



Data analysis

November 2017/31

The wellbeing of graduates

Assessing the contribution of higher education to graduates' wellbeing in the UK

This report investigates the effect of higher education on an individual's subjective wellbeing, as measured by four questions included in the Office for National Statistics' Annual Population Survey.

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HIGHER EDUCATION
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The wellbeing of graduates

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| To | Heads of HEFCE-funded higher education institutions |
| Of interest to those responsible for | Graduate employability and careers, equalities |
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Executive summary

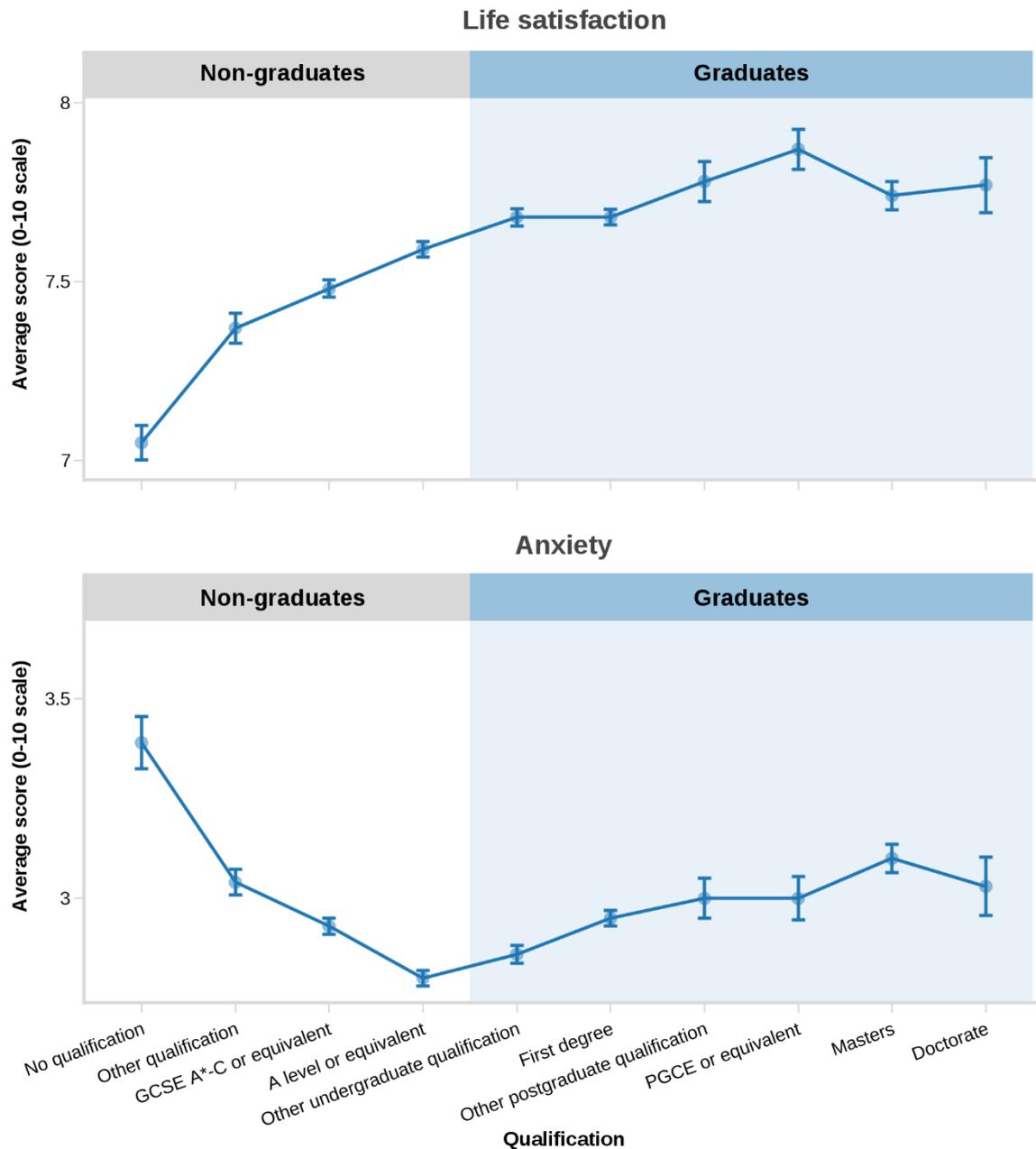
Background and purpose

1. Analyses of datasets, such as the Destinations of Leavers from Higher Education survey and Longitudinal Educational Outcomes data, provide a detailed understanding of graduates' labour market outcomes; however, graduates are likely to gain far more from higher education than just employment. **Higher education's effect on a graduate's life, from the graduate's perspective, can be captured by their assessment of their own wellbeing.** This report details the differences between the wellbeing of graduates and non-graduates, and identifies the groups for whom higher education has the greatest effect. It uses data from the ONS Annual Population Survey (APS), Special Licence Access April 2015 – March 2016.

Key points

2. **Graduates tend to be more satisfied with their lives** than non-graduates; however, **they also tend to be more anxious** across all income levels than people who have no qualifications above A-level. Graduates also tend to find their lives more worthwhile and be happier than non-graduates. The difference between the satisfaction and anxiety dimensions of wellbeing highlights the inadequacy of using a single measure to summarise graduates' wellbeing.
3. **There is also less variation in the wellbeing of graduates.** They are less likely than non-graduates to experience extremely low wellbeing, but also less likely to experience extremely high wellbeing.

Figure 1: Wellbeing across qualifications

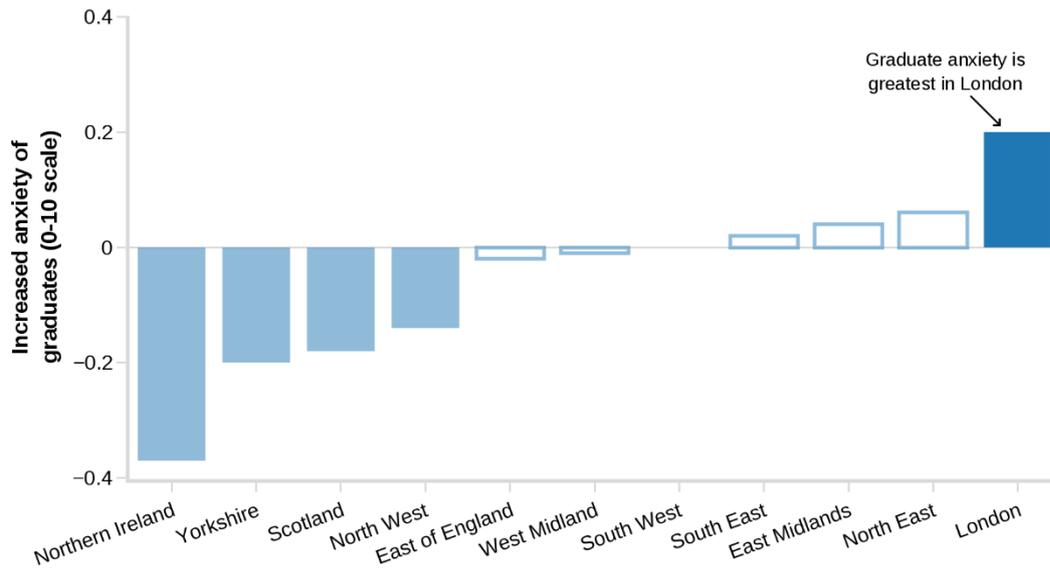


Note: Unweighted, mean group responses. Error bars denote the 95 per cent confidence interval of the mean.

4. The **increased anxiety of graduates is most prevalent in London**. In most other areas of the UK, graduates are both more satisfied and less anxious than non-graduates. It is unclear whether this is due to the location, the characteristics of the graduate population or their circumstances. For example, graduates who earn first class honours degrees are both significantly more anxious than lower-attaining graduates and also the most likely to move to London following graduation.

5. Within an occupation, graduates are rarely more satisfied, or more anxious, than non-graduates. **Access to particular occupations may explain a large part of the graduate wellbeing premium** and, since some occupations are concentrated in urban areas, may also go some way to explaining the regional effect. More research is required to establish the nature of these interactions.

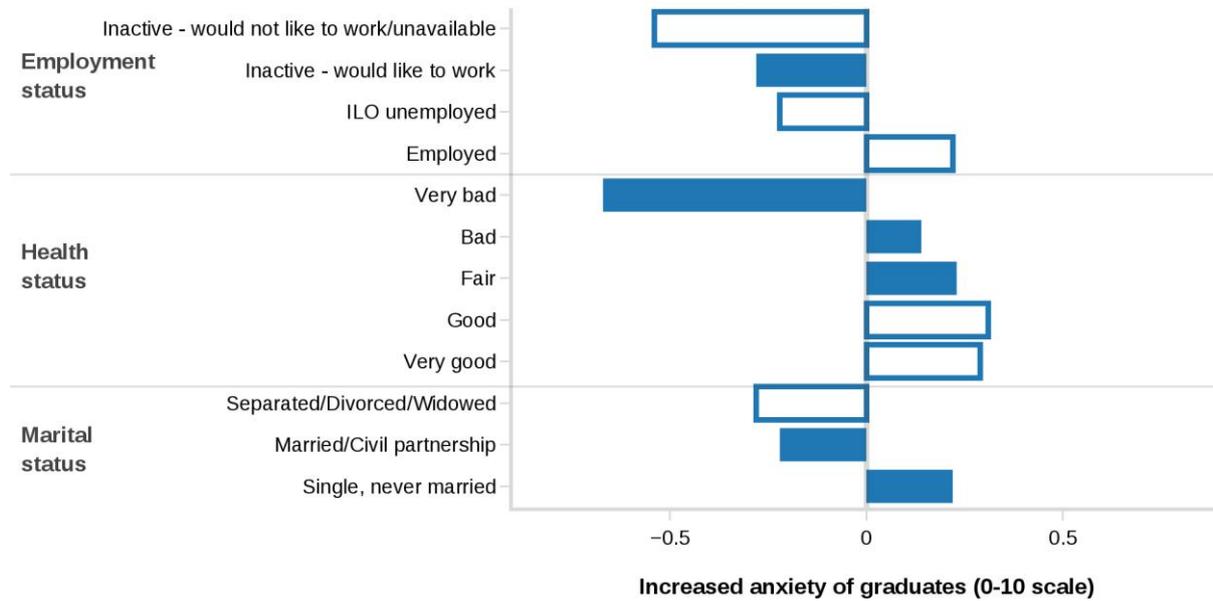
Figure 2: Anxiety across regions, relative to non-graduates



Note: Difference in mean anxiety scores between graduates and non-graduates. For anxiety scores, a lower score denotes lower level of anxiety. Filled in bars show that the difference is statistically significant to a 5 per cent significance level.

6. **Graduates are less affected by negative life circumstances than non-graduates.** The benefits of higher education are most conspicuous for people who are inactive in the labour market, separated, divorced or unmarried, or who have very poor health. For example, non-graduates who are not in the workforce are 11 per cent less satisfied with their lives than those who have jobs. However, for graduates, the difference is only 4 per cent. The findings are similar for anxiety: graduates with 'Very bad' health are 15 per cent less anxious than similar non-graduates.

Figure 3: Difference in anxiety between graduates and non-graduates



Note: Difference in mean anxiety scores between graduates and non-graduates. For the anxiety scores, a lower score indicates lower anxiety. Filled in bars show that the difference is statistically significant to a 5 per cent significance level.

Action required

- This document is for information only.

Introduction

1. The employment benefits of higher education are well understood; however, graduates are likely to gain more from their education than simply a good job¹. As Robert F Kennedy said in 1968, measures of wealth measure ‘everything... except that which makes life worthwhile’². Recent developments in the measurement of personal wellbeing allow us to capture the value of higher education to a graduate, from a graduate’s perspective. This report investigates the differences in wellbeing between graduates and non-graduates.

2. Scientists have sought to quantify human wellbeing and happiness since the 18th century when Sir John Sinclair, a founding member of the Royal Statistical Society, set out the aim of ‘ascertaining the quantum of happiness’ in his statistical account of Scotland³. However, it is not until recently that social scientists have had the tools to accurately quantify wellbeing.

3. The need for progress beyond income measurement was emphasised in the late 2000s by the European Commission’s ‘Beyond GDP’ conference and the subsequent establishment by the French government of the Commission on the Measurement of Economic Performance and Social Progress to identify the limitations of GDP as an indicator of social progress⁴. That was quickly followed in 2011 by the Organisation for Economic Co-operation and Development’s (OECD) ‘Better Life Initiative’, a global project to measure the wellbeing and progress of societies, and the New Zealand Treasury’s ‘Living Standards Framework’⁵. All of these projects emphasised the need for a dashboard of measures to assess living standards.

4. In the UK, the Office for National Statistics (ONS) founded the ‘Measuring National Well-being’ programme in 2010⁶. In addition to creating a dashboard of measures, it also led to HM Treasury updating its ‘Green Book’ to provide guidance on using wellbeing in cost-benefit analyses⁷. Questions about personal wellbeing are now embedded in many ONS surveys, which enable social scientists to begin investigating what conditions lead to greater wellbeing.

5. Numerous papers have attempted to estimate the effect that education has on personal wellbeing, but fewer have focused on higher education and fewer still have delved into the differences between people holding particular qualifications. There is work highlighting the poor wellbeing of students, but it often focuses solely on the period of study and does not extend to the time after graduation⁸. This report begins to fill that gap by examining in detail the differences in wellbeing between graduates and non-graduates in the UK. The aim is to better understand UK graduates’ wellbeing and guide the way for further research.

Prior research

6. Research to date on the value of higher education to graduates has largely focused on the labour market value of qualifications⁹. Wages and employment are important to graduates and permit relatively easy measurement. Research on non-monetary benefits has been less common and directed primarily at the health benefits associated with a higher education qualification¹⁰.

7. Wages, employment and health are instrumental: each contributes to a person’s capacity to live a life they have reason to value but is not itself a measure of a person’s prosperity. Surveying wellbeing directly enables researchers to measure the impact of these outcomes on a graduate, as valued by the graduate themselves.

8. The specific measures of wellbeing used in this report are often referred to as subjective, or personal, wellbeing. Subjective wellbeing is a person’s perception of the quality of their life. It

encompasses their emotional reactions to, and cognitive judgments of, their life. Measuring objective wellbeing provides a complementary approach, and refers to collecting information about a person's circumstances. Many measurement projects, such as the OECD's and ONS's, collect both subjective and objective data, and then investigate the effect that objective measures have on the subjective measure. That is the approach we take in this research.

9. The variation in individuals' subjective wellbeing can be accounted for by genetic and personality traits, and environmental factors. It has been estimated that up to 50 per cent of the variation can be explained by genes and personality¹¹. Using only measured personal characteristics and circumstances such as age, income, employment status, physical health and marital status, 10 to 19 per cent of the variation can be accounted for¹².

Direct effects

10. When considering the effect of education on wellbeing, one must consider the direct and indirect effects. **Indirect effects** occur when education directly causes something that, in turn, affects wellbeing. For example, if a person graduated with a degree that led them to earn more, and earning more made them more satisfied with their life, then education had an indirect effect on wellbeing via income.

11. **Direct effects** are the unmediated effects of education upon wellbeing. For example, higher education may improve a student's self-confidence and perception of self-efficacy, which may improve their satisfaction with their lives. The distinction between direct and indirect effects depends on what mediators are measured, but direct effects generally have no observable, intermediate outcomes.

12. Empirical researchers have attempted to separate the two and observe the mediating channels through which indirect effects act. In these settings, direct effects tend to be defined as the residual effect of education on wellbeing once other, observable outcomes have been accounted for. The difficulty of definition and measurement has led to contrasting findings across different model specifications: Gerdtham and Johannesson¹³ (GJ), and Blanchflower and Oswald¹⁴ (BO) observed the direct effect of higher education to be positive, whereas, Clark and Oswald¹⁵ (CO) found that, once the indirect effects of higher education are accounted for, the direct effect is negative.

13. There are many reasons why these results could differ. First, they are measuring different aspects of subjective wellbeing: CO measured job satisfaction, which differs from the life satisfaction used by BO and GJ, though the measures are correlated¹⁶. Secondly, the papers use different measures of education: BO use years of education and do not include specific variables for higher education. Thirdly, the independent variables differ between papers: BO do not control for health status, which is an important indirect channel for education and may bias the coefficient for education upward, relative to CO. Fourthly, the estimation approach differs between the papers: CO use panel data models, while GJ and BO use cross-sectional models that do not account for fixed effects. Finally, the papers use different datasets: GJ use Swedish data, BO use Eurobarometer data for the UK and CO use the British Household Panel Survey.

14. The sensitivity of the results to these differences highlights the difficulty of estimation. It also points to a need for specific investigation of higher education's effect within each local context, using locally relevant information.

Indirect effects

15. Powdthavee et al use the Household Income and Labour Dynamics in Australia survey to estimate the indirect effects of education¹⁷. They find that education increases satisfaction through many channels, the largest mediator being income, followed by long-term health, marriage and employment. The income effect has been further investigated in other work by Powdthavee et al¹⁸. Other authors have found improvements to wellbeing via reductions in unemployment¹⁹, improvements in health²⁰, and increases in the rate of marriage²¹. The employment effect appears to be greater for men than women²².

16. Importantly, not all of these channels are pecuniary or related to employment, which highlights the importance of measuring the wellbeing outcomes of higher education rather than relying solely on employment measures.

17. Little of the work cited above distinguishes between the effect of different levels of education – primary, secondary and tertiary – which makes it impossible to ascertain the mechanism through which higher education affects wellbeing. It may be that higher education works through different channels, or with different effect sizes, to school-level education. This report takes a step in that direction by isolating the wellbeing of higher education graduates.

Estimation techniques

18. A core problem with estimating the effect of higher education on wellbeing is that people have different ‘baseline’ levels of wellbeing. If people with higher wellbeing are more likely to go on to higher education then estimation of the effect of wellbeing is confounded by their selection into education. A common approach to dealing with this is to measure each person’s baseline level of wellbeing using longitudinal datasets that observe the same people multiple times over a fixed period, which allows their baseline to be extracted from the data. This is not possible with cross-sectional datasets that observe each person only once. The baseline level of individual wellbeing is often referred to as a ‘person-fixed’ effect because it remains constant over the period of the surveyⁱ.

19. Although longitudinal datasets allow for fixed effect models, the fixed effects of education can only be fully accounted for if the period of the survey captures respondents both before and after completing education²³.

20. The bias created by excluding person-fixed effects can be extremely high. When comparing the results obtained from both longitudinal and cross-sectional data, Winkelmann and Winkelmann found that using cross-sectional data doubled their estimated effect of health on wellbeing and halved the marriage effect, relative to a longitudinal estimate²⁴. This demonstrates how sensitive estimates are to the analysis technique, and the magnitude of the possible error if cross-sectional estimates were to be interpreted as causal.

21. Most of the studies cited above incorporate fixed effects for these reasons. However, the trade-off is that longitudinal studies tend to have far smaller sample sizes than cross-sectional surveys because of the difficulty of tracking people over time. The British Household Panel Survey is commonly used in the UK but has a sample size of only 9,090 compared to the cross-

ⁱ Person effects could also be accounted for using other models, such as random-effect models that assume a distribution of baseline wellbeing across the sample.

sectional Annual Population Survey's approximately 300,000 respondents annually. The limited sample size is the main reason that prior research has not delved in to the details of graduate wellbeing: there are simply too few graduates in the sample to reliably split the sample further to examine, for example, differences in the type of higher education qualification.

Method

Approach

22. This report uses cross-sectional data to enable the differences in wellbeing between graduates and non-graduates to be decomposed by other personal characteristics. The drawback of using cross-sectional data is that the findings cannot be interpreted as causal estimates: they are simply raw population differences. However, the decompositions highlight areas that may prove fruitful for future statistical modelling. The aim of this report is to better understand UK graduates' wellbeing and guide further research.

23. There are two parts to the results: in the first, we compare wellbeing across qualification levels to identify the differences in wellbeing between, for example, those with GCSEs as their highest qualification and those with a masters degree. For those graduates where it is applicable, we also consider the degree classification obtained and the subject studied.

24. The second part compares the wellbeing of graduates and non-graduates within sub-groups defined by their demographic characteristics. The characteristics explored are those that have been shown to affect either wellbeing or students' outcomes²⁵:

- employment status
- earned income
- occupation
- self-assessed health status
- ethnicity
- age
- region
- marital status.

25. Graduates' and non-graduates' mean scores for each wellbeing question are compared for each group. For example, respondents are split by the characteristic of marital status and then the mean scores of all married graduates are compared with the mean scores of all married non-graduates. We have tested and reported whether the difference in group mean scores is significantly different from zero at a 95 per cent confidence level using a two-tailed student's t-test.

Data

26. Our dataset is the ONS Annual Population Survey (APS), Special Licence Access April 2015 – March 2016. The APS is a cross-sectional dataset covering UK residents and has a sample size of over 303,645 in this year, which allows for detailed disaggregation across personal characteristics, including levels of education. We can highlight potentially important differences between the wellbeing of graduates and non-graduates using simple comparisons of groups' mean wellbeing.

27. All groups in the results are weighted using the ONS' non-proxy person weightings, unless otherwise stated. These ensure the respondents' age, sex and region of residence are representative of the UK population.

28. The APS contains four wellbeing questions, each of which measures one dimension of a respondent's subjective wellbeing. Respondents are asked to answer the following questions on a scale of 0 to 10, where 0 means 'not at all' and 10 means 'completely':

- a. 'Overall, how **satisfied** with your life are you nowadays?'
- b. 'Overall, to what extent do you feel the things you do in your life are **worthwhile**?'
- c. 'How **happy** did you feel yesterday?'
- d. 'How **anxious** did you feel yesterday?'

29. The **satisfaction** question provides a life evaluation; this is regularly used on its own to measure subjective wellbeing. It is the result of a cognitive evaluation of the respondent's life and not a description of their current emotional state.

30. The **happiness** and **anxiety** questions are positive and negative affect questions, which are measures of emotional states or feelings. The reason the respondent is asked about yesterday is that people accurately remember only their recent emotions.

31. The **worthwhileness** question encompasses emotional attributes such as a sense of purpose, or meaning, in life. For example, if a respondent volunteers, or has children, this could result in an increase in their worthwhileness score.

Sample construction

32. Not all respondents to the APS are suitable for inclusion in this analysis so we restrict the sample in several ways. The APS is a household survey with interviews conducted either face-to-face or on the phone and 131,600 respondents were 'personal responders', which means they were personally interviewed. There are other respondents whose data is obtained through proxy interviews or from a previous edition of the survey. These respondents are not asked the wellbeing questions and are excluded from our sample.

33. Additionally some respondents do not answer one or more wellbeing questions despite being personal responders. These have also been excluded, leaving 130,165 personal responders who answered all four wellbeing questions.

34. Many of the characteristics considered in this report are closely related to employment, so any respondents not of working age (16 to 64) have been excluded. Moreover, as a high proportion of the young respondents are in full-time education at the time of the survey, the sample has been further restricted to 22 to 64 year olds in order to exclude the majority of students in full-time education. This leaves 107,530 respondents in our analysis sample.

Table 1: Characteristics of our analysis sample

| Variable | Number of responses | Mean | Standard deviation | Lower quartile | Median | Upper quartile |
|------------------------------|---------------------|---------|--------------------|----------------|---------|----------------|
| Satisfaction | 107,530 | 7.5 | 1.8 | 7.0 | 8.0 | 9.0 |
| Worthwhileness | 107,530 | 7.8 | 1.7 | 7.0 | 8.0 | 9.0 |
| Happiness | 107,530 | 7.4 | 2.1 | 6.0 | 8.0 | 9.0 |
| Anxiety | 107,530 | 3.0 | 2.9 | 0.0 | 2.0 | 5.0 |
| Age | 107,530 | 45.4 | 11.7 | 36.0 | 46.0 | 55.0 |
| Gross, annual, earned income | 57,495 | £26,900 | £37,500 | £13,300 | £22,000 | £34,000 |

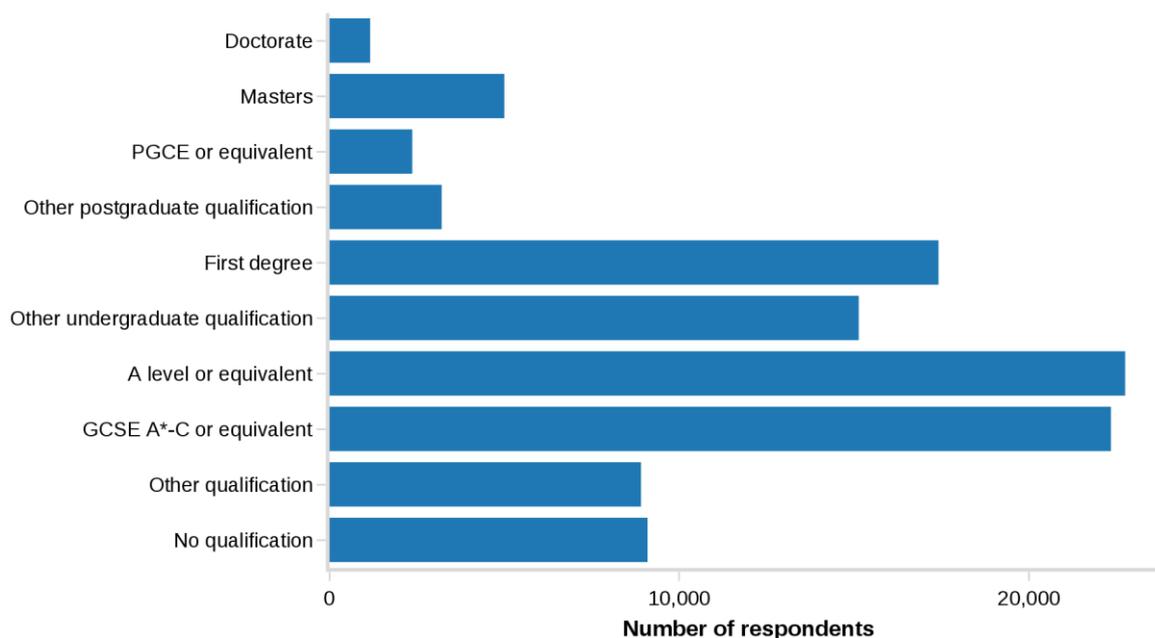
Note: Wellbeing scores and age have been rounded to one decimal point. Headcounts are rounded to the nearest five and earnings are rounded to the nearest £100. Only continuous variables used in later analysis are included.

Higher education qualifications

35. Graduates in the sample have a wide range of higher education qualifications, from Level 4 qualifications such as Higher National Certificates through to doctoral degrees. Some of these qualifications may have been awarded up to 40 years ago, so it is not possible to comprehensively match respondents' qualifications to current definitions of higher education. As far as possible, we have sought to follow Ofqual's Regulated Qualifications Framework and defined higher education as any qualification at Level 4 or above. This is also consistent with the definition in the Higher Education and Research Act 2017²⁶. Details of the classification used are provided in Annex A.

36. Respondents with qualifications from overseas have been excluded from our sample because it is not possible to match their qualifications to UK qualification frameworks using the available data.

Figure 4: Distribution of respondents' qualifications



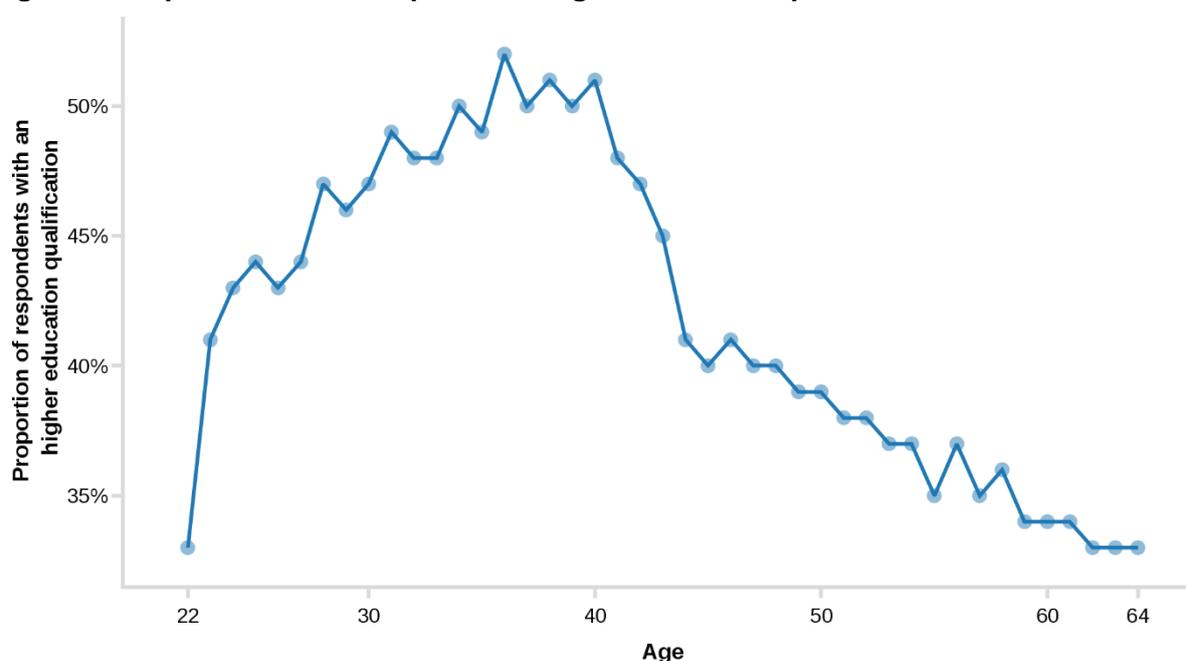
Note: Frequency of unweighted responses.

Limitations

37. Using a cross-sectional dataset presents specific problems for interpretation of differences between groups. First, as the respondents discussed in this report are between 22 and 64 years of age, older respondents may have completed their education over 40 years ago. The higher education system and the labour market for graduates were quite different in 1975: far fewer people attended higher education (see Figure 5) and far fewer jobs required it.

38. Consequently, some of our findings may not be directly applicable to current and recent graduates. For example, some professions historically have not required a degree, such as nursing, but more recently have had this requirement introduced. In our sample, fewer than half of nurses over 40 have a degree or equivalent qualification. If being a nurse influences a respondent's wellbeing, and they are young enough to have required a degree to become a nurse, then part of the effect on their wellbeing would be an indirect effect of higher education. This indirect effect of higher education would not be seen in an older respondent.

Figure 5: Proportion of the sample with a higher education qualification



Note: Proportion of respondents within a one-year age group who report holding a higher education qualification. Unweighted responses.

39. Secondly, around half the respondents in the APS have no earnings data available, which limits the sample size for comparisons involving income to 57,495 respondents. Even among respondents identified as being in employment, around a quarter of them do not provide earnings data. In addition, the APS collects only the earned income of the respondents, which does not include unearned income sources such as inheritance or benefits. Consequently, the earnings data may not accurately represent the total income of the respondents.

40. The ONS' Labour Force Survey, which draws from the same sources as the APS, includes income weightings to account for these problems with the sampling of income. Unfortunately, they are not available for APS. To minimise the impact on our findings as far as possible, we have followed the ONS' guidance and reported median incomes, rather than mean incomes.

Results

Differences in wellbeing across qualifications

41. Table 2 illustrates the differences between graduates' and non-graduates' wellbeing. The summary statistics show that graduates are happier, more satisfied with their lives, find their lives more worthwhile and are no more anxious than non-graduates.

42. The table also shows that the standard deviation of graduates' responses is lower than non-graduates'. That indicates graduates are less likely than non-graduates to experience very low levels of wellbeing, but also less likely to experience extremely high levels of wellbeing. These statistics are confirmed by inspection of the distributions of wellbeing (see Figure 6).

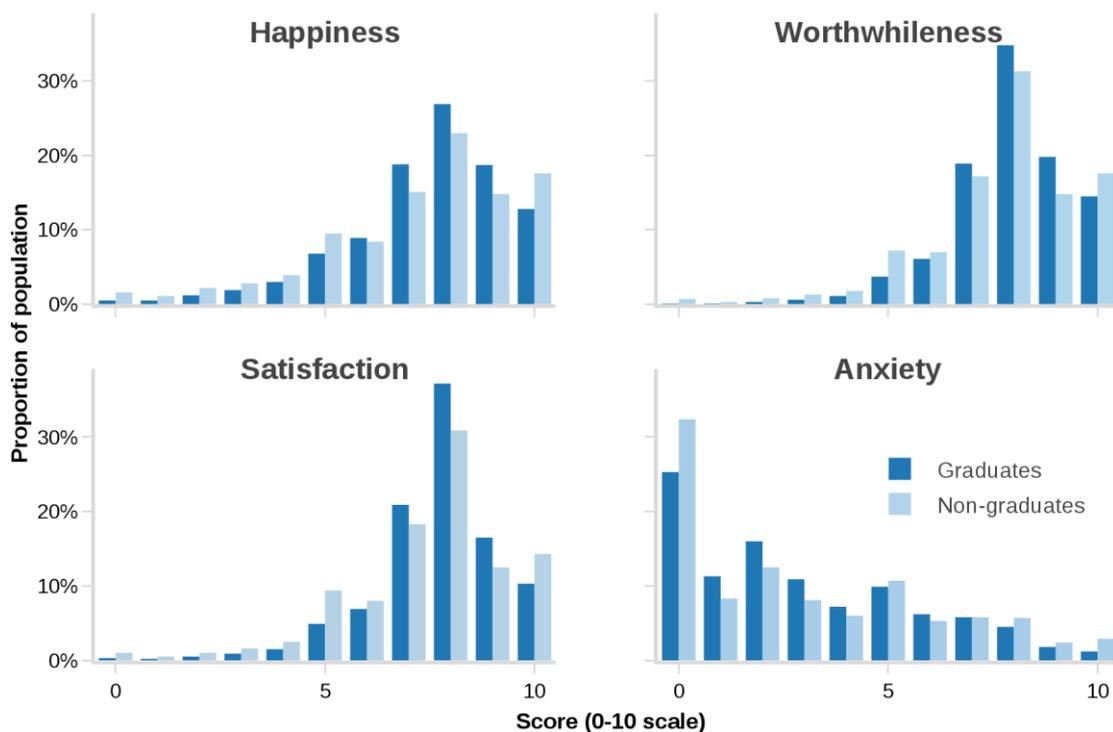
Table 2: Unconditional difference in wellbeing

| | Graduates | | Non-graduates | |
|----------------|-----------|--------------------|---------------|--------------------|
| | Mean | Standard deviation | Mean | Standard deviation |
| Satisfaction | 7.7 | 1.5 | 7.4 | 1.9 |
| Worthwhileness | 8.0 | 1.5 | 7.7 | 1.8 |
| Happiness | 7.5 | 1.9 | 7.3 | 2.3 |
| Anxiety | 3.0 | 2.7 | 3.0 | 3.0 |

Note: Mean and standard deviation refer to points on the 0-10 scale used by ONS are rounded to one decimal point (0 means 'not at all' and 10 means 'completely'). Responses are unweighted. There are 44,330 graduates and 63,200 non-graduates in the sample.

43. The happiness and anxiety questions have a greater variance than satisfaction and worthwhileness, which is to be expected: feelings about yesterday's emotions are more variable than life evaluations.

Figure 6: Distribution of responses to wellbeing questions

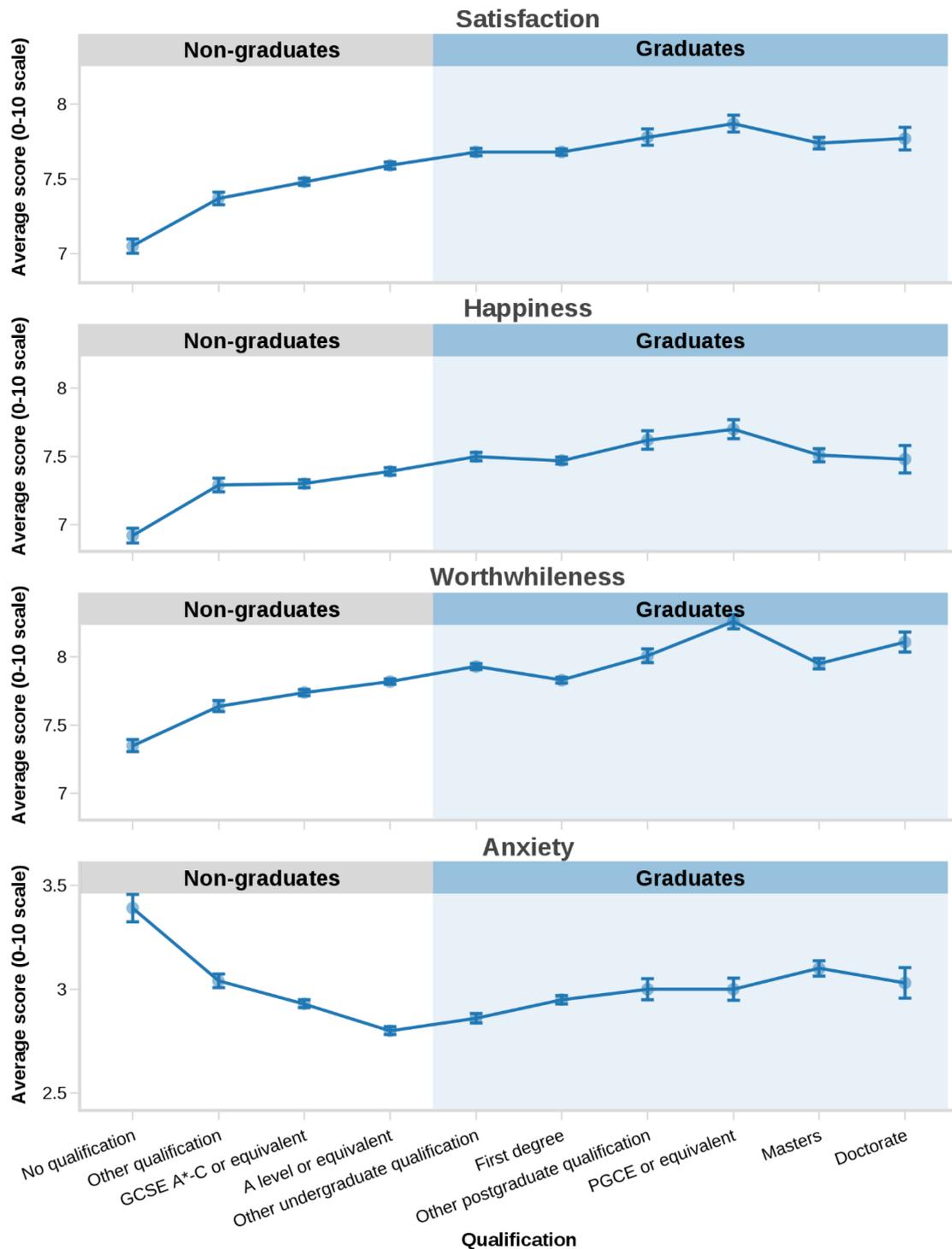


Note: 'Proportion of population' means the percentage of respondents providing a response to each question. Unweighted responses.

44. Figure 7 reveals that, while people with higher education qualifications have greater wellbeing, they are not always less anxious. Relative to people who have only an A-level qualification, graduates have greater positive wellbeing but are more anxious. Note that the lower

the anxiety score, the less anxious the respondent is: a low anxiety score indicates greater wellbeing.

Figure 7: Wellbeing across qualifications



Note: Unweighted, mean group responses. Error bars denote the 95 per cent confidence interval of the mean.

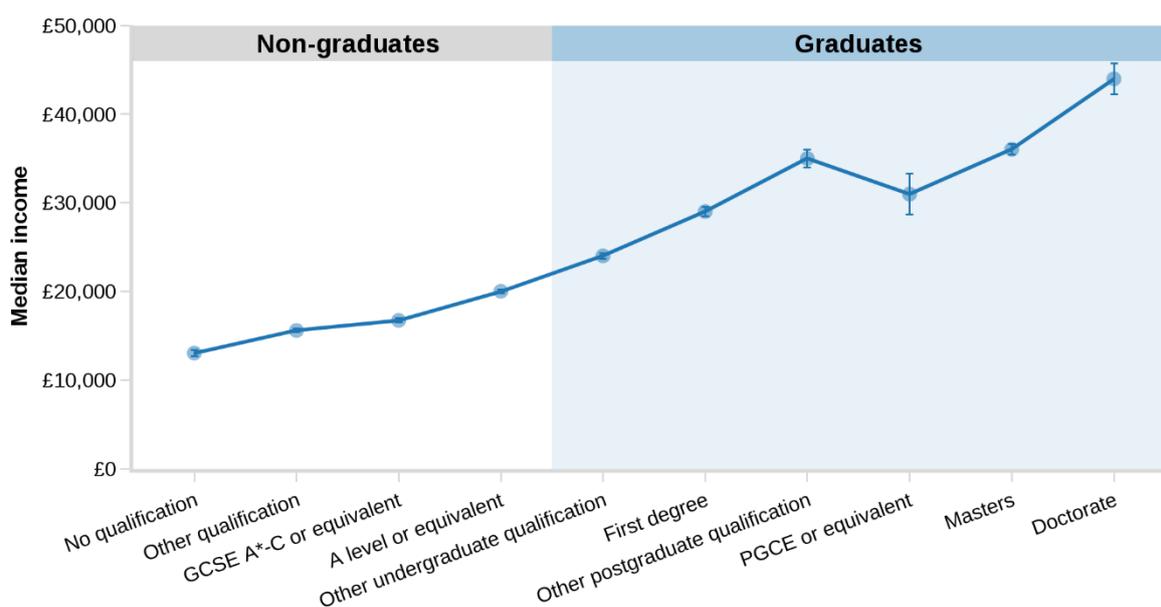
45. Notably, graduates with postgraduate qualifications gain very little in the way of life satisfaction or happiness, relative to graduates with only a first degree, but they do tend to find their lives more worthwhile.

46. Figure 7 shows that increasing levels of qualifications appear to have a diminishing effect on wellbeing: each additional qualification adds a little less to the wellbeing score than the previous qualification. That contrasts with the effect of additional qualifications on income, which does not diminish across groups (see Figure 8).

47. The difference between Figures 7 and 8 suggests that measuring solely income effects may be insufficient to understand the value of higher education to an individual²⁷. That is particularly the case for graduates who hold a PGCE: they have the lowest average earnings of any postgraduates but the greatest positive wellbeing.

48. Figure 7 also suggests that, while the positive wellbeing questions are highly correlated across qualifications, responses to the anxiety question differ. That means a person who is happy will also usually find their life worthwhile and satisfying; however, they may also be quite anxious. Throughout the report, we take advantage of this to report wellbeing across the dimensions of life satisfaction and anxiety. Where the results for happiness or worthwhileness differ from the results for life satisfaction, they are also reported.

Figure 8: Income across qualifications



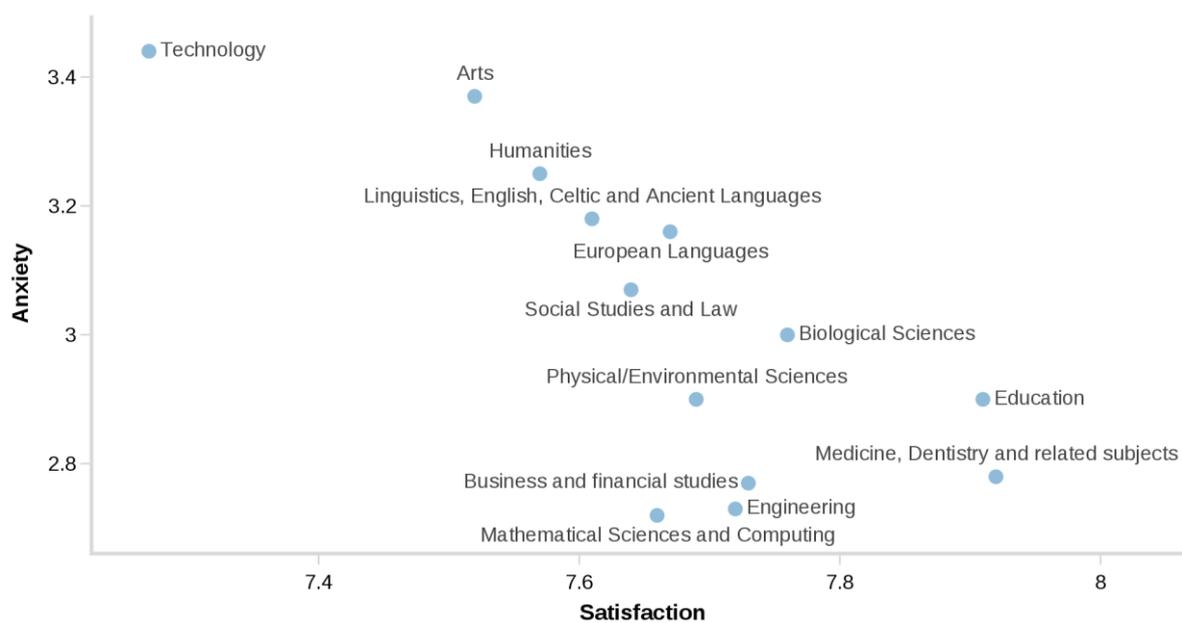
Note: Unweighted, median group responses. Error bars denote the 95 per cent confidence interval.

Undergraduate subject

49. The wellbeing of graduates varies markedly depending on the subject studied. Figure 9 shows that respondents who studied education or medicine at undergraduate level have high life satisfaction and low anxiety scores. It is not possible to say that this is a causal relationship, but both subjects are highly vocational and can lead to reliable employment and, often in the case of medicine, high earnings²⁸. They are also subjects leading to careers that enable graduates to help others, which has been found to be lead to high life satisfaction²⁹.

50. Arts graduates have the highest anxiety and lowest life satisfaction scores. This, again, could be related to employment or earnings prospects, since arts graduates tend to have poor earnings compared to other graduates³⁰.

Figure 9: Wellbeing by undergraduate subject



Note: Mean wellbeing scores within first degree subject studied.

Undergraduate attainment

51. Graduates who attained a higher degree classification at undergraduate level tend to have greater positive wellbeing than their lower-attaining counterparts. However, as Figure 10 shows, they are also more anxious, which suggests that high-attaining graduates may not have unambiguously greater wellbeing.

Figure 10: Wellbeing by degree classification



Note: Difference in mean wellbeing scores, split by respondents' first degree classification (base group is a third). A positive value denotes a higher score for the classification displayed. For the anxiety scores, a lower score is 'better'. Filled in bars show that the difference is statistically significant to a 5 per cent significance level.

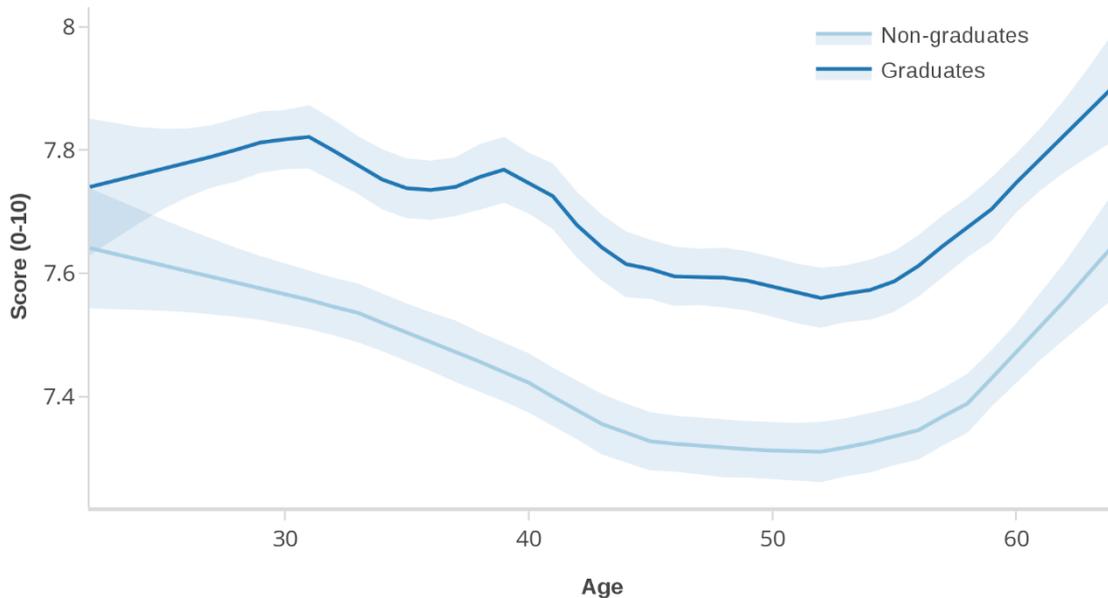
Differences in wellbeing across personal characteristics

Age

52. Most subjective wellbeing literature has observed a U-shaped relationship between age and satisfaction³¹. Our sample also exhibits this pattern: the young and old have the highest levels of satisfaction, and the lowest point for both graduates and non-graduates is at the age of 52 (see Figure 11).

53. On average, graduates have a satisfaction score 0.2 points higher than the non-graduates. However, Figure 11 shows that there is little difference between young respondents, 22 to 26, many of whom will still be in education or recently graduated. After that early period, the gap remains stable throughout their working life.

Figure 11: Life satisfaction across ages



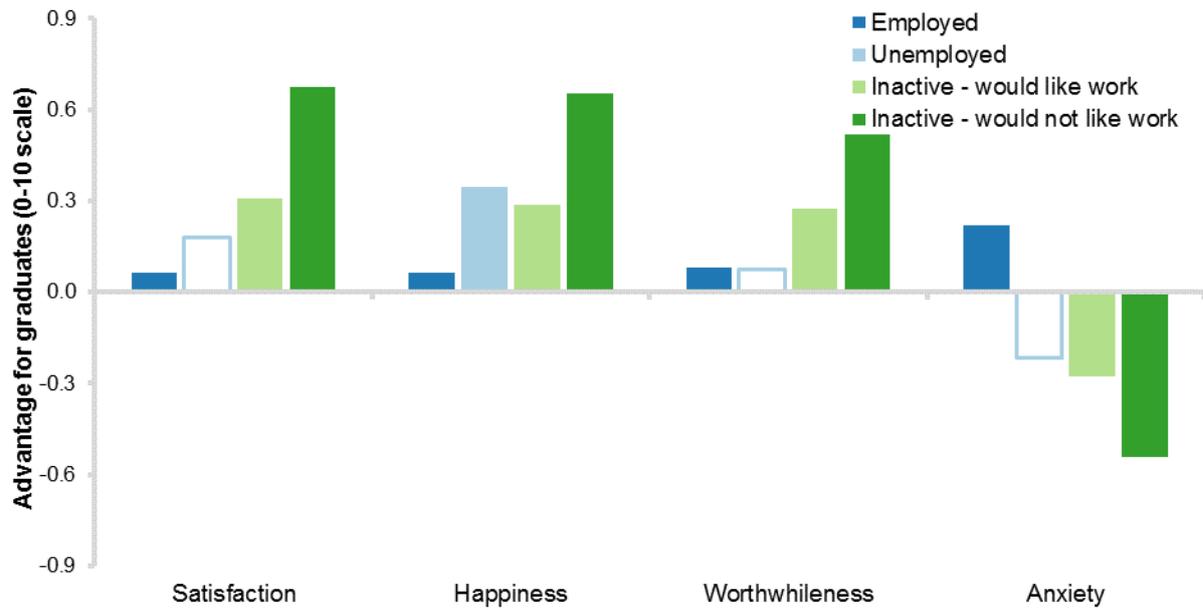
Note: Lines were generated by fitting a Lowess model to individual responses. Shading denotes the 95 per cent confidence interval of the Lowess estimate.

Employment status

54. Employment status is one of the main channels through which education improves subjective wellbeing³². Graduates have higher employment rates than non-graduates and, through the 2008-09 recession, graduates' employment rates fell less than non-graduates³³.

55. Not only are graduates more likely to be employed but Figure 12 shows that graduates who are unemployed or inactive have greater wellbeing on every dimension than non-graduates. They are happier, less anxious, more satisfied with their lives and find their lives more worthwhile. Essentially, the wellbeing cost of unemployment is lower for graduates than for non-graduates.

Figure 12: Difference in wellbeing by employment status

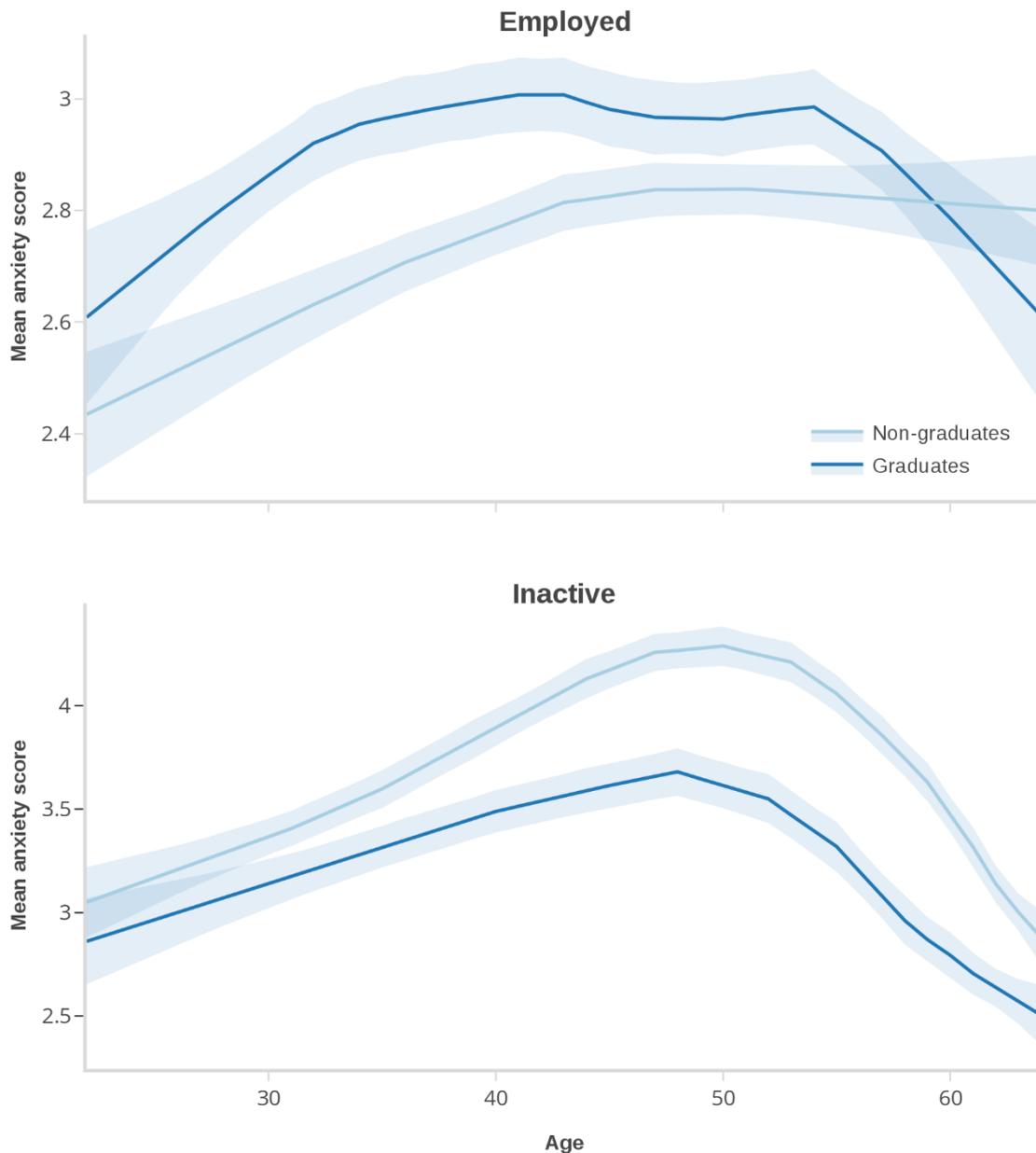


Note: Difference in mean wellbeing scores between graduates and non-graduates. For the anxiety scores, a lower score is 'better'. Filled in bars show that the difference is statistically significant to a 5 per cent significance level.

56. The effect of employment on wellbeing varies markedly across ages. Among the employed, the anxiety of graduates is constant from the age of 30 through to 60. However, non-graduates' anxiety rises gradually over their lifetime to match that of graduates by the age of 60.

57. These patterns imply that graduates are cushioned against the wellbeing cost of unemployment later in their lives, when the cost is greatest. However, they also experience greater anxiety in the formative years of their career, through their 20s and 30s.

Figure 13: Anxiety across ages by employment status



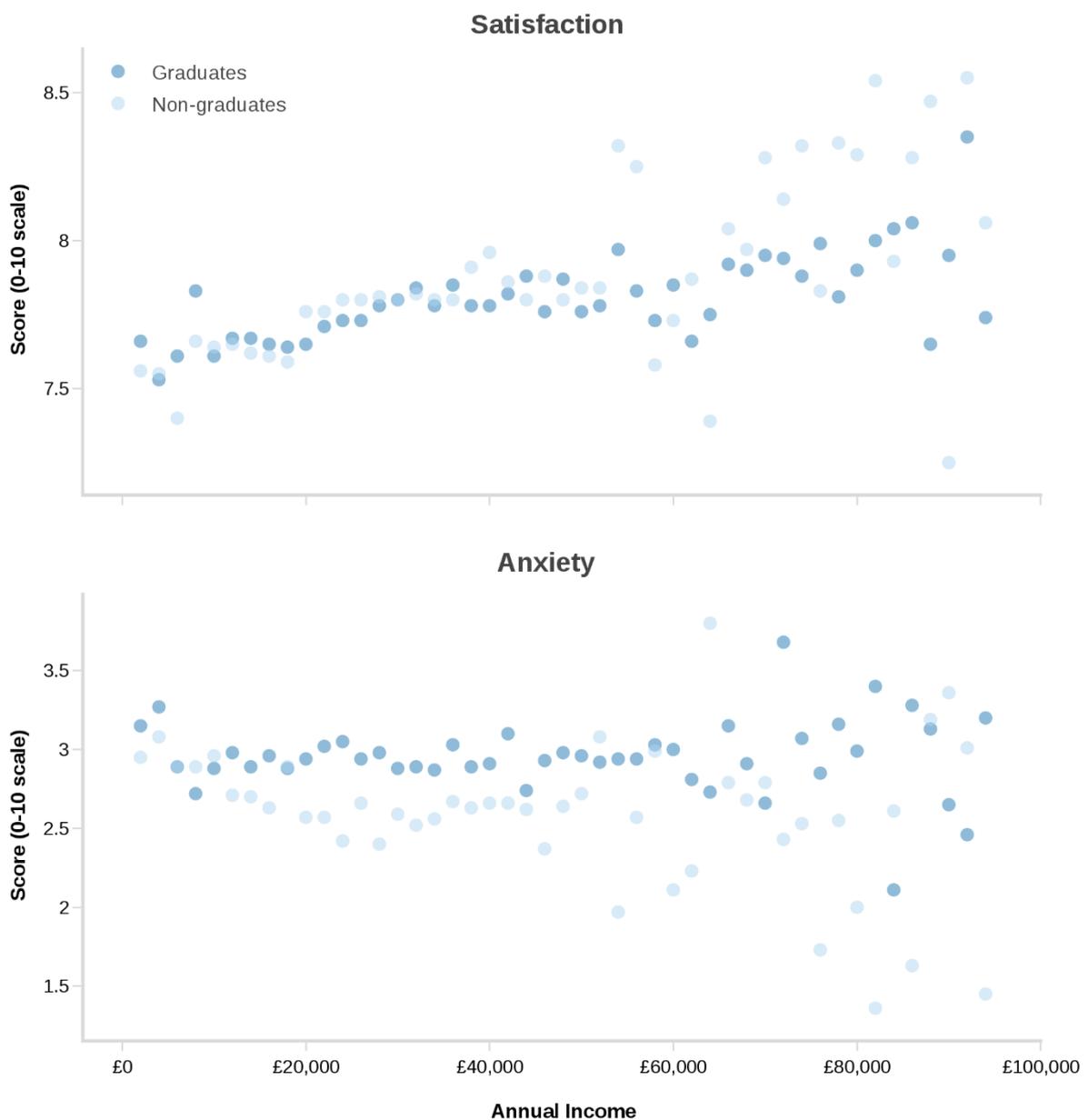
Note: Lines were generated by fitting a Lowess model to individual responses. Shading denotes the 95 per cent confidence interval of the Lowess estimate. Employment status is based on ILO definitions.

58. Note that it is impossible to disentangle cohort effects from age effects in this cross-sectional data. The observed patterns are described above as being related to age, but they may equally be related to the year of birth.

Income

59. Income is an important channel through which education indirectly improves wellbeing. Wellbeing tends to rise with income and, as education tends to increase income, education indirectly improves wellbeing³⁴. The ONS' work has shown that the APS data is consistent with these findings, and our analysis has confirmed that³⁵.

Figure 14: Life satisfaction across income levels



Note: Only employees with known earnings data are shown on these figures. Earnings have been grouped to ensure larger group sizes and the mean wellbeing of the group is displayed on the chart.

60. One additional finding in Figure 14 is that, for a given level of income, there is very little difference in positive wellbeing between graduates and non-graduates. That means, for a graduate and a non-graduate who earn the same amount, there is a negligible difference in their expected level of wellbeing. It is consistent with the statement that graduates have higher wellbeing than non-graduates because graduates are more likely to have higher income.

61. This finding implies that differences in income may account for much of the difference in graduate and non-graduate wellbeing. More research would be required to establish this finding since our analysis ignores many other factors, such as age, cohort, occupation and family status, all of which affect both income and wellbeing; however, it is consistent with some of the longitudinal work cited above that does attempt to account for these factors and finds limited indirect effects of higher education³⁶.

62. A second notable feature of Figure 14 is that graduates appear to be more anxious than non-graduates across the income range. This highlights the multi-dimensional nature of wellbeing and the dangers associated with reducing it to a single measure. Since income tends to rise with age, this is consistent with the result in Figure 13.

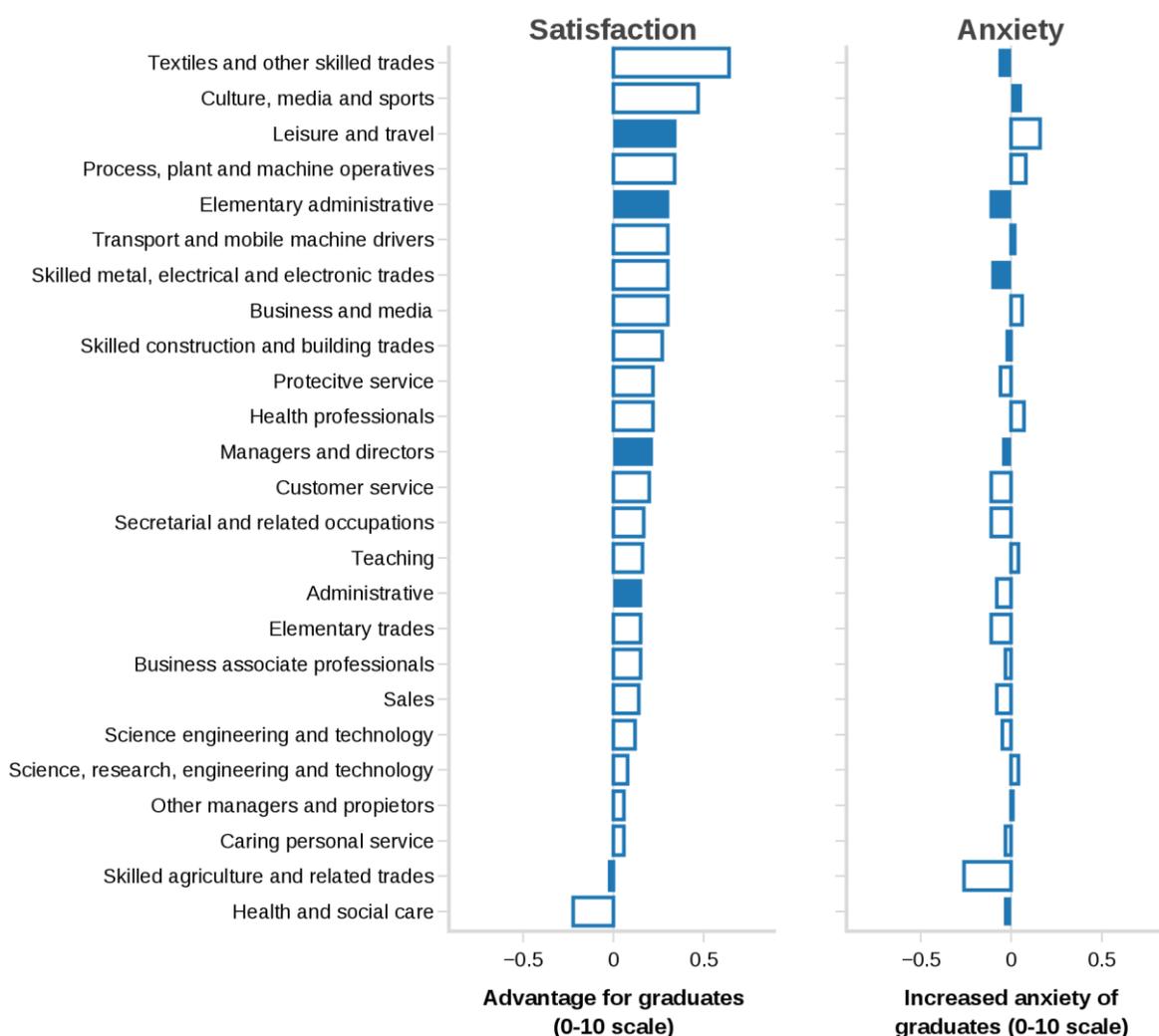
Occupation

63. The ONS' investigation of wellbeing in the APS found that respondents in higher managerial or professional occupations, on average, rate their life satisfaction higher than respondents in other occupational groups, and report higher anxiety levels than respondents in lower supervisory and technical occupations³⁷. Positions in higher managerial and professional occupations are disproportionately filled by graduates, which is consistent with the above evidence that employed graduates have both higher satisfaction and higher anxiety than non-graduates.

64. However, within occupations, the difference in wellbeing between graduates and non-graduates is usually indistinguishable from zero (see Figure 15). While effect sizes are positive for life satisfaction, few of the effects are significantly different from zero at the 5 per cent significance level. The occupation 'Managers and directors' is both significantly different from zero and has a high rate of graduate employment, but the effect size is small. That suggests graduates' high life satisfaction is closely related to their access to particular occupations.

65. The relationship between anxiety and higher education within occupations is even weaker, which reinforces the ambiguity of higher education's effect on anxiety.

Figure 15: Wellbeing across occupations



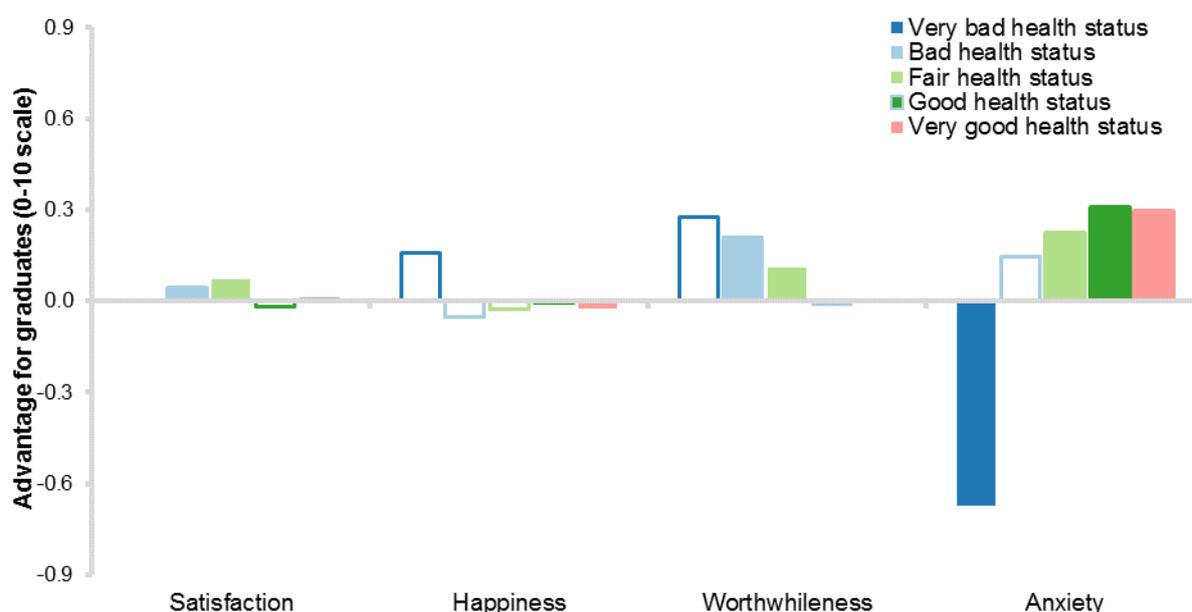
Note: This figure includes only respondents who are employees and have known occupations. Difference in mean wellbeing scores between graduates and non-graduates in occupational groups classified by two-digit SOC codes, split by respondent with and without higher education. For the anxiety scores, a lower score is 'better'. Filled in bars show that the difference is statistically significant to a 5 per cent significance level.

Health

66. The ONS considers self-assessed health to be the only personal characteristic on the APS that has a 'large' effect on all four wellbeing questions³⁸. Respondents with poor health report extremely low wellbeing; however, Figure 16 shows that, among those with 'Very bad' health, graduates have an anxiety score of 0.9 points less than the non-graduates. This is the biggest difference in wellbeing scores seen throughout this report. Graduates with very bad health also find their lives far more worthwhile than non-graduates with similar health problems.

67. These differences reinforce the above findings that graduates maintain a greater level of wellbeing in the face of difficulties in their lives. However, Figure 16 also supports the finding that graduates in good health are more anxious than non-graduates.

Figure 16: Wellbeing varies by health status



Note: Difference in mean wellbeing scores between graduates and non-graduates. For the anxiety scores, a lower score is 'better'. Filled in bars show that the difference is statistically significant to a 5 per cent significance level.

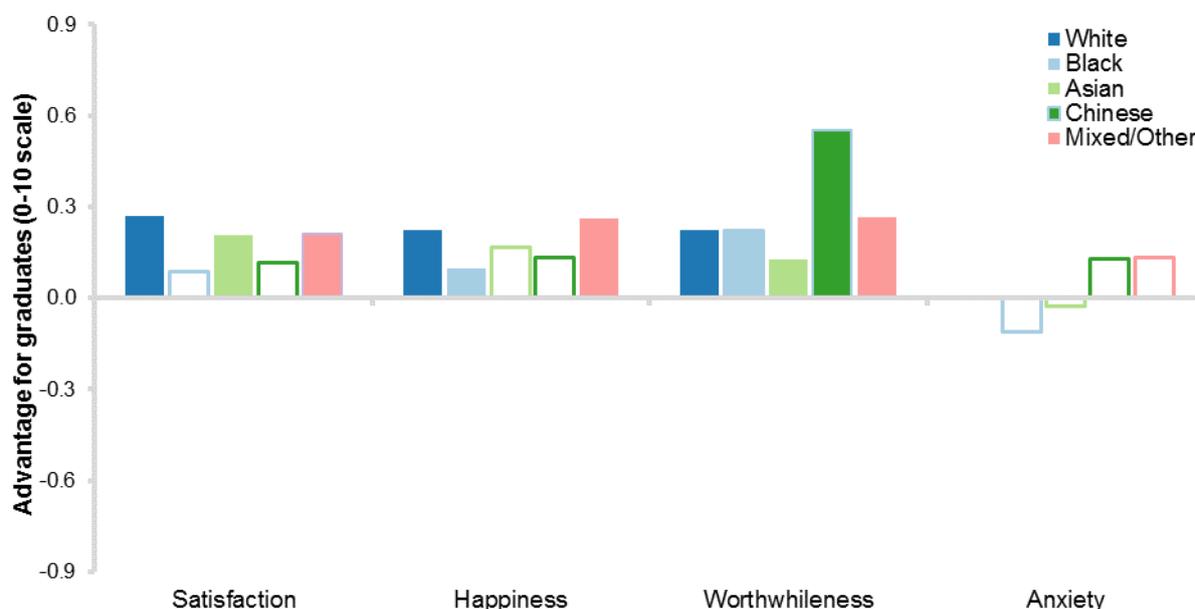
Ethnicity

68. Ethnicity is not a characteristic frequently discussed in the wellbeing literature, however the ONS did find a small relationship between ethnicity and subjective wellbeing³⁹. This is of great interest within the higher education sector, as degree outcomes and graduate satisfaction often differ between ethnic groups⁴⁰.

69. The ONS found that Black respondents were 0.5 points less satisfied with their lives than White respondents, and 0.2 points less happy. This is also reflected in the graduate population, where Black graduates are more commonly dissatisfied with their higher education⁴¹ and often have poorer degree outcomes⁴² than their peers.

70. However, Figure 17 shows that Black graduates have lower anxiety and a greater sense that their lives are worthwhile than Black non-graduates. There is some evidence that education has a different effect on people depending on their initial level of wellbeing, which could reconcile these findings. For example, people that have lower wellbeing could experience a positive, direct effect from higher education, but people with already-high levels of wellbeing could experience a negative effect⁴³.

Figure 17: Wellbeing varies by ethnicity



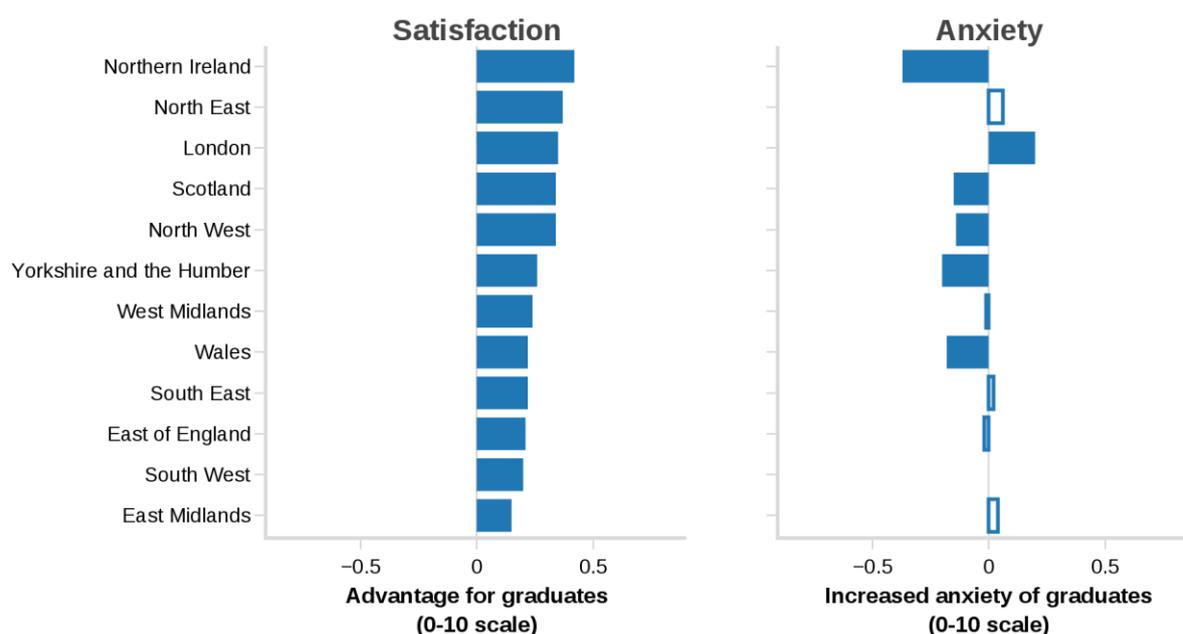
Note: The chart shows the difference in mean wellbeing scores between graduates and non-graduates. For the anxiety scores, a lower score is 'better'. Filled in bars show that the difference is statistically significant to a 5 per cent significance level.

Region

71. The ONS found that respondents living in London had higher anxiety levels than the rest of Great Britain⁴⁴. Figure 18 shows that, among those who live in London, graduates have higher anxiety levels than non-graduates. Notably, London is the only region in which graduates have significantly higher anxiety than non-graduates.

72. Our analysis has consistently found that many graduates have higher anxiety levels than non-graduates. This result suggests that part of the reason may be the concentration of graduates in London. However, there is also a concentration of certain industries, age groups, ethnicities and occupations in London, so further research is required to understand the relationship between these various circumstances and graduates' wellbeing.

Figure 18: Wellbeing across regions



Note: The chart shows the difference in mean wellbeing scores between graduates and non-graduates. For the anxiety scores, a lower score is 'better'. Filled in bars show that the difference is statistically significant to a 5 per cent significance level.

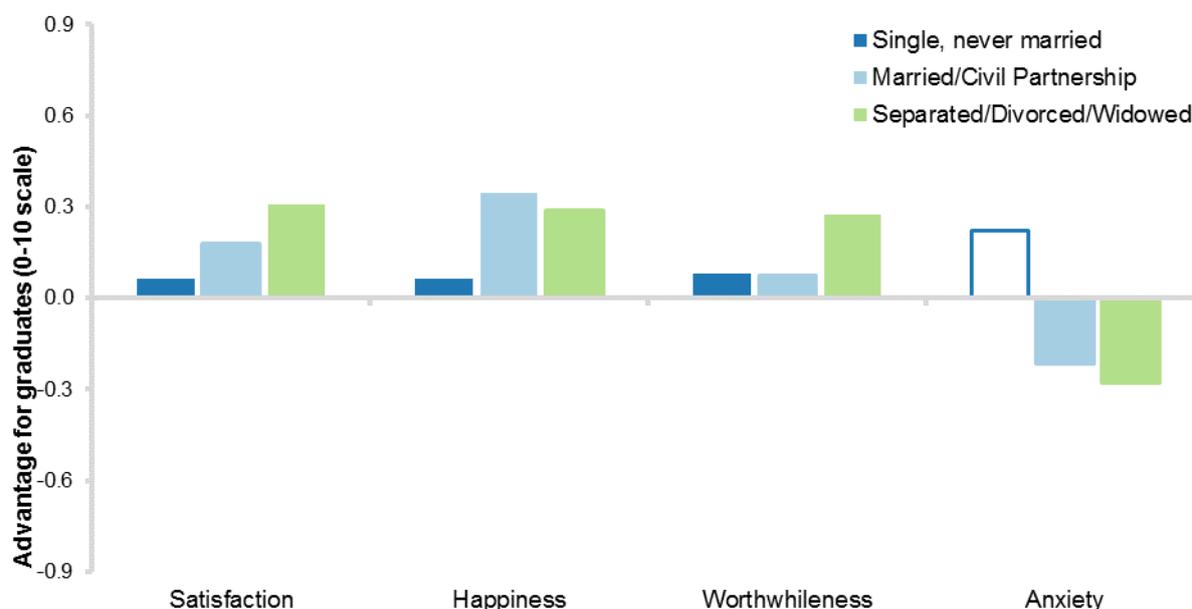
73. Despite the greater anxiety of graduates in London, graduates are more satisfied than non-graduates in all regions.

Marital status

74. The ONS found personal relationships to be the third most important factor affecting wellbeing, with separated, divorced or widowed respondents much less satisfied and more anxious than those that were married⁴⁵. Figure 19 shows that graduates are cushioned against this cost to wellbeing, with both single and married graduates have greater positive wellbeing than non-graduates.

75. Separated, divorced or widowed graduates stand out by having greater wellbeing on every dimension than non-graduates. Once again, within the group of respondents that on average have lower wellbeing, the graduates are happier and less anxious.

Figure 19: Wellbeing across marital status



Note: The chart shows the difference in mean wellbeing scores between graduates and non-graduates. For the anxiety scores, a lower score is 'better'. Filled in bars show that the difference is statistically significant to a 5 per cent significance level.

Further work

76. This report has found that the effect of education on wellbeing depends on the interaction of many aspects of a person's circumstances. To say that graduates have greater wellbeing than non-graduates is true, on average, but obscures the diversity of the effect that higher education has on different groups of graduates.

77. Future work on the subject will need to use statistical modelling techniques, informed by this analysis, to separate the various effects. It is insufficient to simply talk of the direct and indirect effects when the impact on different groups varies in both sign and magnitude.

78. More can be done with the APS but it may also be possible to use datasets such as the Longitudinal Destinations of Leavers from Higher Education survey, which specifically captures graduates from higher education. Unfortunately, that survey is also cross-sectional, but no survey presently exists that enables person-level fixed effects to be included while also disaggregating the graduate population by personal characteristics and circumstances. This limitation highlights the need for wellbeing data to be considered for collection in other surveys.

Annex A: Detailed grouping of qualifications

1. The ONS Annual Population Survey (APS) provides details of a person's highest qualification in the variable HIQUAL15. We have grouped the qualifications as in Table 3, drawing on Ofqual's Regulated Qualifications Framework, the Quality Assurance Agency for Higher Education's (QAA's) Framework for Higher Education Qualifications, HEFCE's definition of prescribed higher education, and discussions with the ONS and QAA.
2. Note that this grouping is peculiar to this report and does not exactly replicate any other classification. Many of the qualifications in the APS were obtained prior to the existence of the Regulated Qualifications Framework (RQF), the Framework for Higher Education Qualifications (FHEQ) or HEFCE, and do not easily fit existing criteria. While we have made efforts to adhere to existing classifications, these groups should not be considered definitive. As a sensitivity check, we have examined the number of individuals who might plausibly be reclassified to a different group. Our main results are not sensitive to such reclassifications.
3. In the report, we have classified people according to their highest qualification.

Table 3: Grouping of qualifications

| Grouping | Highest qualification | Graduate/Non-graduate |
|----------------------------|---|------------------------------|
| Doctorate | Higher degree – Doctorate | Graduate |
| Masters | Higher degree – Masters | Graduate |
| PGCE or equivalent | Higher degree – PGCE | Graduate |
| Other postgraduate | Higher degree – Other postgraduate NVQ level 5 Level 8 Diploma Level 8 Certificate Level 7 Diploma Level 7 certificate Level 8 Award Level 7 Award | Graduate |
| First degree | First degree/foundation degree - first degree Other degree | Graduate |
| Other undergraduate | First degree/foundation degree - foundation degree NVQ level 4 Level 6 Diploma Level 6 Certificate | Graduate |

| | | |
|--------------------------------|--|--------------|
| | Diploma in Higher Education Level 5 Diploma Level 5 Certificate Level 6 Award HNC/HND/BTEC higher etc. Teaching D further education Teaching D secondary education Teaching D primary education Teaching D foundation stage Teaching D level not stated Nursing etc. RSA higher diploma Other higher education below degree Level 4 Diploma Level 4 Certificate Level 5 Award | |
| A level or equivalent | | Non-graduate |
| GCSE A*-C or equivalent | | Non-graduate |
| Other qualification | | Non-graduate |
| No qualification | | Non-graduate |

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List of abbreviations

| | |
|-------------|---|
| APS | Annual Population Survey (ONS) |
| FHEQ | Framework for Higher Education Qualifications |
| HE | Higher education |
| ILO | International Labour Organisation |
| OECD | Organisation for Economic Co-operation and Development |
| ONS | Office for National Statistics |
| PGCE | Postgraduate Certificate in Education or Professional Graduate Certificate in Education |
| QAA | Quality Assurance Agency for Higher Education |
| RQF | Regulated Qualifications Framework |
| SOC | Standard Occupational Classification |

Notes

- ¹ Department for Business, Innovation and Skills, 'The Benefits of Higher Education Participation for Individuals and Society : Key Findings and Reports "The Quadrants"'.
² Kennedy, 'Remarks at the University of Kansas'.
- ³ Sinclair, *Statistical Account of Scotland*, 20:13.
- ⁴ European Commission, 'About Beyond GDP'; Stiglitz, Sen, and Fitoussi, 'Report of the Commission on the Measurement of Economic Performance and Social Progress'.
- ⁵ 'Measuring Well-Being and Progress: Well-Being Research – OECD'; Gleisner, Llewellyn-Fowler, and McAlister, 'Working Towards Higher Living Standards for New Zealanders'.
- ⁶ Office for National Statistics, 'Measuring National Well-Being Programme'.
- ⁷ Allin and Hand, 'New Statistic for Old? Measuring the Wellbeing of the UK', 2–4; HM Treasury, 'The Green Book', 58.
- ⁸ For example, Thorley, 'Not by Degrees: Improving Student Mental Health in the UK's Universities'.
- ⁹ For example, Walker and Zhu, 'The Impact of University Degrees on the Lifecycle of Earnings'; Walker and Zhu, 'Differences by Degree'; Britton et al., 'How English Domiciled Graduate Earnings Vary with Gender, Institution Attended, Subject and Socio-Economic Background'.
- ¹⁰ See Department for Business, Innovation and Skills, 'The Benefits of Higher Education Participation for Individuals and Society : Key Findings and Reports "The Quadrants"' for a summary of the UK literature.
- ¹¹ Diener, 'Traits Can Be Powerful, but Are Not Enough'.
- ¹² Oguz, Merad, and Snape, 'Measuring National Well-Being – What Matters Most to Personal Well-Being?', 6.
- ¹³ Gerdtham and Johannesson, 'The Relationship between Happiness, Health and Socio-Economic Factors: Results Based on Swedish Micro Data', 14.
- ¹⁴ Blanchflower and Oswald, 'Well-Being over Time in Britain and the USA', 1370–71.
- ¹⁵ Clark and Oswald, 'Satisfaction and Comparison Income', 13–14; Clark and Oswald, 'Well-Being in Panels'.
- ¹⁶ Mishra et al., 'The Job Satisfaction-Life Satisfaction Relationship Revisited: Using the Lewbel Estimation Technique to Estimate Causal Effects Using Cross-Sectional Data'.
- ¹⁷ Powdthavee, Lekfuangfu, and Wooden, 'What's the Good of Education on Our Overall Quality of Life?', 17.
- ¹⁸ Lekfuangfu, Powdthavee, and Wooden, 'The Marginal Income Effect of Education on Happiness: Estimating the Direct and Indirect Effects of Compulsory Schooling on Well-Being in Australia', 23.
- ¹⁹ Winkelmann and Winkelmann, 'Why Are the Unemployed So Unhappy?', 10–13.
- ²⁰ Gerdtham and Johannesson, 'The Relationship between Happiness, Health and Socio-Economic Factors: Results Based on Swedish Micro Data', 14.
- ²¹ Oreopoulos and Salvanes, 'Priceless', 166–67; Powdthavee, Lekfuangfu, and Wooden, 'What's the Good of Education on Our Overall Quality of Life?', 21; Blanchflower and Oswald, 'Well-Being over Time in Britain and the USA', 1381.
- ²² Powdthavee, Lekfuangfu, and Wooden, 'What's the Good of Education on Our Overall Quality of Life?', 18.
- ²³ Dolan, Peasgood, and White, 'Do We Really Know What Makes Us Happy?', 99–100.
- ²⁴ Winkelmann and Winkelmann, 'Why Are the Unemployed So Unhappy?', 13.
- ²⁵ Higher Education Funding Council for England, 'Differences in Degree Outcomes: The Effect of Subject and Student Characteristics'; Higher Education Funding Council for England, 'Graduate Satisfaction with Undergraduate Choices'.
- ²⁶ Higher Education and Research Act 2017, sec. 83(1).
- ²⁷ Note that these are not causal differences and cannot be interpreted as the marginal effect of education on income, see Walker and Zhu, 'The Impact of University Degrees on the Lifecycle of Earnings'. However, the same caveats apply to the differences in wellbeing, which may also have significant ability bias. The raw difference points to a need for further research.
- ²⁸ Department for Education, 'Employment and Earnings Outcomes of Higher Education Graduates by Subject and Institution: Experimental Statistics Using the Longitudinal Education Outcomes (LEO) Data', 1.
- ²⁹ Seligman, *Flourish: A Visionary New Understanding of Happiness and Well-Being*.

³⁰ Department for Education, 'Employment and Earnings Outcomes of Higher Education Graduates by Subject and Institution: Experimental Statistics Using the Longitudinal Education Outcomes (LEO) Data', 1.

³¹ For example, Oguz, Merad, and Snape, 'Measuring National Well-Being – What Matters Most to Personal Well-Being?', 11.

³² Winkelmann and Winkelmann, 'Why Are the Unemployed So Unhappy?', 10–13; Oguz, Merad, and Snape, 'Measuring National Well-Being – What Matters Most to Personal Well-Being?', 31–33.

³³ Office for National Statistics, 'Graduates in the Labour Market', 3.

³⁴ Lekfuangfu, Powdthavee, and Wooden, 'The Marginal Income Effect of Education on Happiness: Estimating the Direct and Indirect Effects of Compulsory Schooling on Well-Being in Australia', 17–20.

³⁵ Oguz, Merad, and Snape, 'Measuring National Well-Being – What Matters Most to Personal Well-Being?', 8.

³⁶ See, for example, Clark and Oswald, 'Satisfaction and Comparison Income' and; Clark and Oswald, 'Well-Being in Panels'.

³⁷ Oguz, Merad, and Snape, 'Measuring National Well-Being – What Matters Most to Personal Well-Being?', 31.

³⁸ Oguz, Merad, and Snape, 4.

³⁹ Oguz, Merad, and Snape, 13.

⁴⁰ Higher Education Funding Council for England, 'Differences in Degree Outcomes: The Effect of Subject and Student Characteristics'.

⁴¹ Higher Education Funding Council for England, 'Graduate Satisfaction with Undergraduate Choices'.

⁴² Higher Education Funding Council for England, 'Differences in Degree Outcomes: The Effect of Subject and Student Characteristics'.

⁴³ Binder, 'Revisiting Cheerful Jane and Miserable John'.

⁴⁴ Oguz, Merad, and Snape, 'Measuring National Well-Being – What Matters Most to Personal Well-Being?', 40.

⁴⁵ Oguz, Merad, and Snape, 4–5.