in Wave 9	
	Control	Treatment	Control	Treatment	Control	Treatment
Chance of a Degree by 30	69.6	66.8	72.5*	61.2	68.1	71.0
Chance Qualify for University	77.4	74.2	78.3*	68.2	76.9	78.9
Chance of Applying to University	77.6	76.4	77.1	69.3	77.9	81.3
Chance of Applying With Scholarship	82.0	82.8	79.6	78.2	83.0	85.9
Chance Finish University	90.4	89.0	90.1	87.5	90.5	90.0
Expected Earnings at 30 With Degree	32.5**	35.3	30.0	33.0	33.5*	37.0
Expected Earnings at 45 With Degree	43.4	46.0	36.4**	43.0	47.0	48.2
Expected Earnings at 30 No Degree	24.1	24.4	22.0	22.8	25.3	25.7
Expected Earnings at 45 No Degree	28.8	31.0	23.5*	27.3	31.5	33.7
Expected Earnings at 30 With Degree Population	32.4	31.7	33.6	31.7	31.8	31.7
Expected Earnings at 30 No Degree Population	21.8	22.4	21.2	21.8	22.1	22.8
Expected Returns to a Degree at 30 Population	10.3	9.6	12.3	10.4	9.3	9.0
Expected Returns to a Degree 30	8.8	10.6	9.0	10.1	8.8	11.0
Expected Returns to a Degree 45	14.8	15.1	13.1	15.2	15.6	15.0
Chance Employed With Degree	90.3	92.3	89.3	91.6	90.8	92.7
Chance Employed With No Degree	89.1	85.0	86.2	83.8	90.5*	86.0
Expected tuition	6.4**	7.6	4.4	3.9	3.7***	5.8
Expected Loans	6.6*	8.3	7.1	9.5	6.2	7.5
Max n (Individual)	147	177	50	77	97	100

Stars indicate significance as the following labels * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 14 OLS Treatment effect on the parent's accuracy about the distribution of earnings in wave 9.

	(1)	(2)	(3)
	Within 10% of the True Value		
	With A Degree	With No Degree	Returns to A Degree
Treatment	0.147***	-0.0185	0.0165
	(0.0509)	(0.0562)	(0.0428)
Accurate at Wave 8	0.110	0.134	0.00167
	(0.0755)	(0.0821)	(0.0770)
Child Over 15	-0.110*	-0.0314	-0.0158
	(0.0595)	(0.0531)	(0.0398)
Parents Over 45	-0.0111	-0.0347	0.0338
	(0.0627)	(0.0500)	(0.0416)
Male Child	-0.121**	0.232***	-0.0264
	(0.0491)	(0.0595)	(0.0402)
Male Parent	-0.0404	0.0301	-0.0429
	(0.0533)	(0.0585)	(0.0359)
HH Degree	-0.0697	0.110*	0.00590
	(0.0586)	(0.0620)	(0.0440)
HH High Income	0.0508	0.0133	0.0714
	(0.0571)	(0.0649)	(0.0476)
Married	0.0276	0.00731	-0.0876
	(0.0699)	(0.0788)	(0.0573)
White British	-0.00280	0.127*	-0.0136
	(0.0628)	(0.0658)	(0.0532)
Ethnic Other	0.103	-0.0585	0.00164
	(0.0990)	(0.0980)	(0.0781)
England	0.257***	0.0830	-0.0564
	(0.0500)	(0.0885)	(0.0732)
Constant	0.0852	-0.113	0.173
	(0.112)	(0.111)	(0.109)
N	235	232	229

The Standard Errors are reported in parentheses and the stars indicate statistical significant to our usual levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The Standard Errors are clustered at the household level.

Table 15 OLS Treatment on Wave 9 Errors (actual earnings – beliefs) in parents beliefs

	(1)	(2)	(3)	(4)
	Error in Parents Beliefs about Population earnings			
	With Degree		No Degree	
		Absolute Value		Absolute Value
Treatment	-1809.1	-1518.2**	708.9	-400.3
	(1131.5)	(741.6)	(1516.5)	(532.1)
Wave 8 Errors	0.175*	0.158*	0.349***	0.336***
	(1.93)	(0.0850)	(0.0939)	(0.0705)
Child Over 15	1879.8	1676.2*	-821.6	-440.2
	(1397.7)	(926.6)	(1445.4)	(605.8)
Parents Over 45	-158.3	-1046.6	-2015.1	-970.1
	(1364.7)	(850.6)	(1744.4)	(619.9)
Male Child	3705.5***	3365.8***	3236.8*	757.7
	(1259.7)	(764.4)	(1855.8)	(530.1)
Male Parent	-952.5	-482.1	-2973.0*	-908.2**
	(861.8)	(733.3)	(1609.5)	(406.4)
HH Degree	1025.5	438.3	-22.59	-739.1
	(1512.7)	(1005.1)	(1589.0)	(639.0)
HH High Income	-687.3	-7.857	2882.9	500.8
	(1237.0)	(808.8)	(2503.6)	(578.4)
Married	-2079.2	-1713.2	-2651.1	-519.4
	(1638.5)	(1063.1)	(2280.5)	(711.5)
White British	248.8	341.5	-1861.0	-1044.1
	(1491.6)	(1079.2)	(2008.1)	(740.6)
Ethnic Other	-770.5	142.2	-1975.9	-770.4
	(2158.8)	(1544.5)	(2270.4)	(948.3)
England	-2474.3	-2122.5**	-6204.1**	-1915.4*
	(1597.5)	(990.2)	(2706.9)	(989.3)
Constant	5775.0**	8368.6***	7520.0*	7229.3***
	(2598.9)	(1614.2)	(3979.3)	(1336.5)
N	235	235	142	232

The standard errors are reported in parentheses and the stars indicate statistical significant to our usual levels: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 16 Treatment effects on parental.

	Subsample analysis by observable characteristics								
	Change Degree by 30	Pr Apply to University	Pr Apply to University With Scholarship	Returns to a degree at 30 Population	Returns to a degree at 30 Own Child	Employment Returns to a Degree	Pr of Employment With a Degree	Pr of Employment Without a Degree	Expected Tuition
(a) All Parents	-0.805	1.958	1.781	2350.5**	875.2	-2.246	2.505	5.206	1205.2
	(3.236)	(3.928)	(3.998)	(1081.4)	(1685.1)	(3.067)	(2.980)	(3.203)	(875.6)
(b) Mothers	0.999	2.490	3.044	2627.9*	425.5	0.270	7.957*	7.048	812.2
	(4.484)	(5.868)	(6.123)	(1459.4)	(2416.4)	(3.664)	(4.571)	(4.267)	(824.2)
(c) Fathers	-1.925	2.103	2.431	2456.6	1327.2	-8.930	-6.759**	2.489	2855.6
	(4.588)	(5.982)	(4.876)	(1620.4)	(2694.9)	(5.680)	(3.168)	(4.236)	(2205.0)
	Interactions Using All Parents								
Treatment x:									
(d) Male Child	-3.017	-1.283	-2.619	-761.7	1115.4	-7.849	-12.52**	-2.212	757.5
	(5.995)	(7.112)	(7.354)	(1930.3)	(3141.6)	(5.614)	(5.248)	(5.389)	(1548.5)
(e) High SES	7.094	-9.456	-4.216	45.98	5186.9	2.615	0.138	0.580	-1792.4
	(7.097)	(8.383)	(9.241)	(2205.7)	(3270.9)	(5.598)	(5.803)	(6.265)	(1705.5)
(f) HH Degree	5.649	-7.894	2.111	-1833.4	65.26	8.511	-1.858	-7.224	-1415.3
	(7.547)	(8.258)	(9.533)	(2185.0)	(3372.3)	(5.678)	(6.477)	(6.364)	(1825.2)
(g) Wave 8 Accurate (within 10%)	-12.67	0.561	5.949	1938.2	-11569.9*	8.000	-6.857	-3.058	-3600.2
	(19.89)	(14.07)	(11.37)	(2884.6)	(6864.9)	(8.095)	(8.786)	(10.17)	(3519.2)
N	183	134	131	229	138	126	151	159	119

SE in parentheses, starts indicate significance as the following labels * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Rows d-g report the interaction by the treatment and observable characteristics.

Table 17. Treatment effects on parental and young people's expectations

	Young people	All Parents		
Dependent Variable:	(a) Regular OLS	(b) Regular OLS	(c) Regression Adjustment	(d) Propensity Score Matching
Change Degree by 30	2.309 (6.111)	-0.805 (3.236)	-0.716 (3.036)	-3.776 (4.330)
Probability Apply to University	-5.041 (10.47)	1.958 (3.928)	1.443 (3.740)	6.486** (2.904)
Probability Apply to University With Scholarship	-4.956 (7.633)	1.781 (3.998)	0.537 (4.007)	1.054 (2.932)
Returns to a degree at 30 Population	453.1 (2069.3)	2350.5** (1081.4)	2449.5** (1009.6)	2094.6** (961.7)
Returns to a degree at 30 Own Child	2792.8 (2716.1)	875.2 (1685.1)	792.0 (1532.2)	1605.7 (1554.3)
Employment Returns to a Degree	5.146 (5.051)	-2.246 (3.067)	-1.835 (3.062)	-0.985 (2.223)
Probability of Employment With a Degree	-3.102 (3.415)	2.505 (2.980)	3.200 (2.836)	2.236 (2.532)
Probability of Employment Without a Degree	-7.797 (5.706)	5.206 (3.203)	6.582** (3.236)	2.509 (3.131)
Expected Tuition	-3049.6 (2006.6)	1205.2 (875.6)	1016.2 (778.3)	1457.2* (778.4)
Max n	73	229	229	229

SE in parentheses, starts indicate significance as the following labels * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 18 OLS Treatment effect on the Children's accuracy of the distribution of earnings (OLS)

	(1)	(2)	(3)
	Within 10% of the True Value		
	With A Degree	With No Degree	Returns to A Degree
Treatment	0.0202	-0.00324	0.0551
	(0.0875)	(0.1000)	(0.0385)
Accurate at Wave 8	0.110	-0.0459	-0.122*
	(0.130)	(0.141)	(0.0676)
Male Child	0.107	0.352***	-0.0389
	(0.0930)	(0.106)	(0.0610)
HH High Income	-0.118	-0.0892	0.00428
	(0.124)	(0.130)	(0.0372)
HH Degree	0.000936	0.0620	0.130*
	(0.0989)	(0.126)	(0.0755)
England	-0.250	0.0375	0.0711
	(0.214)	(0.0995)	(0.0777)
Ethnic British	0.0251	-0.217	0.141
	(0.116)	(0.132)	(0.188)
Ethnic Other	-0.0367	-0.203	0.0831
	(0.192)	(0.180)	(0.202)
Parents Married	-0.00873	-0.00401	-0.0838
	(0.135)	(0.165)	(0.0764)
Parents Married Missing	-0.0970	-0.285	0.209
	(0.156)	(0.172)	(0.200)
Constant	0.319	0.0478	-0.196
	(0.259)	(0.180)	(0.257)
N	65	65	64

Standard errors in parentheses, starts indicate significance as the following labels * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
We use robust standard errors. Ethnicity Missing is our reference category for our ethnicity variables.

Appendix table A1. Difference in parent's belief in the employment rate and the actual employment rate

		(1a)	(1b)	(2a)	(2b)	(3a)	(3b)
		Sample		Belief About Women		Belief About Men	
		Belief Difference	Percent Error (Belief)/(Truth) * 100	Belief Difference	Percent Error (Belief)/(Truth) * 100	Belief Difference	Percent Error (Belief)/(Truth) * 100
With A degree	Mean	5.60	17.42	4.93	17.65	6.19	17.24
	(SD)	(14.80)	(17.41)	(13.82)	(16.08)	(15.64)	(18.46)
Absolute Value	Mean	8.94	17.42	8.50	17.65	9.34	17.24
	(SD)	(13.04)	(17.41)	(11.94)	(16.08)	(13.98)	(18.46)
Without A degree	Mean	5.64	26.00	4.18	23.94	6.93	27.54
	(SD)	(21.39)	(25.23)	(20.11)	(25.48)	(22.44)	(25.11)
Absolute Value	Mean	14.03	26.00	12.44	23.94	15.42	27.54
	(SD)	(17.09)	(25.23)	(16.31)	(25.48)	(17.68)	(25.11)
Returns to A Degree	Mean	3.22	69.31	2.08	52.03	4.23	84.60
	(SD)	(13.42)	(290.64)	(10.83)	(270.65)	(15.32)	(306.47)
Absolute Value	Mean	5.56	120.76	4.03 *	100.81	6.92	138.42
	(SD)	(12.63)	(272.68)	(10.26)	(256.39)	(14.30)	(286.07)

Beliefs in 1a , 2a and 3a are all in £10,000's. The others are percentages. T-tests conducted for equality of means between columns 2a and 3a and 2b and 3b. ***,**,* indicate significance at the 1,5 and 10 % levels.

A3 Table showing parents applications Intentions on their expected returns and observable characteristics by the child's sex (OLS subsample analysis)

	(1)	(2)	(3)	(4)	(5)	(6)
	Probability to Apply to University					
	Male Child			Female Child		
Earnings Returns Aged 30	1.767***			0.471		
	(0.539)			(0.710)		
Labor Market Returns age 30 of going to University		2.835*			2.655	
		(.433)			(2.284)	
Employment Returns			0.286*			0.240
			(0.171)			(0.251)
Child Over 15	-0.783	3.305	-1.004	5.758	7.701	9.360
	(5.373)	(5.025)	(5.614)	(5.963)	(5.714)	(5.974)
Parent Over 45	5.059	7.454	6.287	-0.0695	1.692	-0.480
	(5.584)	(5.239)	(5.839)	(5.906)	(5.539)	(5.916)
Male Parent	-7.596	-10.34**	-3.627	5.378	-0.0439	5.937
	(5.269)	(4.863)	(5.518)	(5.618)	(5.406)	(5.740)
HH Degree	6.167	4.075	9.862*	6.163	1.717	5.384
	(5.520)	(5.016)	(5.516)	(6.646)	(6.603)	(6.330)
Parents Married	13.40**	4.839	6.687	0.202	1.259	-5.007
	(6.394)	(6.038)	(6.018)	(7.399)	(6.812)	(7.240)
HH High Income	-8.236	0.768	-0.973	3.168	4.477	7.469
	(5.898)	(5.742)	(5.791)	(6.371)	(6.043)	(6.116)
White British	-6.359	-3.626	-8.67	13.016	16.57*	11.51
	(5.963)	(5.472)	(6.335)	(9.267)	(8.364)	(8.640)
Ethnic Other	11.45	9.311	1.790	7.02	17.31	9.817
	(10.68)	(9.661)	(9.88)	(12.05)	(11.92)	(11.63)
England	4.356	0.0278	-2.931	-9.407	-13.32	-0.692
	(8.855)	(8.729)	(9.545)	(9.640)	(9.548)	(9.431)
Expected Tuition	-0.0680	-0.549	-0.0984	0.114	0.0383	-0.0794
	(0.763)	(0.700)	(0.794)	(0.617)	(0.574)	(0.639)
Tuition Missing	-11.66	-0.00508	-13.55	-13.45*	-5.696	-12.23
	(8.578)	(8.573)	(8.965)	(7.627)	(7.568)	(7.732)
Constant	60.02***	76.32***	78.01***	72.52***	69.33***	62.14***
	(11.16)	(9.622)	(12.68)	(14.48)	(13.20)	(13.44)
N	120	110	130	106	94	110

The reference category for ethnicity is ethnicity missing. se in parentheses, starts indicate significance as the following labels * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Standard errors are clustered at the household level.

Figure 1 Parents Accuracy about the returns to a degree (actual returns – belief) we define error by subtracting their beliefs from the 'True Value', a positive (negative) error stipulates that the respondent underestimates (overestimates) population earnings.

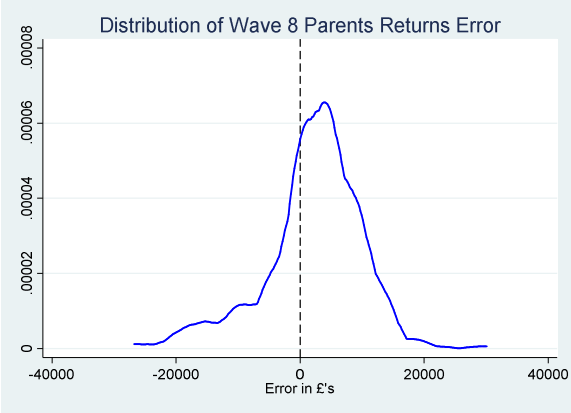


Figure 2 Parents Wave 9 Accuracy about the returns to a degree (actual returns – belief) we define error by subtracting their beliefs from the 'True Value', a positive (negative) error stipulates that the respondent underestimates (overestimates) population earnings.

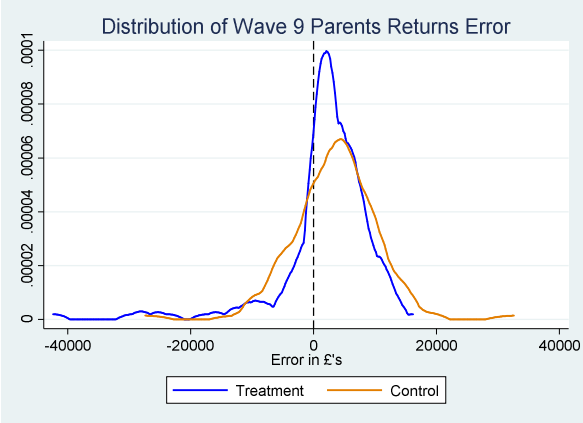


Figure 3 Parents Application intentions without a scholarship Wave 8 (LHS) and Wave 9 (RHS) by Treatment

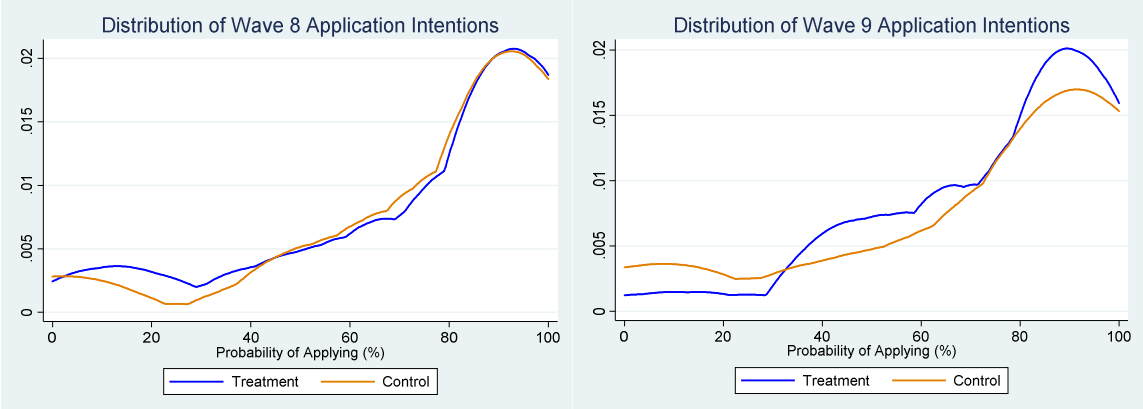
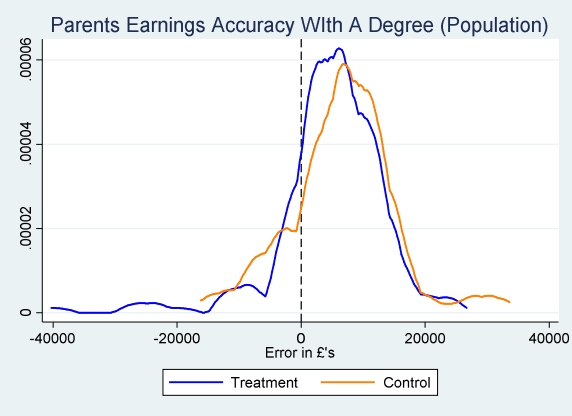
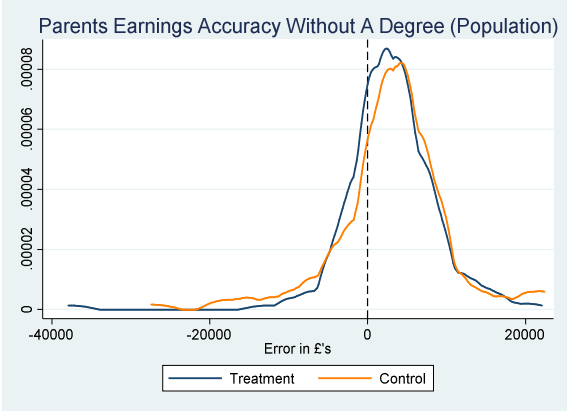


Figure 4 Parents Accuracy of Population earnings rescaled (actual earnings – belief) with (LHS) and without a degree (RHS) at 30.


Parents Earnings Accuracy WIth A Degree (Population)
0
.00002
.00004
.00006
-40000
-20000
0
20000
40000
Error in £'s
Treatment
Control


Parents Earnings Accuracy Without A Degree (Population)
0
.00002
.00004
.00006
.00008
-40000
-20000
0
20000
Error in £'s
Treatment
Control