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overeducation and reduced life
satisfaction**

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Heaven Knows I'm Miserable Now: Overeducation and Reduced Life Satisfaction.

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Heaven Knows I'm Miserable Now: Overeducation and Reduced Life Satisfaction.

This study is an investigation into relative overeducation and life satisfaction using British longitudinal data. The focus is on young people rather than the whole of the life cycle, avoiding the possibility that overeducation may simply capture the increased participation in Higher Education of the young. The hypothesis is that there is a negative relationship between being overeducated and life satisfaction, and a key reason for this relates to comparisons (both with others, and the past). Using dynamic panel analysis, to account for omitted dynamics, such an association is found: the relatively overeducated seem to be relatively less happy. This result appears to fade over time, consistent with the relative comparisons notion. In addition, evidence is presented that income compensates somewhat for the loss of life satisfaction incurred by the overeducation.

Keywords: Life Satisfaction, Happiness, Overeducation, Dynamic Panel Analysis, BHPS.

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Heaven Knows I'm Miserable Now: Overeducation and Reduced Life Satisfaction.

1 Introduction

This study is an investigation into overeducation and life satisfaction, with overeducation being based on a statistical comparison between an individual's level of education and the average for one of two employment based reference categories. This investigation is based on young people to avoid the possibility of these overeducation measures simply capturing cohort differences with respect to level of education. Younger people have, on average, higher levels of education than older people (Walker and Zhu 2008), and the overeducation variable may be a reflection of age rather than overeducation. The broad hypothesis is that the relatively overeducated may experience less average life satisfaction (*ceteris paribus*) than individuals who are not overeducated. One reason for this is through raised expectations (due to higher levels of education) being unmet; another is through dissatisfaction resulting from comparisons being made by individuals with others in the same (or a similar) position in terms of employment, who have invested less in their education. These possibilities are discussed more in this section. Supporting these suggestions are some happiness and education studies which hint at an association between them via overeducation (though not explicitly) and these are discussed, along with other relevant literature, in section 2. The specific methodological issues for the empirical investigation are discussed in section 3. The results and concluding remarks follow, in sections 4 and 5 respectively.

The arguments briefly made above for a potential negative relationship between life satisfaction and overeducation are through relative comparisons. Relative or comparison effects have been repeatedly argued to be, and demonstrated as, important both within

economics and particularly ‘the economics of happiness’ literature. (For example, Veblen 1890, Duesenberry 1948, Frank 1985, and Clark et al. 2008, all of which provide either arguments, or evidence, or both for the importance of relative concerns.) Here, the relatively overeducated are doing the same (or a similar) job as others but have invested more in education. This comparison is one potential pathway through which being relatively overeducated may depress life satisfaction. Similarly, a relatively overeducated individual may make another comparison with a similar dissatisfying outcome: a comparison with the past (or their current situation and their expectations formed in the past). An individual may have invested in more education, only to find that his or her employment situation has not improved much (or at all). As the education has had little or no labour market impact, the individual may wonder whether it was worth it and be less satisfied because of this. Because this study has at its focus British individuals in the twenties age range, it can make a better assessment of these relative comparisons (young people comparing themselves to other young people, and can also perhaps better remember their expectations prior to participating in Higher Education) and has methodological advantages compared to overeducation studies looking at a longer lifecycle (or over the lifecycle). These are discussed in more detail below, however whole lifecycle (or working life) studies of overeducation are often capturing the changing levels of education by age rather than overeducation itself. The young are more likely to have higher levels of education and, dependent on how overeducation is measured, may be overrepresented in the overeducation variable.

Little theoretical guidance regarding overeducation and well-being comes from other disciplines. From psychology and sociology there are, currently, few studies that look at the relationship between overeducation and mental well-being. Notable examples are Kasl (1974) and Coburn (1975), which both found adverse effects on mental well-being amongst

overeducated individuals via an achievement and aspiration mismatch, as suggested above. Interestingly, Coburn (1975) also found that if overeducation is self-perceived, rather than objectively measured, the adverse effects on mental well-being are more significant. Within psychology, there are contributions to the emerging literature that links non-cognitive skills with labour market outcomes, for example Blázquez Cuesta and Budría (2011). The relationship between personality and the specific labour market outcome of overeducation is analysed by Blázquez Cuesta and Budría although that study, whilst interesting, seems to have a sizeable flaw (discussed in the literature review), and other research is currently underway linking personality types and personality changes to happiness (e.g. Boyce et al. 2012).

Here the interest is in ‘whole of life’ satisfaction and overeducation, however job satisfaction is, theoretically, potentially important. A pathway between overeducation and life satisfaction could be job satisfaction. Unmet aspirations in the workplace could result in reduced job satisfaction, which may lead to reduced life satisfaction. This is known as the spillover effect, reflecting a positive correlation between work and life satisfaction, although other possibilities for this oft-studied relationship exist: a segmentation effect (where there is no correlation) and a compensation effect (where there is a negative correlation). Evidence has been found for all three possibilities, often using the methodology of Judge and Watanabee (1994). A recent example is Georgellis and Lange (2012) who assert more than once that it is a highly complex and nuanced relationship. They quote Lambert (1990) who discusses the three competing theories (spillover, segmentation, compensation) linking job and life satisfaction and argues that that these “are treated as competing explanations, even though evidence and logic suggests that all three [possibilities] operate to link work and family” (p.239). As Georgellis and Lange (2012) show, this complex issue is somewhat different for individuals with different cultural backgrounds, social class, and different religious beliefs.

This relationship remains an open question, and because of this is not part of the empirical investigation undertaken here.

2 Literature review

This section reviews the literature regarding the relatively overeducated and life satisfaction. Whilst there are no previous studies of a direct relationship between overeducation and life satisfaction, there are, within the happiness and education literature, some studies that hint at an association via overeducation. Some of these studies are briefly mentioned here, complementing the initial overeducation discussion. There is some evidence to suggest that how overeducation is measured has significant consequences for its incidence and any subsequent empirical results, an issue also given some attention below.

The literature defines overeducation as “having more education than is required for one’s job” (Rubb, 2003) and various explanations for being overeducated include individuals overcompensating for their lack of other ability or experience, or as part of a career plan (Sicherman 1991; Groot 1993). Similarly, overeducation could also result from having no career plan. The increase of participation in HE in the UK raises the possibility of an increase in the incidence of overeducation. Belfield (2000) makes a similar comment about several countries, demonstrating that such concerns are shared elsewhere:

With rapid recent expansion of participation in higher education in most Western economies, there are concerns that some graduates may find a degree to be a poor investment (although these concerns do appear to be perennial, Lange 1998). Some new graduates may find work for which they are over-educated or at which they are underutilised (Belfield 2000, p.35).

Groot et al. (2000) in a meta-analysis of both the incidence of, and the economic returns to, overeducation, offer OECD statistics to support their claim that “one of the most remarkable social developments of past decades in all western countries has been the increase in the

educational level of the population” (p.149). If this increase in the supply of higher educated labour is not matched with the demand for highly-educated labour, widespread overeducation is a possibility.

Further evidence for overeducation for UK graduates comes from Dolton and Vignoles (1997) who find that 38% of graduates are overeducated for their first job, a figure that falls to 30% six years after graduation. Data from the 1995 Labour Force Survey puts graduate overeducation at between 27%-38% (Alpin et al. 1998) and a survey from 1996 puts the figure at 40% (Battu et al. 1999). This suggests that overeducation, for graduates, has, for some time, been a sizeable issue. Belfield (2000, p.38) asserts that "although there has been a large expansion in the numbers of graduates in the UK over the last ten years, there is no clear evidence that over-education has increased”. This is not a universal judgement. Groot et al.’s meta-analysis of the same year makes contradictory claims regarding how the incidence overeducation has changed over time, and Section 3 below provides evidence of increasing overeducation since 1991 with British (BHPS) data.

The choice made regarding the measurement of overeducation is likely to be important. Meta analyses (Groot and Massen van den Brink 2000; Rubb 2003; Kucel 2011) find significant differences in the both the incidence of overeducation, and, where also investigated, the results of subsequent analysis (e.g. returns to education, job satisfaction) by measurement. The measurement used in this study is the statistical, objective ‘realised matches approach, and the meta-analyses mentioned above find that the ‘realised matches’ method used gives lower estimates (when compared to other measures) of the incidence of overeducation. A useful discussion of overeducation and measurement issues is Verhaest and Omey (2006). Groot (1996), using the one standard deviation definition, finds overeducation within the first

wave of the BHPS (i.e. 1991) to be at 11%, with males being less well 'skills matched' than females.

The main focus here is on the happiness of the relatively overeducated; however, the rates of return to education and overeducation, not especially considered here, are potentially important channels (and thus income should be controlled for). A recent meta-analysis, Leuven and Oosterbeek (2011), suggests a rate of return for a year of required (or matched) schooling of about 9%, whereas the return to a year of overeducation is about 4.5%. Some studies, largely from within psychology, do not control for income and thus present an unconditional correlation for the impact of education (and overeducation) on non-monetary outcomes. An example of this is Cassidy and Wright (2008), who look at graduate employment status and its association with psychological well-being (among other factors). They use different measures of health, including the GHQ-12 scores, popular as a proxy for happiness in the economic literature. They use a small sample, based on a questionnaire administered at two points in time, and their results indicate that graduate underemployment is detrimental to psychological health. Here underemployment is defined by the individuals responding to the survey as being in a 'stop-gap' job, perhaps similar to a subjective assessment of overeducation. However, it should be noted, that this study does not take into account any impact of low(er) income (from unemployment and underemployment) on well-being, which may have a modifying effect on the unhappiness of both graduate employment statuses – unemployment and underemployment - studied by Cassidy and Wright. Are underemployed individuals relatively unhappy because of a lower income or is it because of the nature of their employment? The Cassidy and Wright study cannot make this distinction. The study is also limited by its small sample size (less than 250 individuals), and its focus on individuals who were students at just one UK university.

Another interesting study is Blazquez Cuesta and Budria (2011), which investigates the impact of personality traits on transitions into and out of jobs for which individuals were overeducated. They employ the realised matches method of measuring overeducation based on occupation category and find, using the German Socio-Economic Panel between 2000 and 2008, an 86-89% state dependence to overeducation, which means that 86-89% of individuals in the sample overeducated in one year are overeducated in the subsequent year. Given that the average age of the respondents is 41.5, it is unlikely that years of schooling will be changing for many of these individuals: what they are really measuring is transitions into and out of occupational categories. The authors find the persistence rate of overeducation to be “remarkably large... [and that] only two percent of those who were not overeducated in one particular year are overeducated in the following year” (Blazquez Cuesta and Budria 2011, p.11). This seems to have little to do with overeducation per se, and more to do with people changing jobs and entering different occupations.¹ It appears that not many people do change jobs. Given the increase in participation in higher education in Western Nations like Germany, it is likely that their overeducation dummy is capturing to a large extent younger people. Our study, with its focus on the twenties does not face this problem of overeducation capturing the cohort change of increasing qualifications amongst the young. Whether the dummy simply captures this effect in the Blazquez and Cuesta study is unclear because little information is given about the breakdown of the overeducated. Also, little information is given regarding the occupational categories and this is a major omission since the study is really about the transitions into different occupations (however they are measured), rather than transitions into and out of overeducation. Whether the persistence figures are

¹ This raises the additional possibility of promotion being a pathway out of overeducation. Due to the construction of the relative overeducation variable it is unlikely to be captured in this study, nor with the data used in this study, but it is a potential source of bias in capturing the happiness impact of overeducation. This is returned to in the methodological discussion. The author thanks Geoff Pugh for the initial suggestion and valuable discussions. This notion of a potential “settling in” period is also discussed by Dolton and Vignoles (1997).

‘remarkably large’ or not depends on a comparison with typical rates of individuals changing their occupation category. It is not a claim that can be made without this information.

Fleming and Kerr (2005) use Australian data to investigate the relationship between overeducation and job satisfaction. They find some evidence that being overeducated in the labour market can lead to reduced job satisfaction (and lower productivity), although the implications for ‘whole of life’ satisfaction remain untested. Belfield (2000), in a survey, argues similarly, stating that ‘matched’ (i.e. neither over nor undereducated) workers report significantly higher levels of job satisfaction than unmatched workers. Studies and surveys such as Veenhoven (1996) and Khattab and Fenton (2009), find evidence that, in some cases, the highly educated are less satisfied with life than individuals who are considered to have a medium level of education. The authors speculated that this negative association may have been due to a lack of available jobs at that level of education, and that perhaps unhappiness is also due to the aspirations or expectations-increasing nature of education (which are relatively unmet by the overeducated). Thus, being overeducated may have negative consequences for well-being, after controlling for income (and other standard controls), leading to the main hypothesis of this paper:

H1: Being overeducated is correlated with a lower level of happiness (ceteris paribus)

The next section discusses the data used to investigate this hypothesis and the reasons for the particular econometric approach utilised.

3 Data discussion and methodology

The data come from the British Household Panel Survey (BHPS), a nationally representative survey, which was established in 1991. Popular for ‘the economics of happiness’ investigations, it is a major source of micro-level panel data in the UK with the same representative sample of individuals interviewed repeatedly over a period of years. From 1996, the BHPS contains a direct satisfaction question where the interviewee is asked ‘how dissatisfied or satisfied are you with your life overall’ with possible responses running from 1 to 7 representing not satisfied at all to completely satisfied. This is an ordinal scale but, as is common in the happiness literature here it is treated as cardinal. See Ferrer-i-Carbonell and Frijters (2004) for a detailed and influential study, which lead to the widespread acceptance of treating happiness or satisfaction scores as cardinal. Brief descriptive statistics for the life satisfaction dependent variable follow the discussion regarding the overeducation variables.

Here, the key independent variable is a dummy variable for the relatively overeducated. Establishing the incidence of overeducation, in the first instance, follows the method of Groot (1996), the realised matches method: a comparison is made between an individual’s education level and the average education level of their job, as demonstrated by one of nine broad occupational classifications. Additionally, a refinement is made to the reference group where the broad occupational category is combined with a broad industry indicator to create eighty-one smaller reference groups.² In each case, an individual is classed as overeducated if their level of education (measured by years of schooling) is more than one standard deviation above the average years of education for their peers (those in the twenties age range) in the

² A further dummy variable was created which measures relative overeducation by both occupation and gender combined: on the basis that males may compare themselves primarily with other males and females with other females. In practice, the results from this addition are qualitatively the same as those for the dummies mentioned above, and as such are not discussed further.

same occupational group (or occupation-industry group for the alternative measurement).³ This ‘realised matches’ approach often gives, as the literature review above explains, the lowest incidence of overeducation of its various measures, thus being a more demanding criterion for assessing overeducation. Here this measurement is chosen for pragmatic reasons of data availability and is not without its problems. As Sloane et al. (1999) note, overeducation as measured by Groot does not account for the heterogeneity of jobs within the occupational categories, and the quality of education is difficult to take into consideration. The inclusion of an industry classification in this study mitigates this first criticism somewhat, but not wholly so: the remaining categories will still contain heterogeneity in terms of the jobs individuals do. Also education and overeducation, when measured by years of schooling, does not take into account the different levels of attainment that individuals have. Furthermore, Groot’s (1996) analysis considered all ages as the comparator group so his overeducation variable may well have been picking up cohort effects: younger individuals having, on average, more years of education. Many authors have demonstrated this changing pattern of education over time, with a significantly higher percentage of younger people having higher qualifications than older individuals (Chowdry et al. 2010; Walker and Zhu 2008).

Figure 1 demonstrates the incidence of overeducation, i.e. individuals in their twenties who have greater than one standard deviation of education (captured by years of schooling) more than the mean for their reference group, over time. The incidence of the second measure discussed above follows this pattern but is somewhat smaller (not shown). This is because the size of the reference group, in some cases, is quite small and no individual is classed as overeducated when measured by the standard deviation criteria. Overall, the pattern here of

³ The actual amount of years is quite varied dependent upon the reference group.

increasing incidence of overeducation over time is consistent with increasing participation in higher education of young people, an outcome we would expect to see in a nationally representative dataset like the BHPS.⁴

[FIGURE ONE ABOUT HERE]

The descriptive averages for life satisfaction for the overeducated do not indicate any significant difference from the life satisfaction for the whole of the sample. Average self-reported life satisfaction of individuals, in their twenties, who are overeducated when measured by the first category (occupation only) is 5.22, and for the second category (occupation and industry) it is 5.16, whereas it is 5.21 for the lifecycle as a whole (recall that the scale is 1 to 7, with 7 being completely satisfied with life). This latter figure includes, of course, the unemployed and their life satisfaction responses are, on average, 4.6 which brings the whole sample average down. The following figure shows the average by gender over time (note well that the life satisfaction was first asked in 1996).

[FIGURE TWO ABOUT HERE]

The happiness function used here is similar to those of the wider empirical happiness literature, but with the addition of the dummy variable for overeducation. Other variables are listed below. Ultimately we decide to estimate using a dynamic specification (and the reasons for this are presented below), hence the presence of the lagged dependent variable in the equation below.

$$LS_{it} = \alpha_0 + \alpha_1 LS_{it-1} + \alpha_2 educ_{it} + \alpha_3 inc_{it} + \alpha_4 overed_{it} + X_i' \beta + v_i + \epsilon_{it} \quad (1)$$

⁴ Overeducation is more prevalent than unemployment (not shown), affecting between 1.5 and 3 times as many individuals in this sample, depending upon how overeducation is measured.

This happiness function is typical but with the addition of overeducation, and X_i is a $1 \times k$ vector of covariates and β is a $k \times 1$ vector of parameters. v_i are the panel-level effects (which may be correlated with the covariates), and ϵ_{it} are independent and identically distributed over the whole sample. The independent variables are standard in the well-being literature and include real income (deflated by the CPI), education (captured by years of schooling), marital status, health, age, and region. The estimate is also undertaken by gender. If the coefficient on overeducation (*overed*), α_4 , is both negative and statistically significant, the estimation provides evidence for the hypothesis that being overeducated (relative to your peers) is associated with reduced life satisfaction (after income, education and other control variables are taken into account).

A footnote above suggested that a route out of overeducation could be to do with promotion. There are some occupations that are open to both graduates and non-graduates (policing, fire service, nursing and so on). While a graduate might initially be “overeducated” for the operational nature of the job, he or she might well have an advantage with respect to gaining rapid promotion. Such considerations could indicate a potential bias in estimating the happiness effect of overeducation. Graduates may, so to speak, invest by entering non-graduate occupations, trading off temporary “overeducation” for better prospects of rapid promotion into jobs in which their education will be appropriately utilised, and in which they may have better pay and/or status than their similarly educated peers in “graduate” occupations. If such investment considerations are at all widespread then we have a group that while overeducated in the lower ranks, early on in a career, may nonetheless record high levels of happiness that reflect their feeling of having made a good investment (e.g. the graduate PC working with non-graduate PCs but with a good chance of fast tracking to

Inspector). In this case, the larger this group the bigger the bias in estimates of the overeducation effect on happiness (i.e. in the aggregate, ceteris paribus, the overeducation effect will be underestimated).⁵

Given the data set used, it is not possible to control for such occupations – i.e. those open to both graduates and non-graduates; or, in general, to entrants with widely differing levels of education. Perhaps future studies, if they make use of very fine grained occupational data could implement such controls, and remove this potential source of bias. For this investigation, we note that the happiness effect of overeducation might be underestimated.

The discussion now turns to the appropriate model choice. As mentioned above, dynamic panel analysis is used, and here follows a brief explanation why, as well as a consideration of the relevant issues. For typical overeducation regressions taking advantage of the panel nature of the data (i.e. estimated by standard static panel effects models), a null hypothesis of no first order serial correlation is strongly rejected ($p=0.0000$).⁶ This means that there are omitted dynamics not considered by the more typical panel data methods of estimation. Hence a discussion has to be had regarding the best way to model these omitted dynamics. One possibility is a dynamic panel model, if statistically appropriate. Another possibility is to model the dynamics in the residual, a good choice if the variable of interest is historic (because the effects of interest would be captured in the ‘blackbox’ of the lagged dependent variable) because, in a model with a lagged dependent variable, the interpretation of the coefficients on the independent variables relates to their short-run or contemporaneous

⁵ This is particularly the case with the study here due to the restricted age range focus.

⁶ This is often untested in the happiness of economics literature, and suggests that some of the static estimates in this area are potentially misspecified.

effects.⁷ However, the relative overeducation dummies are arguably contemporary variables with contemporaneous relevance (being currently overeducated is likely to impact on current life satisfaction) and be usefully assessed via a dynamic panel model. Whilst methodologically appropriate, is dynamic panel modelling statistically appropriate?

Some initial estimates were made to test this (output omitted, but discussed below in the results section) and the outcome is a qualified yes: in most variants the diagnostic tests indicate that dynamic panel analysis is statistically appropriate. These diagnostic tests deal with the choice of instrumentation (how many lags can instrument for levels, and how many levels can instrument for lags), the choice any researcher makes about the endogeneity or exogeneity of the independent variables (potentially very important for happiness research), as well as addressing the initial conditions problem.⁸ In the context of well-being, these are addressed in Piper (2012a), and some of that discussion reflects the advances in understanding of these models by Roodman (2006, 2007, 2009a, 2009b). Further support for dynamic panel analysis is offered by the model passing Bond's informal test: the coefficient on the lagged dependent variable obtained via the dynamic model lies between the OLS and the fixed effects estimates (which are biased upwards and biased downwards respectively) (Bond 2002). In summary, dynamic panel modelling is appropriate here.

⁷ Calculating long-run coefficients is straightforward, and undertaken in the reference section. A recent paper that uses this dynamic panel method in an education context is Pugh et al. (2011), a paper which was formally commended at the 2012 British Educational Research Association.

⁸ For the initial conditions test, the key diagnostic is the difference-in-Hansen test, and no evidence of an initial conditions problem is found. This is to be expected somewhat with happiness data, because one year's values have only a limited influence in the values of other years. The initial conditions – the relationship between the unobserved fixed effects and the observables *at the time of the start of the panel subset employed* – may almost never be particularly important for well-being data.

4 Results

This section collects the results of the overeducation estimates. In the previous section it was argued that a dynamic panel model is the preferred model because (a) it can address the omitted dynamics present in the data and (b) relative overeducation is a contemporary state so its effects are likely to be captured by the independent variable rather than being wholly captured by the lagged dependent variable itself.⁹ The diagnostics regarding dynamic panel analysis, for these estimations, offer a free choice regarding instrumentation and lag length. The results presented here are from estimations that use ‘default instrumentation’, i.e. lags of $t-2$ and higher, but other instrumentation choices also support the results obtained here. Minimum instrumentation gives qualitatively the same results in all cases.

The overall result is that relative overeducation for employed individuals in the twenties age range is associated with lower life satisfaction, after controlling for education itself, income, and other standard controls. However, the results appear to be different by gender (though we return to this near the end of this section). Table 1 presents the results from overeducation when measured by occupation. The columns represent all respondents, males only, and females only, respectively. In all cases, the standard errors are cluster robust to heteroscedasticity and arbitrary patterns of within-group correlation, and the estimation uses the twostep procedure.

[TABLE ONE ABOUT HERE]

⁹ Lagged independent variables were used, consistent with the non-rejection of the common factor restrictions (see Piper 2012b); however, they were all insignificant and so were dropped from the final models (output not shown).

The table provides evidence of a negative relationship between overeducation and life satisfaction. Other things being equal, overeducated young people are less satisfied than those who are not considered overeducated. This finding is statistically significant at the 1% level for everyone and at the 5% level for males separately. Restricting the sample to females does not result in such an association: the sign on the overeducation coefficient is negative but the p-value is approximately 0.09 and thus the estimated coefficient is not significant. For all the estimates in table 1, marriage, and excellent (and good) health are associated with higher life satisfaction; widowhood with lower. There are two slightly unusual results here: for males, health is insignificantly associated with life satisfaction and, for females, income has a negative coefficient. Perhaps the former result indicates that employed males in their twenties take their good or excellent health for granted. Though not significant at a 95% level, the negative coefficient on income for females is somewhat surprising and may indicate that a higher income reflects a more stressful job, a longer commuting time, and more time at work away from the family. Alternatively, someone may get an easier job, with fewer responsibilities and lower income and the balance is higher utility.

The coefficient on lagged life satisfaction, the lagged dependent variable, is highly statistically significant but very small. This is consistent with the results from Piper (2012a): past levels of life satisfaction have little to do with current life satisfaction. Happiness is largely a contemporary phenomenon. This small coefficient on the lagged dependent variable indicates that the long-run outcomes are not very different to the directly estimated coefficients of the model; long-run coefficients are calculated and included in the summary table, table 2, below. The long-run coefficient is calculated as in Wooldridge (2002). Given the low value of the lagged dependent variable, it is no surprise that the long-run coefficients

for overeducation are not too far from the short-run (or contemporaneous) coefficients estimated above.

[TABLE TWO ABOUT HERE]

Regressions using the alternative measure of overeducation provide some support for individuals who are relatively overeducated reporting less satisfaction with life, other things being equal, and can be seen in table 3.¹⁰

[TABLE THREE ABOUT HERE]

The results in table 6, using the alternative measure of relative overeducation, offer some support the conclusions drawn from the occupation-only measure. The negative coefficient on overeducation is significant at a level just higher than 5%. Here, both genders in the sample together maintain the negative relationship between relative overeducation and life satisfaction. The p-value for overeducation for everybody is 0.054, a result which falls to 0.053 when the long-run coefficient is calculated, as displayed in table 4. And for males, the p-value for overeducation is 0.059, a result which falls to 0.056 when the long-run coefficient is calculated. The economic interpretation of the other variables here is similar to that for table 1. With this alternative measure relative overeducation is insignificant for life satisfaction for females, further supporting the analysis of the first measure of overeducation.

[TABLE FOUR ABOUT HERE]

The results presented in these tables seem to present strong evidence that overeducation is associated with lower life satisfaction. The size of the negative coefficient, when measured

¹⁰ The fewer waves that can be employed with this created reference group to measure overeducation (as explained above) explains the lower number of observations used for the estimations when compared to the number used in table 4.

by the combination of occupation and industry, is, for males, about half the size of the positive benefit associated with being married. For the first measure of overeducation, the negative overeducation effect is about a third of the size of the positive benefit associated with being married. This proportion is smaller for the negative result found for both genders together.

In summary, with both measures of overeducation used here, and for the whole sample, relative overeducation is negative and statistically significant at, or close to, the 5% level with life satisfaction. Thus, the hypothesis of a negative relationship between these two variables is supported. Again, the long-run coefficients for overeducation are not too far from the short-run (or contemporaneous) coefficients, a reflection of the finding that happiness is largely (though not wholly) a contemporary phenomenon.

An open question, given the increase in the participation of individuals regarding higher education, is whether this finding is consistent over time. This was investigated by splitting the data set into two time periods, and this particular analysis of the data suggests that there is a cohort effect: the negative impact of being relatively overeducated has an impact only in the earlier sample, and not the later sample. The two tables below present results from 1997-2000 (tables 5 and 6), and 2002-2007 (tables 7 and 8 respectively). This splits the dataset in two; remember that the life satisfaction question was not asked in wave 11, 2011, so this has been used as the breakpoint in the samples. The differences in the results for overeducation are striking, and suggestions why this might be so are provided after the tables.

[TABLE FIVE ABOUT HERE]

Restricting the sample to 1997-2000 indicates that the relatively overeducated are significantly less satisfied with life than those who are not overeducated. This is the case when the sample is restricted to males (at the 5% significance level) but not when restricted to females, a result consistent with the finding across the whole date range (table 1). As expected and as shown in table 6, the long-run overeducation coefficients are again similar to the short-run coefficients for overeducation in table 5.

[TABLE SIX ABOUT HERE]

Restricting the sample to the later time period 2002-2007, as tables 7 and 8 show, indicates no statistically significant relationship between overeducation and life satisfaction. This general result is maintained when the sample is restricted to females, and also to males. Being overeducated seems to matter less (if at all) for satisfaction with life in this later period.

[TABLE SEVEN ABOUT HERE]

Again, the equivalent long-run coefficients are very similar. As table 8 shows, being relatively overeducated is not significantly associated with life satisfaction between 2002 and 2007.

[TABLE EIGHT ABOUT HERE]

This broad finding is supported with regressions making use of the alternative measure of overeducation: the results for 1997-2000 (not shown) are very similar, with the negative relationship being significant at the 5% level for both males and the whole sample (i.e. both genders), and statistically insignificant for females. For the later years, 2002-2007, the results for all three groups are insignificant, although the p-value for the whole sample is 0.059.

These alternative results are slightly different from those presented above, but support the broad finding that the negative influence of overeducation on life satisfaction has faded over time. While we do not have a reason for this, we speculate that it is a function of increased participation in higher education, and changing expectations. Perhaps students appreciate that as more individuals undertake higher education, a degree is not enough to get a good job (Adnett and Slack, 2007). Perhaps this result reflects a changing norm regarding what is a graduate job too. Also, with more individuals attending university there is perhaps less of a cultural stigma to not being adequately rewarded in the labour market. More people, perhaps, know other people who have a degree but do not (as yet) have a graduate job. Thus the relatively overeducated are less unusual. This suggestion is similar to a finding in the unemployment and unhappiness literature, where being unemployed in a region, with more unemployed people is less damaging to life satisfaction than being in a region with fewer unemployed individuals (Clark 2003). This speculation, if true, provides more support for life satisfaction having strong relative elements: which groups we compare ourselves with and

how we compare to others both matter for subjective well-being. An interpretation that complements the happiness literature and is supportive of the theoretical reasons put forward in section 1 for the negative association of overeducation and life satisfaction.

Extensions to the above analysis were undertaken by interacting overeducation with income and overeducation with education. The education interaction did not result in any additional significant difference between the overeducated and the rest of the employed individuals (output omitted), whereas the income-overeducation interaction generated some interesting differences. Below, in table 9, a summary is presented of the interaction terms for the whole sample used above which includes both genders and the full date range. Column (a) is the results from the regressions discussed above (here from table 1), and column (b) is the same estimation but with the inclusion of the interaction term.¹¹

[TABLE NINE ABOUT HERE]

Overeducation preserves its negative impact on life satisfaction, and income is still insignificantly associated with life satisfaction. However the last row of the B column demonstrates that, for the overeducated income is positively associated with life satisfaction. Income appears to mitigate somewhat the reduced life satisfaction of being overeducated: the interaction between income and overeducation results in a positive coefficient approximately half the size of the negative effect of being overeducated. This finding, based on just the first estimate above (the left column of table 1) is supported by many of the comparisons made with the other estimates. The next two tables present the results for both genders together in the earlier period (1997-2000) and the later period (2002-2007).

[TABLE TEN ABOUT HERE]

¹¹ Tests for the joint significance of overeducation and the interaction term demonstrated that they are jointly significant when they are individually significant in each of the estimates here.

The 1997-2000 results support the main results: positive income effects partly offset negative overeducation effects in the earlier period as well as in the whole sample period (table 9). Also like the main results, there is no such effect in the later period. For males (output omitted), the income-overeducation interaction term is not statistically significant in any of the three time periods indicating no difference between the overeducated and the rest of the employed individuals in the sample with respect to the effect of income (output omitted). For females, the results are interesting. The three tables are below, starting with the full date range sample before the earlier period (1997-2000) and the later period (2002-2007).

[TABLE ELEVEN ABOUT HERE]

For all three estimates, the inclusion of the income-overeducation interaction term results in a statistically significant (sometimes highly so) and negative effect of overeducation on well-being. A result substantially different from those found earlier in this section, and one that suggests that indicates that females are also less satisfied with their life when they are relatively overeducated, an effect attenuated by the income they earn. What makes overeducated females happy with their income, when the effect of income is negative (or insignificant depending on the sample) for all females? One possibility is that when undertaking education (enough to become overeducated) they perhaps had very little money, and on subsequent employment they were very happy with the increase in income they received, even though this is not necessarily any more than colleagues with less education; colleagues who have perhaps been earning money for a longer period of time as a result of not participating in as much post-compulsory education.¹² In the latter period, as well as the

¹² I thank Ilona Ebbers for this suggestion.

overall range, the effect of income for females is (*ceteris paribus*) negative when the interaction term is included. Like before, this may reflect more time away from the family (longer hours at work, more commuting time) as well as a stressful job at higher levels of income. Future research could investigate these possibilities and explore potential happiness-income trade-offs, conditional on other mediated effects.

5 Conclusion

This investigation has presented evidence of a negative association between relative overeducation and life satisfaction for young people, and this was found via an appropriate econometric method. Serial correlation is present in the data, and this needs to be thoughtfully modelled. The method chosen needs to be appropriate, both statistically and economically and it must also be able to give informative results. Careful thought was given before deciding to model the overeducation-happiness relationship via dynamic panel methods and the results demonstrate that there is a negative impact of overeducation in terms of happiness. This result is robust to both the method of measuring relative overeducation, and the choice of instrumentation of the lagged dependent variable within the preferred dynamic panel method. This result was initially found for both genders together and males only, however when the impact of income for the overeducated is controlled females also have lower life satisfaction from being overeducated. In most cases (for both genders) income appears to compensate somewhat this finding of lower life satisfaction for the overeducated (even though the income of the overeducated is not necessarily higher than the income of other individuals).

Overeducation here is an employment based statistical measure based on a relative comparison with other individuals who are not overeducated. This result adds to other results

within the happiness literature which suggest that happiness is, often, based on relative concerns. Also supportive of the relative position theory, further analysis suggests that this phenomenon (overeducation linked with lower life satisfaction) is one that has faded with time, being more prevalent in the past when, we speculate, there may have been a greater stigma associated with education not being rewarded in the labour market. That there are more people who are considered overeducated, perhaps means that being relatively overeducated no longer makes people unhappy. Maybe, with rising participation in HE, the perception has come to be that HE is a necessary but not a sufficient condition for a “graduate” job. If, in the past, HE was perceived as sufficient, then non-achievement of a graduate job may have been more likely to have been a source of unhappiness. Future research may analyse why and whether this is the case.

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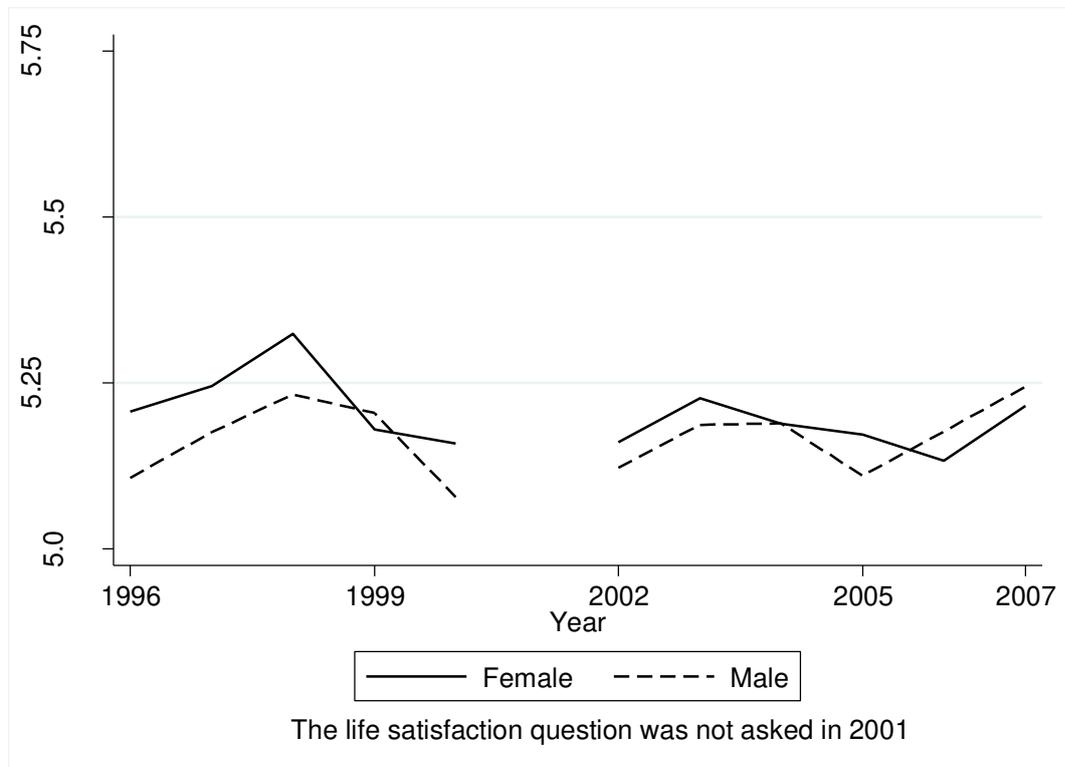
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Figure 1 The incidence of relative overeducation by gender as measured by occupation



Source: own calculations from the BHPS

Figure 2 Average life satisfaction by gender, for young British individuals



Source: BHPS.

Table 1 Life satisfaction and overeducation (measured by occupation), System GMM panel analysis, BHPS.

VARIABLES	All Life Satisfaction	Males only Life Satisfaction	Females only Life Satisfaction
Life satisfaction (t-1)	0.05** (0.023)	0.07** (0.028)	0.06* (0.032)
Years of Schooling	0.01 (0.009)	0.00 (0.012)	0.02* (0.014)
Income	-0.01 (0.067)	0.23*** (0.080)	-0.17* (0.095)
Overeducated	-0.11*** (0.037)	-0.10** (0.049)	-0.09* (0.056)
Married	0.38*** (0.074)	0.31*** (0.095)	0.30*** (0.108)
Separated	0.20 (0.396)	-0.83 (0.661)	0.49 (0.301)
Divorced	0.27 (0.243)	0.16 (0.330)	0.04 (0.227)
Widowed	-2.41*** (0.788)		-1.74*** (0.577)
Health: excellent	0.82*** (0.174)	0.33 (0.215)	1.24*** (0.196)
Health: good	0.36*** (0.141)	0.17 (0.201)	0.67*** (0.170)
Age 20-22	0.09 (0.053)	0.19*** (0.073)	-0.05 (0.072)
Age 23-24	0.06 (0.043)	0.07 (0.059)	0.02 (0.061)
Age 25-26	0.04 (0.033)	0.05 (0.047)	0.01 (0.047)
Wave dummies?	Yes	Yes	Yes
Region dummies?	Yes	Yes	Yes
Constant	4.33*** (0.186)	4.12*** (0.269)	4.18*** (0.258)
Observations	9,857	4,808	5,049
Number of individuals	3,872	1,868	2,004
Number of instruments	416	367	403

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 2 Long-run overeducation coefficients calculated from table 1

	All	Male	Female
Long-run overeducation coefficient	-0.116*** (p=0.003)	-0.110** (p=0.039)	-0.100* (p=0.088)

Table 3 Life satisfaction and overeducation (measured by occupation and industry), System GMM panel analysis, BHPS

VARIABLES	All Life Satisfaction	Males only Life Satisfaction	Females only Life Satisfaction
Life satisfaction (t-1)	0.07*** (0.027)	0.05 (0.040)	0.11*** (0.041)
Years of Schooling	0.01 (0.009)	-0.00 (0.012)	0.01 (0.015)
Income	0.02 (0.084)	0.21** (0.101)	-0.05 (0.143)
Overeducated	-0.08* (0.042)	-0.11* (0.060)	-0.06 (0.063)
Married	0.40*** (0.090)	0.23* (0.123)	0.38*** (0.121)
Separated	0.12 (0.481)	-0.98 (0.700)	0.54 (0.413)
Divorced	0.40 (0.305)	0.43 (0.557)	0.11 (0.243)
Widowed	-2.20*** (0.739)		-1.86*** (0.644)
Health: excellent	0.58*** (0.220)	0.23 (0.229)	0.98*** (0.223)
Health: good	0.17 (0.181)	0.07 (0.183)	0.49** (0.191)
Age 20-22	0.13** (0.061)	0.20** (0.079)	0.03 (0.083)
Age 23-24	0.10** (0.049)	0.07 (0.064)	0.09 (0.070)
Age 25-26	0.09** (0.036)	0.08* (0.050)	0.05 (0.052)
Wave dummies?	Yes	Yes	Yes
Region dummies?	Yes	Yes	Yes
Constant	4.30*** (0.224)	4.33*** (0.336)	3.97*** (0.330)
Observations	7,744	3,832	2,912
Number of individuals	3,382	1,640	1,742
Number of instruments	301	270	292

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 4 Long-run overeducation coefficients calculated from table 3

	All	Male	Female
Long-run overeducation coefficient	-0.088* (p=0.053)	-0.118* (p=0.056)	-0.064 (p=0.359)

Table 5 Life satisfaction and overeducation (measured by occupation), System GMM panel analysis, BHPS 1997-2000

VARIABLES	All Life Satisfaction	Males only Life Satisfaction	Females only Life Satisfaction
Life satisfaction (t-1)	0.06* (0.034)	0.05 (0.058)	0.08 (0.053)
Years of Schooling	0.01 (0.015)	0.01 (0.018)	0.03 (0.023)
Income	-0.18 (0.134)	0.05 (0.155)	-0.28 (0.199)
Overeducated	-0.16** (0.061)	-0.18** (0.081)	-0.13 (0.092)
Married	0.49*** (0.115)	0.35** (0.145)	0.47*** (0.172)
Separated	0.08 (0.718)	-0.63 (0.578)	0.81 (0.692)
Divorced	0.36 (0.360)	0.35 (0.634)	0.22 (0.282)
Widowed	-3.39 (9.472)		-1.05 (6.609)
Health: excellent	0.54** (0.251)	0.06 (0.313)	1.13*** (0.266)
Health: good	-0.00 (0.194)	-0.12 (0.266)	0.41* (0.228)
Age 20-22	0.15* (0.087)	0.18* (0.107)	0.11 (0.123)
Age 23-24	0.13* (0.069)	0.03 (0.090)	0.19* (0.101)
Age 25-26	0.11** (0.051)	0.07 (0.067)	0.14* (0.081)
Wave dummies?	Yes	Yes	Yes
Region dummies?	Yes	Yes	Yes
Constant	4.65*** (0.736)	4.68*** (0.452)	4.104*** (0.912)
Observations	4,312	2,195	2,117
Number of individuals	2,089	1,041	1,048
Number of instruments	178	162	172

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 6 Long-run overeducation coefficients calculated from table 5

	All	Male	Female
Long-run overeducation coefficient	-0.166** (p=0.011)	-0.185** (p=0.027)	-0.137 (p=0.167)

Table 7 Life satisfaction and overeducation (measured by occupation), System GMM panel analysis, BHPS 2002-2007

VARIABLES	All Life Satisfaction	Males only Life Satisfaction	Females only Life Satisfaction
Life satisfaction (t-1)	0.04 (0.028)	0.07** (0.035)	0.04 (0.047)
Years of Schooling	0.02 (0.011)	0.00 (0.017)	0.03* (0.017)
Income	-0.01 (0.081)	0.27** (0.107)	-0.21* (0.110)
Overeducated	-0.07 (0.046)	-0.08 (0.067)	-0.06 (0.065)
Married	0.30*** (0.095)	0.23* (0.126)	0.25* (0.132)
Separated	0.27 (0.379)	-1.30 (1.301)	0.28 (0.374)
Divorced	0.14 (0.307)	-0.26 (0.780)	-0.06 (0.331)
Widowed	-2.18*** (0.566)		-1.90*** (0.523)
Health: excellent	1.04*** (0.210)	0.50** (0.252)	1.29*** (0.269)
Health: good	0.59*** (0.174)	0.44* (0.243)	0.78*** (0.231)
Age 20-22	0.01 (0.067)	0.17* (0.103)	-0.16* (0.088)
Age 23-24	-0.01 (0.055)	0.05 (0.084)	-0.10 (0.072)
Age 25-26	-0.04 (0.043)	0.01 (0.067)	-0.09 (0.059)
Wave dummies?	Yes	Yes	Yes
Region dummies?	Yes	Yes	Yes
Constant	4.15*** (0.222)	3.899*** (0.315)	4.28*** (0.326)
Observations	5,545	2,613	2,932
Number of individuals	2,342	1,096	1,246
Number of instruments	261	228	254

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 8 Long-run overeducation coefficients calculated from table 10

	All	Male	Female
Long-run overeducation coefficient	-0.072 (p=0.136)	-0.088 (p=0.220)	-0.053 (p=0.664)

Table 9 Effects of interacting income and overeducation, System GMM panel analysis, BHPS 1996-2007

	a	B
Income	-0.013 p=0.851	-0.003 p=0.970
Overeducation	-0.11 p=0.003	-0.288 p=0.012
Income.overeducation	-----	0.148 p =0.047

Table 10 Effects of interacting income and overeducation, System GMM panel analysis, BHPS 1997-2000, and 2002-2007

1997-2000	a	b
Income	-0.180 p=0.180	-0.234 p=0.135
Overeducation	-0.156 p=0.011	-0.550 p=0.007
Income.overeducation		0.333 p=0.022

2002-2007	a	B
Income	-0.007 p=0.932	0.030 p=0.750
Overeducation	-0.069 p=0.137	-0.175 p=0.199
Income.overeducation		0.089 p=0.281

Table 11 Effects of interacting income and overeducation, System GMM panel analysis, Females only, BHPS 1996-2007, 1997-2000, and 2002-2007

	a	B
Income	-0.165 p=0.083	-0.189 p=0.037
Overeducation	-0.094 p=0.091	-0.470 p=0.000
Income.overeducation		0.333 P=0.000

1997-2000	a	B
Income	-0.280 p=0.159	0.281 p=0.143
Overeducation	-0.127 p=0.167	-0.484 p=0.038
Income.overeducation		0.361 p=0.041

2002-2007	a	B
Income	-0.210 p=0.056	-0.251 p=0.011
Overeducation	-0.057 p=0.376	-0.491 p=0.001
		0.343 p=0.000