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WHO UPGRADES TO HIGHER LEVEL QUALIFICATIONS IN MIDLIFE?

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ABSTRACT: This paper investigates why people return to study in their 30s and beyond and upgrade to a higher level qualifications. Some previous research has argued that attitudes formed in childhood, via family background and schooling, continue to shape a person's engagement in learning throughout the adult lifecourse. Psychologists distinguish extrinsic motivation, determination to progress in a career; from intrinsic motivation, love of learning and suggest that both may be relevant to participation in adult education. A well-established education literature focuses on barriers to adult learning, such as lack of time or lack of funds.

The research focuses on people who did not enter higher education at the conventional ages of late teens or early twenties but who did subsequently obtain degree-level or equivalent qualifications in midlife, defined here as from their early 30s through to age 50. The research uses data from the 1958 British birth cohort, a large-scale longitudinal survey. In the paper, a comparison group methodology and binary logistic regression models are used to isolate the key factors which explain why certain individuals progress to higher level qualifications in midlife while others do not.

Keywords: Adult learning, qualifications, upgrading, higher education, mature students

1. INTRODUCTION

Adult learning has a role, at least potentially, in addressing social inequality. Those who missed out on gaining accredited qualifications during their school years may be able to catch up in adult life and so there needs to be a focus on so-called second-chance education as well as on initial education. Adult learning also has an economic role and this has become increasingly prominent in fast-changing economic times. Returns to education and retraining are ways in which the skills of workers can be reoriented to changes in occupational structure and the need for new skills. It is not sufficient merely to rely on the gradual entry into the labour force of well-qualified young people as this will be a very long-term process and wastes the potential of the current workforce. As Leitch (2006) argued, 'the power house for the new skills base is amongst people already in employment'. Given that many new jobs are likely to be at graduate level, upgrading qualifications to that level becomes particularly

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relevant. But getting to that level requires significant investment of time and effort, and so it is important to understand the factors which encourage or discourage individuals from upgrading to that level.

This paper analyses the determinants of upgrading to higher level qualifications¹ by adults in their 30s and 40s using information from a major British longitudinal data source. In the next section, we review the literature. Subsequent sections outline the data and methods used and present the results of statistical analysis of qualifications acquisition and upgrading. A final section discusses the implications of the findings.

2. LITERATURE REVIEW

In broad terms, research on adult learning is organised around the concept of barriers to participation – the higher the barriers faced by an individual, the less likely they will be to participate in learning (Boeren, 2016; Johnson *et al.*, 2009; Keep, 2009). Two types of barriers can be distinguished. First, there are situational barriers such as costs, lack of time and the absence of relevant provision. Second, there are motivational and attitudinal factors, such as lack of confidence and negative feelings about education, which may prevent someone from beginning or progressing in a course of study.

Among the situational barriers, some research has found evidence that adults in work are more likely to participate in vocational training than unemployed or economically inactive people (Aldridge and Tuckett, 2007; Fitzgerald *et al.*, 2002). This is simply because workers are often much more likely to have access to skill-development opportunities than people who are not in work (O'Connell, 1999). How the type of work affects the likelihood of participating in training is not so well established in the literature. There is some evidence that part-time workers can be less likely to have access to work-related training (Almeida-Santos and Mumford, 2005; Arulampalam and Booth, 1998; Boheim and Booth, 2004). This could be because part-time jobs are more likely to be low skilled or badly rewarded and hence less likely to provide training opportunities. On the other hand, part-time workers could have more time to pursue their own skills development than those in full-time employment. Certain types of employer are more likely to provide vocational training, some of which will lead to qualifications. People working for larger employers (Arulampalam and Booth, 1998; Green *et al.*, 1999; Hughes *et al.*, 2004) and/or in workplaces that are part of a larger multisite organisation (Almeida-Santos and Mumford, 2005; Boheim and Booth, 2004) are more likely to have access to skill-development opportunities. Traditionally, at least, there has been a strong ethos of training in many parts of the public sector. Hence, evidence suggests that public sector employees may have greater opportunities for work-related training (Green *et al.*, 1999; Murphy *et al.*, 2007). Family care responsibilities may be a further component of the situational barriers to learning. The presence of children, especially young

children, in the household places limits on the time and energy that adults need in order to study (Swain and Hammond, 2011). A supportive partner, implying shared earnings and/or childcare responsibilities, could reduce barriers of this type (Arulampalam and Booth, 1998; Green *et al.*, 1999).

Attitudinal barriers to study may arise in a number of ways. A consistent theme in the adult education literature is that determinants of participation may have long-term antecedents rooted in family background and schooling (McGivney, 1990). Patterns of participation in formal education, it is argued, are determined to a considerable extent by variables such as gender, social class, initial schooling and parental attitudes to learning. Certain individuals, early in life, create an identity for themselves inimical to study and are therefore very unlikely to participate in formal educational activities beyond compulsory schooling (Gorard and Selwyn, 2005). A very important predictor of participation in adult learning, therefore, is previous experiences of education, with more positive experiences predicting participation later in life (Hammond and Feinstein, 2006). Previous studies have shown that early attainment test scores in childhood are related to highest qualification level achieved by midlife (Von Otter, 2014) and the probability of low-skilled adults obtaining a qualification in midlife (Sabates *et al.*, 2007).

Some of the literature has distinguished different types of motivation that people may have for engagement in adult learning. A fundamental distinction can be made between extrinsic motivation, which is focused on reward, and intrinsic motivation, the enjoyment of studying for its own sake, as motivations for learning (Eccles *et al.*, 1998). Qualitative research on mature, part-time, adult learners in HE (Osborne *et al.*, 2004; Swain and Hammond, 2011) shows that some learners had mainly extrinsic reasons for studying, such as to improve future employment options, a new job or career change, while others had mainly intrinsic reasons such as pursuing an interest in a specific subject, enjoyment of a topic or intellectual stimulation.

The links between a child's own aspirations and expectations and educational outcomes in childhood and early adulthood such as staying on beyond compulsory school-leaving age and attending university are well established (Khatab, 2015; Schoon *et al.*, 2007). There is also a good deal of evidence that parental expectations and aspirations influence these outcomes of initial education (Khatab, 2015). Whether parental aspirations continue to play a role on later adult participation in learning is not well established, but there is some evidence to suggest that it may do so (Von Otter, 2014). For instance, Sacker and Schoon (2007) report that parental expectations and parental aspirations were associated with highest qualification ever obtained by people in their early 40s.

Considering the existing literature on adult participation in education in the round, it can be observed that it has some strengths and some limitations. The main strength is in the range of small-scale, qualitative studies which focus on mature learners in HE (Burton *et al.*, 2011; Davies and Williams, 2001; Fuller, 2007; Osborne *et al.*, 2004; Swain and Hammond, 2011). These are, of course, of

considerable value in exploring the experiences of particular learners in some depth and detail. The limitations are, first, that the focus is solely on participants and we therefore lack information on the reasons for non-participation (Fuller *et al.*, 2008). And second, the qualitative nature of the literature makes it problematic to draw out the kind of general conclusions which might be obtained from large-scale quantitative surveys. Quantitative work needs to have a longitudinal orientation if it draws out the educational ‘trajectories’ which people follow and resolve the extent to which motivations to learn and participation in adult learning are affected by family background and experiences in initial education (Field *et al.*, 2009). In other words, it is not only current life stage and circumstances that can influence motivations to learn but also past experience (Gorard and Rees, 2002). Cross-sectional data may lack this prior information entirely (White, 2012) or else have to rely on crude proxies for family background and other important factors (Cincinnati *et al.*, 2016). The research to be undertaken in this paper therefore draws on longitudinal data which can both track changes over time and relate outcomes in adult life to a range of antecedents in childhood and youth.

3. DATA, METHOD AND MEASUREMENT

Data

Data from the 1958 British birth cohort, also known as the National Child Development Study (NCDS), were utilised for this research. The NCDS began as a survey of perinatal mortality and comprised all births in a single week in Britain in 1958. Follow-up surveys were conducted at various times including when cohort members were aged 7, 11, 16, 23, 33, 42 and 50. The value of the NCDS lies primarily in the availability of information about the lifecourse of cohort members so that outcomes by age 50 can be related to circumstances in early life.

In 1978, exam results were gathered from all the schools attended by cohort members about the qualifications which they had obtained up to that point. This ‘Exams File’ provides objective information about qualifications obtained by the end of compulsory schooling at age 16 and in the 4 years immediately after that. Each wave of the NCDS in adulthood (from wave 4 at age 23 onwards) has asked respondents for quite detailed information about the qualifications they have acquired, usually since the previous wave. This information was used to map qualifications obtained, and the highest level of qualification, of respondents at ages 16, 23, 33, 42 and 50. The qualifications obtained by cohort members were coded to six levels, where each level is defined in terms of equivalency with National Vocational Qualifications (NVQs):

- 0 = No qualifications
- 1 = NVQ Level 1 or equivalent, low-grade GCSEs or 0 Levels
- 2 = Qualifications at 0 Level or GCSE A–C grade, NVQ Level 2 or equivalent
- 3 = A level(s), NVQ Level 3 or equivalent

4 = Degree, NVQ Level 4 or equivalent

5 = Higher degree, NVQ Level 5 or equivalent.

For a detailed description of the NVQ qualification levels, see Makepeace *et al.* (2003). The number of cases for which a full qualifications profile through to age 50 could be constructed was 8939, or over 90% of all the cases present in the age 50 wave of the NCDS. Non-response to the question on qualifications could be a problem if it occurs systematically for individuals with similar characteristics. Explanatory variables were selected on the basis of prior research and relevant theory in the field of adult education. There is a rich set of variables within the NCDS upon which to draw. These include family background variables, experience of school, engagement in various forms of learning after school and, finally, contextual barriers to progression.

Variables used in the analysis

Outcome

The outcome is whether a cohort member upgraded to a Level 4 qualification between the ages of 33 and 50. The outcome is coded 1 for individuals who did upgrade between these ages and 0 otherwise. This is the definition of acquiring 'higher level qualifications' used throughout the paper.

The explanatory variables used in this study included family background, childhood and schooling, aspirations and expectations, engagement with learning in early adulthood and the cohort member's situation at age 33. Taking each group of variables in turn, the details are as follows:

Origin variables

Gender. This variable was coded 0 for males and 1 for females.

Social class of origin

The measure in NCDS is for the social class of the father as measured by the Registrar General's 6-point scale: I professional; II managerial and technical; IIINM skilled non-manual; IIIM skilled manual; IV semi-skilled and V unskilled (Leete and Fox, 1977). This was recoded making a simple binary distinction between those whose fathers were unskilled or semi-skilled manual (coded 1) and all those who were not in this group (coded 0).²

Educational background of cohort members' mothers and fathers

Mother's education. Mother's education was coded as 0 left school at the minimum leaving age or 1 if left school after the minimum leaving age.

Father's education. Father's education was coded as 0 left school at the minimum leaving age or 1 if left school after the minimum leaving age.

We also experimented with a combined variable which took the value 1 if either mother or father stayed in education beyond the minimum age, and 0 otherwise.

Age father left education. Coded 1 for left at age 15 or earlier, 2 for age 16, 3 for age 17 and above.

Age mother left education. Coded as for father.

Childhood and schooling

At age 11, cohort members attempted several tests including tests in reading, maths and a general ability test (Douglas, 1964). These three variables were combined using principal components analysis and the first principal component was taken as a summary measure of academic achievement by age 11.

Free school meals. Whether any member of family received free school meals when cohort member was 11 years old.

Type of school. This is a 4-point scale distinguishing type of secondary school attended: comprehensive, grammar, fee-paying and secondary modern.

School motivation. The cohort members completed an academic motivation scale consisting of eight items measured on a 5-point Likert scale. Summed scores range from 0 to 32, with higher scores representing greater motivation to study at school.

Interest in reading. How often reads, measured at age 16. Responses were no chance, hardly ever, sometimes, often.

School disengagement. A measure of disengagement from school at age 16. A score based on three items – whether cohort member wishes could have left school at 15, whether agrees children should stay away from school, whether played truant this year.

Parental interest in education. Head teachers were asked how much interest each parent showed in their child's educational progress. Parental support was coded on a 3-point scale, (I) very interested, (II) some interest and (III) little or no interest.

Aspirations and expectations

Parental aspirations. Parental aspirations are coded, (I) wishes child to leave at 16 years, (II) hopes child continues full-time education to 18 years and (III) hopes child continues full-time education after 18 years.

Parental expectations. Parental expectations are coded, (I) expects child to leave at 16 years, (II) expects child to continue full-time education to 18 years and (III) expects child to continue full-time education after 18 years.

Educational aspirations. Cohort members own aspirations were coded, (I) no wishes for GCE A level or Scottish Higher level exams, (II) uncertain about wishes and (III) hopes to study for GCE A level or Scottish Higher exams.

Educational expectations. Cohort members' expectations were coded, (I) expects to leave at 16 years, (II) expects to continue full-time education to 18 years and (III) expects to continue full-time education after 18 years.

Career aspirations at age 16. Coded 1, if the cohort member aspired to professional or managerial job at age 16, 0 otherwise.

Engagement with learning in early adulthood

To measure courses taken in early adulthood (by age 23) and between ages 23 and 33, five binary variables were constructed:

- (1) One or more vocational courses between leaving school and age 23.
- (2) One or more courses for interest between leaving school and age 23.
- (3) Any courses leading to qualifications between the ages of 23 and 33.
- (4) Any work-related courses lasting 3 days or more between ages 23 and 33.
- (5) Any courses undertaken for interest between the ages of 23 and 33.

Situation at 33 and barriers to learning

Whether had a disability or long-term illness by age 33.

Whether had a partner at age 33.

Number of children at 33, with categories none, one, two, three or more.

Occupational group at age 33, with four categories: professional/managerial, skilled non-manual, skilled manual and semi- or unskilled manual occupation. This was based on current job for those who had one and most recent job for those who were not in work at 33.

Employment status at age 33: working full-time, part-time or unemployed/out of the labour force.

Employed in the public sector at age 33.

Working for an organisation with 500 or more employees at age 33.

Method

In order to identify the key variables which may have an impact on the outcome of interest, it is helpful if the groups being compared are as similar as possible in other respects (Gelman and Hill, 2007, p. 200). In this paper, a comparison group methodology was utilised. The aim was to identify the factors associated with people upgrading to higher level (Level 4) qualifications between the ages of 33 and 50. Now the overwhelming majority, almost 85%, of the people who did accomplish this were either at Level 2 or 3 by age 33. The comparison group was therefore constructed as those who were also at Level 2 or 3 by age 33 but did not upgrade to Level 4. So people who had no qualifications or only very low-level qualifications by 33 (i.e. were at Level 0 or Level 1 in the qualifications hierarchy) were not included in the comparison group because they were very unlikely to reach Level 4 by the age 50. Those who already had Level 4 qualifications before age 33 were also excluded because they are in a very different position to people trying to upgrade to Level 4 in midlife. All of these cases were removed entirely from the analysis. In other words, the sample was trimmed down to the most relevant cases so as to be able to make a more focused comparison. The remaining sample comprised 4475 cases – 726 of whom did upgrade to a Level 4 qualification and 3749 who did not. The key question then is – what were the distinguishing characteristics of those who upgraded to higher level qualifications in midlife compared to a group who seemed quite similar at 33 but, as it turned out, did not obtain higher level qualifications by age 50?

To address this question, regression analysis was used. This is a standard way of examining how a set of explanatory variables are related to a response variable of interest. There are various types of regression analysis and their appropriateness depends on the form of the outcome variable. Some outcomes are measured on a continuous scale and multiple linear regression would be the appropriate regression technique here. But in this research, the outcome of interest is binary. It is coded 1 for those who did upgrade to higher level qualifications and 0 for those who did not. Hence, an appropriate form of analysis is binary logistic regression. This approach analyses the impact of explanatory variables on the probability that the outcome occurred.

Missing data on certain items are a common problem in large-scale survey analysis, exacerbated by the process of attrition (dropout) in longitudinal studies. Since the data used in this study were from multiple waves of a birth cohort survey, missingness was an issue that needed to be addressed. Imputation methods adopt the approach of ‘filling in’ missing values with plausible predicted values. This allows the analyst to construct larger data sets, and therefore to identify statistical relationships and possible causalities with greater confidence, rather than ‘losing’ cases (and analytic power) as a result of partially missing data. Various ways of performing the imputation have been suggested. Unfortunately, simple approaches such as incorporating dummy variables for missingness or assuming that anyone with missing data on a variable can be assumed to take the mean score on that variable (mean value imputation) turn out

to be biased and may therefore be worse than doing nothing about missingness (Enders, 2010). The basic problem with these single imputation approaches is that the subsequent analysis does not ‘know’ that certain values have been imputed and so treats all values as true values. It does not allow for the uncertainty in the missing values.

A better alternative is multiple imputations, widely regarded as a methodologically sound approach to addressing the problem of missing data (Allison, 2002; Enders, 2010). In multiple imputations, the process of filling in missing values is carried out several times to create a multiple set of completed data sets, i.e. ones with no missing values. These completed data sets are then used for the analysis of the research question of interest with results from each data set combined in an appropriate way – using a set of rules for combining results known as ‘Rubin’s rules’ named after the person who developed them (Rubin, 1987). There are, broadly, two approaches to the imputation step here. One approach is to create multiple imputations assuming a large, joint model for all of the variables, typically multivariate normality. The other approach is called imputation by chained equations. This approach cycles through each variable modelling each one conditional on the others. It works through a number of iterations for each complete data set until convergence is achieved, e.g. it might take 10 of these iterations to construct one imputed version of the data set.

Since in the analysis to be conducted many of the variables – including the response – were binary or categorical, multivariate normality seemed implausible and so the chained equations approach was preferred. To improve the precision of the imputation, several auxiliary variables, over and above those included in the substantive regression analyses, were utilised. Variables which appeared to help in predicting participation in adult learning were included as were variables which predicted dropout from the sample. Previous work on NCDS, notably Carpenter and Plewis (2011), was used to guide the choice of variables.

There has been some debate in the statistics literature about the appropriate number of completed data sets to construct under multiple imputations. Enders (2010) recommends creating a substantial number, at least 20, completed data sets. In this analysis, 50 imputed data sets were created and all the analyses were run on each data set separately and then combined.³

With many explanatory variables to choose among, the process of selecting the preferred model was not a simple one. In order to ensure that the final model was interpretable and plausible, as well as a good fit to the data, it was decided not to use automated selection procedures but to allow the choice of model to be determined by the researcher. The process of selecting the model followed the steps described in Collett (2003). At the first stage, simple logistic regression models, which are containing only one explanatory variable, were run. Likelihood ratio tests were run to establish which variables were at least weakly statistically significant ($p < 0.2$) in the absence of any other variables. At the second stage, all variables which passed this first-stage check were entered into a multiple logistic regression. In this

framework, some variables which were significant at stage one were no longer so, and these variables were removed one at a time until a parsimonious model containing only significant terms was obtained. At the fourth stage, further tests were carried out to check whether any of the variables dropped at an earlier stage was significant and, if so, they were readmitted to the model.

4. RESULTS

About 16% of the sample (726 of 4475 cases) upgraded to a Level 4 qualification between the ages of 33 and 50. Women were more likely to so than men with almost a fifth of women upgrading compared to about one in eight of the men. Those from poorer backgrounds were *more* likely to upgrade to Level 4 in midlife (given that they had not done so earlier, of course) with those in semi-skilled and unskilled manual social class of origin, and those who had received free school meals being more likely to do so. A full set of descriptive statistics is shown in the Appendix. It is also noteworthy that those whose parents had expected them to continue in full-time education beyond 18 were more likely to upgrade in midlife, as were those who had high career aspirations at age 16. There was little evidence in the descriptive statistics that measures of motivation or engagement at school were associated with this outcome of upgrading in midlife but there was a strong association with having obtained qualifications between the ages of 23 and 33.

Turning to the regression analysis, a final, preferred, model – the culmination of the model selection process outlined in the Method section – is shown in [Table 1](#).

The results of logistic regression models can be expressed in the form of odds ratios and this is how they are shown in [Table 1](#). It can be inferred, for instance, that women were more likely than men to upgrade to higher level qualifications between the ages of 33 and 50 and that the odds were some 42% greater for women accomplishing this than men, other things being equal. Similarly, those whose fathers were in the unskilled or semi-skilled manual social class groups at birth had odds about 41% greater than those whose fathers were not in these social class groups.

Parental expectations and aspirations for staying on in school were entered into the models, as were the cohort members' own aspirations and expectations. Only parental expectations were significant in the presence of other variables and it was this variable which was therefore retained in the final model. As shown in [Table 1](#), those cohort members whose parents expected them to stay in full-time education beyond age 18 but who had not obtained a Level 4 qualification by age 33 were significantly more likely to do so between the ages of 33 and 50 than those whose parents had expected them to leave at 16 (the reference category). Cohort members who, at age 16, wished to have a professional or managerial career were more likely to gain higher level qualifications in midlife, between the ages of 33 and 50, than those who did not aspire to a professional or managerial career when surveyed at age 16.

TABLE 1: Estimates from a logistic regression model for whether attained a Level 4 qualification in midlife (not having done so before)

	Odds ratio	95% Confidence interval for odds ratio
Female	1.421**	(1.137, 1.775)
Father's social class was semi- or unskilled manual	1.412***	(1.162, 1.716)
Parental expectations for child's education (at age 16)		
Uncertain	1.178	(0.804, 1.727)
Full-time education to age 18	0.917	(0.716, 1.174)
Full-time education beyond age 18	1.352*	(1.053, 1.737)
CM's career expectations at age 16 – professional/managerial	1.260	(0.999, 1.590)
Courses leading to qualifications between ages 23 and 33	2.541***	(2.125, 3.039)
Vocational training course between ages 23 and 33	1.440***	(1.186, 1.748)
Did course(s) for interest between ages 23 and 33	1.512***	(1.259, 1.815)
Number of dependent children at age 33 (base is one)		
None	1.032	(0.787, 1.353)
Two	1.007	(0.776, 1.307)
Three or more	1.392*	(1.022, 1.897)
Occupational class at age 33 (base is skilled manual)		
Professional/Managerial	1.421**	(1.091, 1.850)
Skilled non-manual	1.080	(0.820, 1.421)
Semi or unskilled manual	1.435*	(1.064, 1.936)
Economic activity at age 33 (base is full-time work)		
Part-time work	1.359*	(1.039, 1.777)
Unemployed or out of the labour force	1.279	(0.978, 1.672)
Working in public sector at 33	1.338*	(1.071, 1.672)
Observations in data set	4475	
No of imputed data sets	50	

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$. Notes: Estimates are for a logistic regression model with results combined from 50 imputed data sets. Results are reported in the form of odds ratios (exponentiated coefficients); 95% confidence intervals for the odds ratio in brackets.

Engagement in learning in early adulthood, from age 23 up to 33, had a very strong positive impact on the probability of gaining a higher level qualification between the ages of 33 and 50. All types of learning were important but having obtained some qualification between 23 and 33 had the largest effect. Those in the public sector and those working part time, both measured at age 33, also tended to have higher probabilities of upgrading to a Level 4 qualification in midlife. Among occupational class categories, those who were working in skilled manual occupations at age 33 were less likely to upgrade to higher level qualifications in midlife. Having three or more children by age 33 made it more likely that people would subsequently upgrade to a higher level qualification. This is consistent with them being held back by family care barriers in their 20s which would have lessened as children grew older.

To facilitate understanding of the size of the effects of the explanatory variables on the likelihood of upgrading to higher level qualifications between the ages of 33 and 50, some predicted probabilities were calculated. These are shown in [Table 2](#). The starting point is a baseline case. This person is supposed to be female and at the age of 33 was working full time in the private sector in a professional or managerial role, and she did not have any children by age 33. The notes under [Table 2](#) set out the full list of the baseline case characteristics. Such a person would be predicted by the model set out in [Table 1](#) to have a predicted probability of 0.141, or just over 14%, of upgrading to a higher level qualification between the ages of 33 and 50. If instead, this person happened to be male, and all other characteristics were unaltered, then the predicted probability would fall to 0.104. If the person was male, and a skilled manual worker, then the probability would fall further to just 0.075 or not much more than half the probability of the baseline case. If we revert to our baseline case but now suppose that she was not in work at 33, or in part-time work at that time, then the predicted probabilities would increase to 0.174 and 0.181, respectively. These, and a few other examples, are set out in [Table 2](#). Mostly, if just one characteristic of the baseline case is altered, then that would move the predicted probability up or down, depending on what the change is, by about 3 or 4 percentage points. However, if the baseline case is altered to just allow the case to have obtained a qualification in early adulthood, from ages 23 to 33, then the predicted probability rises substantially from about 14% to about 29%. In the last two rows of [Table 2](#), there is information on the impact on the probability of multiple favourable or unfavourable factors. The favourable factors were being in the public sector, undertaking several types of learning in early adulthood (between ages 23 and 33), including gaining a qualification and aspirations at 16 for a managerial or professional career. Someone who had all of the favourable characteristics would have a predicted probability of gaining a higher level qualification between 33 and 50 of 0.67. In other words, these favourable characteristics, taken together, raise the predicted probability to about two-thirds, compared to the probability for the baseline case of approximately one in seven. Conversely, for the combination of multiple unfavourable characteristics reported

TABLE 2: Predicted probabilities from the final model

	Change compared to baseline	Predicted probability	Change in predicted probability
1	None	0.141	0.000
2	Male	0.104	-0.037
3	Male and skilled manual work at age 33	0.075	-0.066
4	Not in work at age 33	0.174	+0.033
5	Father's social class was unskilled manual	0.189	+0.048
6	Works in public sector at age 33	0.181	+0.040
7	Works part-time at age 33	0.183	+0.042
8	Aspirations for high status career (at age 16)	0.172	+0.031
9	Obtained a qualification between 23 and 33	0.295	+0.154
10	Three or more children by age 33	0.182	+0.041
11	Parent expected child to stay in education beyond 18	0.160	+0.019
12	Multiple favourable	0.672	+0.531
13	Multiple unfavourable	0.054	-0.087

Notes: The 'baseline' case is assumed to be female, father's social class was non-manual, parental expectations for the child's education at 16 were uncertain, the cohort member had no children by age 33, was working full-time in a professional or managerial job at age 33, was employed in the private sector at 33. She did some vocational training between ages 23 and 33; she had not had aspirations for a professional or managerial job at age 16. This baseline case has a predicted probability of the outcome, gaining a higher level qualification between the ages of 33 and 50 of 0.141, i.e. just over 14%. The 'multiple favourable' case is assumed to be working part time in the public sector at 33; to have done all three types of learning between 23 and 33 (gaining a qualification, vocational training and courses for interest), her father's social class is assumed to have been unskilled manual, and she had aspirations at age 16 for a professional/managerial career. Otherwise, her characteristics were the same as the baseline.

The 'multiple unfavourable' case is assumed be working full time in the private sector at 33, did no learning of any kind between 23 and 33; father's social class was non-manual; she did not have professional/managerial career aspirations at 16 and was in a skilled manual job at 33. Otherwise, her characteristics were the same as the baseline.

in Table 2, then the predicted probability of the outcome would be only just over 5%, or about 1 in 20.

Academic and vocational qualifications

So far, the analysis has examined those who upgraded to some Level 4 qualification compared to those who did not. But it is also of interest to consider the types of qualification gained. The breakdown of qualifications gained is listed in Table 3.

The first two rows in the table are qualifications obtained in higher education – so the more academic qualifications, probably – while the remaining seven rows contain vocational qualifications. It can be observed that just under 40% of those who upgraded to Level 4 did so via an HE qualification while 61% obtained a vocational qualification at Level 4. What then were the determinants of gaining one sort of Level 4 qualification rather than the other? This question was answered by coding the HE qualifications as 1 and the vocational qualifications as 0 and running some further binary logistic regression models. As before, these estimates were obtained from imputed data and a sequential process of removing non-significant variables was undertaken so as to arrive at a preferred final model. This is reported in Table 4.

Among the 726 cases who upgraded to Level 4 in midlife, those cohort members who attended grammar schools were more likely to obtain HE qualifications rather than vocational qualifications. This could reflect the academic ethos of grammar schools or it could be a proxy for academic ability (although early attainment test scores were not significant and were therefore removed from the model). Strong parental interest in education was also associated with the upgrading to Level 4 HE qualifications rather than vocational ones. Those

TABLE 3: *Details of the qualifications gained by cohort members who upgraded to Level 4 between the ages of 33 and 50*

Qualification	<i>N</i>	%
Degree	160	22.0
HE diploma or certificate	125	17.2
Teaching qualification	120	16.5
Professional (degree-level) qualification	91	12.5
NVQ (Level 4 or above)	78	10.7
HNC/HND	72	9.9
Nursing/Paramedic qualification	41	5.7
BTEC or city & guilds (higher level)	28	3.9
RSA (higher level)	11	1.5
Total	726	100.0

NVQ: National vocational qualification.

TABLE 4: Binary logistic regression for type of Level 4 qualification obtained by midlife learning

	Odds ratio	95% Confidence interval for the odds ratio
<i>Type of school (base is comprehensive)</i>		
Grammar	1.947*	(1.167, 3.249)
Fee paying	0.997	(0.473, 2.104)
Secondary modern/other	1.125	(0.777, 1.626)
<i>Parental interest in education (base is little or no interest)</i>		
Very interested	1.829*	(1.060, 3.155)
Some interest	1.449	(0.830, 2.531)
Courses leading to qualifications, taken between ages 23 and 33	1.584**	(1.138, 2.205)
Course for interest taken between ages 23 and 33	1.493*	(1.070, 2.082)
<i>Number of children at age 33 (base is one)</i>		
None	2.740***	(1.581, 4.751)
Two	1.700	(0.998, 2.896)
Three or more	1.794	(0.987, 3.263)
<i>Economic activity at age 33 (base is full-time work)</i>		
Part-time work	1.630*	(1.074, 2.475)
Unemployed/Out of labour force	2.200***	(1.426, 3.392)
Observations	726	

$F(12, 81,567) = 3.95$; $p < 0.001$. Notes: Estimates are for a logistic regression model with results combined from 50 imputed data sets. For the outcome, academic (higher education) qualifications were coded 1 and vocational qualifications coded 0. Results are reported in the form of odds ratios (exponentiated coefficients); 95% confidence intervals for the odds ratio in brackets.

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

who had taken courses in their 20s – both courses leading to qualifications and courses undertaken out of interest, but not training courses – were more likely to gain HE qualifications in midlife. Those who had no children at age 33 and those who were in part-time work or unemployed/out of the labour force were more likely to upgrade to HE qualifications rather than vocational ones between the ages of 33 and 50. This may reflect a greater investment of time required to get a degree which will be more difficult for those with heavy family commitments or a full-time job. In these analyses, the sample is quite a small subgroup of the NCDS cohort, just 726 cases. Hence, the confidence intervals in Table 4 are often quite wide but the variables discussed were all significant at least at the 5% level.

5. DISCUSSION AND CONCLUSIONS

The NCDS cohort had received their schooling in a period of considerable change in the UK education system, notably the expansion of the comprehensive system and the raising of the school-leaving age. At age 16, in 1974, some 59% of the cohort attended comprehensive schools, 10% grammar schools and 22% secondary modern schools (Bynner and Fogelman, 1993). The school-leaving age had been raised to 16 in 1973 so that the cohort was part of the first-year group required to remain in school for an additional year. Two-thirds of males and 60% of females left education at the age of 16 (Makepeace *et al.*, 2003). Later, cohorts would be much more likely to embark on further and higher education after compulsory schooling. Just over a fifth of the men in NCDS, but a negligible proportion of the women, entered an apprenticeship after leaving full-time education. This is the background against which acquisition of qualifications in adulthood by the 1958 cohort can be understood.

Analysis of NCDS data has revealed that substantial numbers of adults gained new qualifications in their 30s and 40s (Jenkins, 2017; Sabates *et al.*, 2007). The results in this paper show that some 12% of those at Level 2 and 18% of those at Level 3 at age 33 had upgraded to higher level (Level 4 and above) qualifications by the age of 50. Many of the qualifications gained were vocational, suggesting that career development was a key motivation for study. The NCDS sample was competing with more recent cohorts who had tended to stay in initial education for longer, and who therefore had a greater likelihood of proceeding to university and obtaining higher level qualifications by their early 20s. So it seems plausible that adult education was important for the 1958 cohort to catch up with the qualifications of their younger counterparts.

There have been major changes in the types of skills in high demand in the labour market since this cohort left initial education (Smith, 2009). The years since then have seen growth in service sector employment accompanied by a decline in manufacturing jobs and in unskilled work of all kinds. Long-term employment within the same organisation has become increasingly uncommon and workers have recognised the need to develop new skills throughout their

careers. In Britain, the proportion of jobs requiring graduate qualifications rose from 10% in 1986 to 26% by 2012, while jobs requiring no qualifications declined from 38% to just 23% over the same period (Felstead *et al.*, 2013). Changes in the demand for skills since they left school might well have motivated members of the cohort to seek additional qualifications. Both carrots and sticks have been in operation – the risk of losing jobs, particularly unskilled or low skilled jobs, but with growth in demand for more skilled opportunities which may well have given people the incentive to gain new qualifications and upgrade to higher levels.

Economic and social change since the 1970s had opened up opportunities for many people including some of those disadvantaged in initial education by class and/or gender inequalities (Fuller, 2007). There was evidence that some individuals from relatively disadvantaged social backgrounds had been able to make progress in upgrading to higher level qualifications in midlife. Among our sample, people from unskilled and semi-skilled manual backgrounds were more likely to upgrade to higher level qualifications than those who were from skilled manual or non-manual social class backgrounds. Presumably, many of those from more advantaged backgrounds who were able and motivated to gain higher level qualifications, including degrees, would have done so before they reached the age of 33.

Women were also more likely than men to upgrade to higher level qualifications in midlife. Of the 726 cohort members in our sample who did so, over 60% were female. Women had been less likely than men to have acquired intermediate vocational qualifications in their 20s. Large numbers of men in this cohort entered apprenticeships after compulsory schooling and this provided them with opportunities to gain vocational qualifications. In large part because of this, the surveys of the cohort which took place at ages 23 and 33 showed that men were more likely to have acquired intermediate-level vocational qualifications in their late teens and in their 20s. Women with family care responsibilities were particularly unlikely to have obtained these qualifications then (Bynner and Fogelman, 1993; Makepeace *et al.*, 2003). So it seems that sizeable numbers of women who had the ability and potential to obtain intermediate, and subsequently higher level, qualifications did not do so in early adulthood but took the opportunity to catch up later on, in their 30s and 40s.

In the review of literature, attitudinal factors, and the extent to which they were formed in childhood and by schooling, were highlighted. A distinction often drawn in the literature is that between intrinsic and extrinsic motivation. One of the key advantages of birth cohort studies is that they contain data which can be used to investigate how experiences and attitudes formed in early life can be related to outcomes later on. Here, the interest was in whether schooling, motivation and attainment in childhood influenced the likelihood of obtaining higher level qualifications in midlife. One notable finding was that career aspirations measured at age 16 were related to gaining higher level qualifications in midlife. Those who, in the age 16 survey, stated that they aspired to a

managerial or professional job were significantly more likely to upgrade to a Level 4 qualification between the ages of 33 and 50 than those who did not aspire to such a job at age 16. This makes good sense given that many of the qualifications obtained in midlife were vocational. Some previous research has suggested that attitudes towards school and attitudes towards learning formed in childhood continue to play a major role in participation in learning decisions in adulthood (Gorard and Rees, 2002). Little evidence was found to support this. A variable summarising the extent to which, at age 16, cohort members enjoyed school was not significantly related to gaining higher level qualifications in midlife. Neither were measures of school disengagement or extent of interest in reading at age 16. These results suggest that extrinsic motivation, aspirations for a career, was of more importance than intrinsic motivation, in terms of attitudes towards reading and school. Early attainment, as measured by tests taken at age 11, was also eliminated during the model selection process as it was not significantly associated with gaining higher level qualifications between the ages of 33 and 50. In interpreting this result, it is important to bear in mind that in this paper we are only looking at a subset of the whole NCDS cohort and focusing on a particular level of attainment. Looking more broadly, e.g. on the level of highest qualification attained by ages 23 or 33 across the whole cohort, clearly shows that these early attainment test scores were of importance there (Makepeace *et al.*, 2003).

The variable measuring whether cohort members attained a qualification between the ages of 23 and 33 was the single biggest predictor of whether they upgraded to a higher level qualification between 33 and 50. Other forms of learning by cohort members in their 20s and early 30s were also strongly and significantly associated with upgrading to a higher level qualification between 33 and 50. This indication that learning leads to further learning is consistent with a range of previous evidence including some work specifically on birth cohort studies (Jenkins *et al.*, 2003). It is clear that some people moved onto a pathway where they were actively engaged in learning by their 20s and then continued to participate, and to gain further qualifications, as they grew older. This finding, which suggests that once people engage in learning leading to qualifications, they are likely to build on that experience, is relevant to education providers and policymakers.

As for the various situational factors discussed in the Literature Review section, it was also found that the work situation at age 33 was associated with the probability of gaining higher level qualifications. Part timers were more likely than full timers to accomplish this outcome, while those in skilled manual posts were also less likely to do so. Those who were either unemployed, out of the labour force altogether or in part-time work were more likely to upgrade to higher level qualifications between the ages of 33 and 50 relative to people in full-time work. It has been argued that those in precarious positions in the labour market – such as the unemployed, those in part-time work and women who have taken time out of paid work to look after children – will be more likely to

participate in learning and training (Elman and O’Rand, 1998; Jenkins, 2006). Those in stable careers may have less incentive to participate in learning and those in full-time work will also have less time for the intensive study required to gain new qualifications.

6. DISCLOSURE STATEMENT

No potential conflict of interest was reported by the author.

7. NOTES

- ¹ By ‘higher level qualifications’ is meant qualifications which are either at university level (degrees or higher education certificates) or vocational qualifications regarded as being at a similar level in the hierarchy of qualifications. See the Data section for a full definition.
- ² The decision to use the binary variable, rather than a 6-point scale, was based on preliminary exploration of the data which showed that the main differences in terms of proportions gaining higher level qualifications were between these two groups with very little difference within the two groups.
- ³ Note, it is not a simple matter to include interactions in a multiply imputed data set since the interactions must be chosen in advance of the imputation process and included as part of it, in order to avoid bias (Allison, 2002, pp. 50–52). This research investigated some interactions by gender but the results were not significant and are not presented here. The focus here is just on main effects. There may well be scope for future research to explore further potential interactions among some of the explanatory variables.

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9. APPENDIX: DESCRIPTIVE STATISTICS

TABLE A1: Percentage upgrading to higher level qualification by explanatory variable

	%
Male	12.8
Female	19.5
<i>Father's social class</i>	
Unskilled/Semi-skilled manual	19.3
Skilled manual or non-manual	15.4
<i>Age father left full-time education</i>	
15 or less	16.1
Aged 16	14.6
17 or more	18.2
<i>Age mother left full-time education</i>	
15 or less	16.0
Aged 16	15.3
17 or more	18.2
<i>Type of secondary school attended</i>	
Comprehensive	15.2
Grammar	20.4
Fee-paying	20.3
Secondary modern	16.1
<i>Free school meals</i>	
Yes	20.5
No	16.0
<i>How often reads (age 16)</i>	
No chance	21.3
Hardly ever	13.5
Sometimes	16.8
Often	17.5
<i>Parental interest in child's education</i>	
Very interested	16.2
Some interest	16.4
Little interest	15.8
<i>Parental aspirations for child's education</i>	
Uncertain	17.3
Leave at minimum age	14.0
Full-time education to age 18	15.0
Full-time education after age 18	19.7
<i>Parental expectations for child's education</i>	
Uncertain	17.1
Leave at minimum age	14.6
Full-time education to age 18	15.0
Full-time education after age 18	21.8
<i>CM's expectations for leaving education</i>	
Uncertain	18.0

(Continued)

TABLE A1: (Continued)

	%
Leave at minimum age	15.1
Education to age 17	16.4
Education to age 18 or more	19.8
<i>Cohort member's educational aspirations</i>	
No aspirations for A level study	15.1
Uncertain	15.8
Yes, aspirations for A level study	18.6
<i>Career expectations of cohort member</i>	
Professional/Managerial	21.8
Not professional/Managerial job	15.2
<i>Courses in early adulthood (between age 23)</i>	
Vocational training	
Yes	14.8
No	20.0
Courses for interest	
Yes	20.6
No	15.0
<i>Courses between 23 and 33</i>	
Courses leading to qualifications	
Yes	25.9
No	12.2
Work-related training courses	
Yes	18.8
No	14.8
Courses for interest	
Yes	21.4
No	13.7
Disability or long-term illness by age 33	
Yes	16.7
No	16.1
Had partner at age 33	
Yes	16.1
No	16.8
<i>Number of dependent children (by age 33)</i>	
None	15.8
One	15.0
Two	16.0
Three or more	19.1
<i>Occupational class at age 33</i>	
Professional/Managerial	18.8
Skilled non-manual	17.1
Skilled manual	10.9
Semi-skilled/unskilled manual	18.5
<i>Economic activity at 33</i>	
Full-time work	14.4
Part-time work	21.2

(Continued)

TABLE A1: (Continued)

	%
Unemployed/Out of labour force	18.0
<i>Type of work at 33</i>	
In public sector	
Yes	20.6
No	15.0
Working for large employer	
Yes	16.3
No	16.2

Note: Results averaged across 50 imputed data sets.

TABLE A2: Mean scores on continuous explanatory variables by whether upgraded to higher level qualification in midlife

	Whether upgraded or not	
	Yes	NO
<i>Age 11 test score</i>		
Mean	0.12	-0.05
SD	1.40	1.35
<i>Motivation score</i>		
Mean	21.05	21.00
SD	5.71	5.63
<i>School disengagement score</i>		
Mean	1.11	1.08
SD	0.86	0.84

Note: Results averaged across 50 imputed data sets.