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1. INTRODUCTION

Many social surveys now collect detailed information about the qualifications obtained by individuals. The reason for this is that education is seen as a powerful explanatory factor affecting behaviour throughout the lifecourse. Educational attainments will have a major impact on the transitions of young people into employment and on subsequent progress in a career and on the level of earnings. Education also has strong associations with entry into partnerships, the timing and number of births, and parenting behaviour. It may also be related to other aspects of behaviour including health as an adult, civic engagement, the likelihood of committing crime and a wide range of other matters of interest to social scientists. Qualifications can provide a convenient summary of a person's formal educational experience. Qualifications reveal which courses have been undertaken and the standards which have been attained. Since qualifications relate to the stages of education, as well as to curriculum content, they also show how much time has been spent in education.

In order to operationalise the qualifications data gathered in social surveys it is usually necessary to categorise and classify qualifications, to derive simple measures suitable for use as explanatory variables in quantitative analysis. However, there are difficulties in accomplishing this. A questionnaire survey of researchers conducted in the late 1990s on the problems associated with qualifications data identified three key problems. Firstly, ordering, grouping, classifying and coding of qualifications into a useable number of categories: it was not clear how to cluster and group qualifications. Secondly, the lack of detail gathered from respondents was a serious problem in using some surveys. Thirdly, there were real difficulties in making comparisons, whether of different educational systems or of changes over time within a particular system (Campanelli and Channell, 1996). While some improvements in the data gathered may have occurred since this survey was undertaken some ten years ago all these problems remain very pertinent for researchers planning to make use of qualifications data.

This paper analyses the problems which arise whenever researchers attempt to categorise qualifications data. How do social scientists construct summary measures of qualifications attained? Is a simple measure of highest qualification sufficient, and if so, how many levels should be used? Is it necessary to distinguish different types of qualification, such as academic and vocational qualifications, also? Comparison over time is another key issue. All the surveys discussed in this paper are longitudinal which means comparisons between old and new qualifications are unavoidable. Is there any agreement about the best way to do this?

In considering these issues we focus on research which has been conducted using the British Household Panel Survey (BHPS), the Labour Force Survey (LFS) and the National Child Development Study (NCDS). Each of these is a major, and widely used, survey and together they provide examples of three different types of survey: a panel survey, a rotating panel design and a cohort study. In the next section we address the conceptual issues of using qualifications to summarise educational experiences and outcomes, while Section 3 considers the more practical aspects of utilising qualifications data. Section 4 introduces the three surveys and looks at the ways in which researchers have used the qualifications data contained within them. A key question is whether the method of classify qualifications makes any difference to the substantive results of quantitative analysis. If a different classification scheme had been adopted would researchers have obtained different results?

The available evidence on this is reviewed in Section 5. We draw together our conclusions in Section 6.

2. CONCEPTUAL ISSUES IN USING QUALIFICATIONS TO SUMMARISE LEARNING

It is first necessary to consider the underlying rationale for using qualifications data. What are we trying to capture when we measure educational qualifications in social surveys? Qualifications reveal individuals' attainment, so they provide an indication of the ability to learn, as well as indicating perseverance and the ability to accomplish tasks or assignments. Qualifications may also be shorthand measures for learning but they do not necessarily equate to the learning experience. Qualifications may also indicate acquisition of skills, especially for vocational qualifications. For the labour market, qualifications are credible signals to employers of what individuals have achieved. They indicate that individuals have mastered what was taught and produced what was expected of them, which are valuable tools for labour market success. In summary, qualifications attained can be thought of as an output measure of education.

The way in which educational attainments are linked to socio-economic outcomes will depend on the research questions being investigated and on the underlying theoretical frameworks to be used. Economists investigating the earnings benefits of education typically draw on human capital theory in which, essentially, education is seen as a form of investment by individuals from which they would expect to gain a return over their working lifespan. Seminal papers in human capital include Schultz (1961) and Becker (1975, 1991). Important papers on human capital and the growth of whole economies are Romer (1986), Lucas (1988) and Barro (1995), and recent sophisticated economic models of human capital formation have been developed by Heckman (2005). Under this framework, qualifications measure skills and abilities gained and the higher earnings of well-educated individuals reflect their higher levels of productivity.

However, if the research question is not concerned with economic outcomes, such as earnings, but social or psychological benefits such as mental health, then one would have to think about the psycho-social benefits of learning. In this case, qualifications may measure the effects of education on individuals' self concepts, which promotes positive health behaviours, protects mental health and helps individuals to manage chronic health conditions (Schuller et al., 2002; Hammond, 2004).

We emphasise that a significant effect of qualifications, regardless of the classification, on outcomes may indicate that it was the experience of learning but it may also indicate a signalling effect. The mechanisms for these effects are different and have different policy implications. For example, whereas the learning process explanation suggests a general mechanism that may bring absolute benefits for economic and non-economic outcomes if educational participation were widened, in the signalling approach it is one's relative position in the educational attainment hierarchy that is key so gains will not occur for individuals from a general increase in educational participation.

Key features of learning experience are conceptualised by educationalists in terms of constructs such as learning ethos, pedagogy, curricula and assessment as well as in terms of the broader social relations experienced in a learning context. In conceptual terms all of these features of learning may have important implications for economic and non-economic outcomes either positively or negatively depending on their manifestation and may be in different ways the all-important mechanisms for educational effects. It is unfortunate,

therefore, that although qualitative and conceptual research indicates that these features of learning may be important there is very little quantitative research that enables evaluation of the magnitude or external validity of these potential effects. However, it may be difficult to gather such information particularly in general purpose surveys where learning/education is just one short module amongst many others.

3. PRACTICAL ISSUES IN USING QUALIFICATIONS DATA

Years of education has sometimes been used as an alternative summary measure of educational attainment particularly in US studies of returns to education. Compared to qualifications data, the main disadvantages of years of education are, firstly, that time spent in the classroom is not the same thing as attainment and secondly that education may be heterogeneous. For example if academic attainment is worth more in the labour market then an extra year spent studying academic subjects should be treated differently from those following a vocational curriculum (Dearden et al, 2002). Another particular concern in relation to use of the number of years of schooling is that it does not takes account of the quality of that schooling or of the extent to which learning or other important features of development occurred. Furthermore, it assumes that all else being equal more years of education is a good thing, but for some individuals the experience of education could have negative consequences in adulthood (Hammond and Feinstein, 2006).

Qualifications attained tends to be highly correlated with years of education in that it is generally necessary to attain entry level qualifications to proceed to the next stage of learning and those with greater quantity of education (years of schooling) will therefore also tend to have higher levels of qualification. Thus it is difficult to tease out the separate effects of participation and qualification, although consideration of effects for those who fail to qualify at the end of a learning experience can give some guide to the difference in effect of duration and qualification (Layard and Psacharopoulos, 1974; Murnane et al, 2000; Clark and Jaeger, 2002).

In using qualifications data, researchers have to decide how many different types of qualifications to distinguish. Sometimes it may be sufficient to have a single scale with, say, five levels. However, often it will be necessary to differentiate between academic and vocational qualifications; this will be particularly important for analysing economic returns to qualifications, where there is a long-running debate about the 'parity of esteem' of these two types of qualification in the labour market (see e.g. Robinson, 1997; Dearden et al, 2002). Finer distinctions in types of qualification are also possible. For example, the Qualifications and Curriculum Authority's National Qualifications Framework has three types of qualification – academic, vocationally-related and occupational (see Table 3 below).

Some other problems which can occur in classifying qualifications include dealing with qualifications which can be assigned to different levels. For example, low-grade GCSEs may be considered to be level 1 while grades A* to C will be level 2 in some survey data. Also researchers may allocate to different levels according to the number of qualifications, so that one A level, for instance, could be level 2 while people with more than one are assigned to level 3. The number of subjects at each level is also important for individuals' progression in education. For individuals, achieving 2 or more A levels implies the possibility to go into university.

In the 1980s in Britain there was concern that the plethora of vocational qualifications was causing much confusion and unnecessary duplication. In a major reform initiative, the National Council for Vocational Qualifications (NCVQ) attempted to set up a new system of competence-based awards, National Vocational Qualifications (NVQs). The NVQs initially had six, and subsequently, five standards or levels of attainment. NVQs failed to displace existing British vocational qualifications and the various awarding bodies have continued to

offer and develop non-NVQ vocational qualifications (Raggatt and Williams, 1999; Wolf, 2002). Nonetheless, researchers have found the system of NVQ levels convenient in simplifying the classification of qualifications for statistical analysis and it has been widely adopted in research work. Non-NVQ vocational qualifications are slotted in at their approximate/most appropriate NVQ-equivalent level.

Change over time in the educational system leads to a very marked generation effect in the portfolio of qualifications held by people of different ages. The oldest members of the currently economically active population acquired their qualifications in the late 1950s and early 1960s. There have been substantial changes in the set of qualifications available since that time with the pace of change apparently ever-quickening. By the 1980s and 1990s the spectrum of qualifications available and the terminology seemed to be changing from year to year, especially in the field of vocational qualifications (see Unwin, et al. 2004 for a concise discussion of changes to vocational qualifications over time in Britain). This makes consistent classification of qualifications very difficult as methods have to be devised to fit all these qualifications into a sensible, unifying framework so that individuals of different ages can be meaningfully compared. Qualifications are also context specific, so they differ across countries. For instance, the OECD produces the Education at a Glance report which includes a comprehensive framework for comparing educational attainment across OECD countries (for problems in making international comparisons of qualification levels see Steedman and McIntosh, 2001).

Finally, some researchers may wish to draw upon broader measures of engagement in learning. Qualifications capture only a subset of all learning experiences. People often participate in training courses at work. There is learning through observation and experience Education can also be a rewarding and enjoyable leisure activity for many people. Thus in studies of post-initial education and of the wider benefits of learning it may be particularly important to take such activities into account.

4. CATEGORISING QUALIFICATIONS IN THREE MAJOR SURVEYS

The classification of qualifications in social surveys depends on how detailed is the information collected on individuals' educational backgrounds and, in the case of longitudinal studies, recent educational attainments. This brings the question: what information is needed to classify qualifications? We consider here six relevant types of information on qualifications, namely the level of qualifications, the number of qualifications, subject of study, timing of the event, characteristics of the learning provider, and engagement in learning. Firstly, the level of qualifications attained. This allows the classification of qualifications into highest qualification held and to differentiate between types, e.g. academic versus vocational. Sometimes, information is only collected on the highest qualifications attained. However, an ideal indicator of the level of qualifications would be to collect all qualifications gained which led to the highest qualification obtained so far. This latter information is extremely useful to understand individuals' trajectories in the educational system and how through different trajectories some individuals reach similar levels of qualifications. Second is the number of qualifications held at a particular level. This improves the information on highest educational qualifications. It allows a deeper understanding of individuals' educational attainment, whereby for example a person with three A-levels but no higher education can be considered to achieve more than a person with only one A level.

Thirdly, information on subjects is also important, especially when the impact of education on outcomes depend on subjects. At the level of higher education returns to education may depend on subject studied, for example, the economic returns to arts degrees may be significantly lower than for science degrees. Fourthly, information on the timing of the event. This is particularly important for studies aiming at unpacking the causal effect of education on outcomes. With longitudinal datasets it is possible to get around the simultaneity of education and outcomes. Education could be measured as highest qualification by age 20 and on outcome up to age 30, say. However, when trying to establish effects of changes in education on changes in outcomes the question remains as to whether the change in education preceded the change in the outcome.

The fifth type of information describes the characteristics of the learning provider. Researchers may be interested in knowing where learning took place, the quality of the service provided, and the nature of the learner provider. Lastly, the time involvement of the individual while gaining the qualification. Here, for courses that lead to qualifications, information can be divided into two categories: part time or full-time. In other cases, especially for training programmes that do not necessarily lead to qualifications, detailed information on the length of the course and the level of involvement of the individual is particularly important. For example, for computing literacy a quick introduction to a software package is not the same as achieving expertise in the use of that particular software. Table 1 summarises the level of information collected in the three major social surveys analysed here.

Table 1: Information on qualifications in three social surveys in the UK

Type of Information	Social Surveys		
	NCDS	LFS	BHPS
Level	All qualifications	All qualifications	All qualifications
Number at level	No	Yes	Yes
Subject	Yes (in 2000 sweep)	No	No
Timing of event	Qualifications gained since the last sweep, e.g. between ages 33 & 42.	Qualifications gained in last year	Qualifications gained in last year
Learning provider	Yes (in 2000 sweep)	No	No
Individuals' involvement PT/FTl	Yes (in 2000 sweep)	Yes	Yes
Courses leading to qualifications	Some information in 2000 sweep	Yes	Yes, but only from sweep 8, i.e. 1998, is it possible to make this differentiation with certainty.
Information on amount of involvement	No	Yes	Yes, but it has been modified since 1991. It started with weeks, then moved to hours, then introduced a more flexible indicator.

Source: National Child Development Study (1958), Labour Force Survey and British Household Panel Survey.

4.1 National Child Development Study

The National Child Development Study (NCDS) is a continuing longitudinal survey of people living in Great Britain who were born in a single week in March 1958. The members of this cohort have been surveyed at ages 0, 7, 11, 16, 23, 33, 42 and 46. Details of individual qualifications have been collected in several survey sweeps. In 1978, at age 20, all schools in the UK were contacted in a specially-designed survey which aimed to record the qualifications of NCDS cohort members. At age 23, in 1981, information was collected from cohort members about their qualifications including higher education and vocational qualifications obtained since leaving school. Ten years later (at age 33) information was gathered on courses leading to qualifications since the age of 23. For those who had undertaken two or more such courses details were obtained on the two courses which aimed for the highest level of qualification. In addition respondents were asked about all of the qualifications which they had ever obtained. At the age 42 sweep very detailed information was collected on a wide range of qualifications including the level and subject of the award and where and when it had been undertaken. Cohort members who had been present in the 1991 sweep were asked about qualifications achieved between then and 2000, while cohort members not interviewed in 1991 were asked about all qualifications ever attained (see Ferri et al, 2003 for details). At age 46, respondents were asked for details of qualifications

obtained since the last interview, including a range of both academic and vocational qualifications. For each qualification type they were asked how many they had obtained, the date obtained and in which subjects, as well as whether they had studied full-time or part-time.

Table 2: Qualification Levels in NCDS sweep 5

Level	Qualifications
5	Higher education (NVQ5 and NVQ6): First Degree, postgraduate diploma, masters, PhD
4	Other higher education (NVQ4): training college certificate, unvalidated diploma or certificate, nursing qualification, professional qualification, TEC/BEC/BETEC and Scottish equivalent, Higher National Diploma, Joint Industry Board HNC/HND, CGLI full technical qualification
3	A level equivalent (NVQ3): TEC, BEC, BTEC National Certificate or Diploma, Joint Industry Board ONC/OND, CGLI Advanced part 2, Scottish Certificate of 6th form studies, GCE and Scottish highers, GCE A level
2	O levels or equivalent (NVQ2): Joint Industry Board Technicians Certificate, CGLI Operative, Insignia Award and other qualifications, RSA Stages 2 and 3, Scottish standard grade, ordinary grade, O level, CSE grade 1, GCSE
1	Some qualification (NVQ1): RSA Stage 1, CSE grades 2 to 5, other technical and business qualifications

Source: Bynner and Fogelman (1993).

The NCDS has been widely used and researchers have adopted a variety of approaches to categorising the qualifications information contained in the survey. Bynner and Fogelman (1993) were among the first to draw on the idea of NVQ-equivalents to summarise the NCDS qualifications data and their classification is shown in Table 2. This gives a clear summary of highest overall qualification. Sometimes researchers have preferred to distinguish different types of qualifications as well as NVQ-equivalent levels and recently attempts have been made to utilise the QCA's National Qualifications Framework for this purpose. Following the National Qualifications Framework, Jenkins et al (2003) distinguished three broad types of qualifications – academic, vocationally-related and occupational, with five levels based on NVQ equivalents. A novel feature of the NQF is the vocationally-related category. These qualifications are seen as having some vocational relevance but also as having some value for those pursuing academic pathways, for example BTECs and GNVQs might be useful for those wishing to progress to university.

Table 3: National Qualifications Framework

Level of Qualification	General (Academic)	Vocationally-related (Applied)	Occupational (Vocational)
5	Higher Degree		NVQ level 5 PGCE Professional degree level qualifications
4	Degree HE Diploma	BTEC Higher Certificate/Diploma HNC/HND	NVQ level 4 Nursing/paramedic Other teacher training qualification City & Guilds Part 4/Career Ext/Full Tech RSA Higher Diploma
3	A level AS levels Scottish Highers Scottish Cert of 6th Year Studies	Advanced GNVQ BTEC National Diploma ONC/OND	NVQ level 3 City & Guilds Part 3/Final/Advanced Craft RSA Advanced Diploma Pitmans level 3
2	GCSE grade A*-C O levels grade A-C O levels grade D-E CSE grade 1 Scottish standard grades 1-3 Scottish lower or ordinary grades	Intermediate GNVQ BTEC First Certificate BTEC First Diploma	NVQ level 2 Apprenticeships City & Guilds Part 2/Craft/Intermediate City & Guilds Part 1/Other RSA First Diploma Pitmans level 2
1	GCSE grade D-G CSEs grades 2-5 Scottish standard grades 4-5 Other Scottish school qualification	Foundation GNVQ Other GNVQ	NVQ level 1 Other NVQ Units towards NVQ RSA Cert/Other Pitmans level 1 Other vocational qualifications HGV

As a continuing longitudinal study which has been running over many years researchers using NCDS have to face how to make comparisons when the qualifications system has changed over time. In order to derive a summary measure of the highest qualification ever obtained by an individual it is necessary to take some account of how old and new qualifications compare. For example, how do GCSEs compare to O levels and CSEs, and how should newer qualifications such as GNVQs be fitted into a summary framework of qualifications attained? Jenkins and Wolf (2004) drew on data from the fifth sweep of NCDS which covers qualifications obtained by cohort members up to1991 and data from the sixth sweep of NCDS which contains information on qualifications between 1991 and 2000. The classification scheme which they chose to adopt is shown in Table 4. There is a split between academic and vocational types of qualification and for each of these there are five NVQ-equivalent levels. It was possible to establish approximate equivalencies between the categories used in the 1991 and 2000 sweeps of NCDS.

Table 4: Equivalencies between NCDS 5 and NCDS 6

NCDS 5	**NCDS 6**
Academic level 5: University or CNAA Higher Degree Academic level 4: University or CNAA First Degree incl B.Ed/Polytechnic Diploma or Certificate (not CNAA validated)/University or CNAA Diploma or Certificate, including Dip HE and teacher training college certificate Academic level 3: A level / Scottish Higher Grade Scottish Certificate of Sixth Year Studies Academic level 2: CSE grade 1/O level grades A-C GCSE grades A-C /Scottish O grade - pass or grades A-C Scottish standard grade grades 1-3 Academic level 1: CSE grades 2-5 Vocational level 5: Full Professional Qualifications: membership awarded by a professional institution/ University or CNAA Postgraduate Diploma Vocational level 4: Part of a Professional Qualification eg Part I of a two-part course Nursing qualifications/HNC/HND TEC/BEC/BTEC: Higher National Certificate or Diploma City & Guilds Full Technological Vocational level 3: ONC/OND TEC/BEC/BTEC National/General Certificate or Diploma City & Guilds: Advanced/ final/ part 2 or 3 RSA stage 3 Vocational level 2: JIB/NJC or other craft/technician certificate City & Guilds operative City & Guilds craft/intermediate/ordinary/part1 City & Guilds other/can't say which Insignia Award in Technology RSA stage 2 Vocational level 1: RSA stage 1 Other technical or business qualifications Any other qualification	Academic level 5: Higher degree Academic level 4: First degree HE Diploma Academic level 3: A level/AS level/Advanced GNVQ Scottish Highers/Scottish Certificate of 6th Year Studies Academic level 2: GCSE grades A*-C/ Intermediate GNVQ Scottish standard grades 1-3/ Scottish lower/ordinary grades Academic level 1: GCSE grades D-G/Foundation/other GNVQ/ Scottish standard grades 4 and 5 Other Scottish school qualifications Vocational level 5: NVQ level 5/PGCE/ Professional degree level qualification Vocational level 4: NVQ level 4/Nursing/paramedic qualification/BTEC Higher Certificate/Diploma/HNC/HND Other teaching training qualification City & Guilds Part 4/Career Extension/Full Technology RSA Higher Diploma Vocational level 3: NVQ level 3/BTEC National Diploma ONC/OND/City & Guilds Part 3/Final/Advanced Craft RSA Advanced Diploma/Pitmans level 3 Vocational level 2: NVQ level 2/Apprenticeships BTEC First Certificate/First Diploma City & Guilds Part 2/Craft/Intermediate RSA First Diploma/Pitmans level 2 Vocational level 1: NVQ level 1/other NVQ/units toward NVQ/ RSA Certificate/Other Pitmans level 1/ HGV Other vocational qualifications

4.2 Labour Force Survey

The Labour Force Survey (LFS) is a quarterly survey of households in the UK. The LFS covers about 120,000 people in some 60,000 households and is carried out by the Office for National Statistics. The LFS provides information on qualifications held by people of working age and is used to monitor progress towards various targets for attainment in post-16 education set by the DfES and Learning and Skills Council in England (ONS, 2004).

LFS was a biannual survey until 1984; it was annual between 1984 and 1991. Since 1992 LFS has been a quarterly survey, with each quarter's sample made up of five waves. Each wave is interviewed for five successive quarters so that in any particular quarter one wave is being interviewed for the first time, one wave for the second time and so on. Respondents are asked to give full details of their qualifications in the first wave and in later waves they are asked if they have obtained any qualifications since their last interview.

There have been some changes to LFS which affect comparisons over time in qualifications held by the working population. For example, there was a switch to computer-assisted interviewing in 1992, while the introduction of the rotating panel design at that time enabled missing data to be imputed by bringing forward responses from the previous quarter. Until 1996 the survey asked for the three highest qualifications held but since then has asked respondents about all their qualifications (Middlemas and Sly, 1998).

Table 5: Qualification levels in Labour Force Survey

Level	Qualifications
5	Higher degree; NVQ level 5.
4	First degree; other degree-level qualification such as graduate membership of a professional institute; NVQ level 4; higher education below degree level; higher level BTEC or SCOTVEC; HNC or HND; RSA higher diploma; teaching qualifications; nursing qualifications.
3	NVQ level 3; advanced GNVQ; BTEC or SCOTVEC National Certificate; RSA advanced diploma; City & Guilds advanced craft; two or more A levels; four or more AS levels; three or more Scottish highers; 67 per cent of those with Certificate of Sixth Year Studies; 50 per cent of those with a recognised trade apprenticeship; 10 per cent of those with other professional, vocational or foreign qualification.
2	One A level; two or three AS levels; one or two Scottish highers; 33 per cent of those with Certificate of Sixth Year Studies; 50 per cent of those with a recognised trade apprenticeship; NVQ level 2; Intermediate GNVQ; BTEC or SCOTVEC first or general diploma; City & Guilds craft; five or more GCSE grades A* to C or equivalent (i.e. O level, CSE grade 1, SCE Standard/Ordinary grades 1 to 3); 35 per cent of those with other professional, vocational or foreign qualification.
Below level 2	One AS level; fewer than five GCSE grades A* to C or equivalent; NVQ level 1; Foundation GNVQ; BTEC or SCOTVEC first or general certificate; other RSA qualifications; other City & Guilds qualifications; GCSE grades D to G; CSE below grade 1; YT Certificate; 55 per cent of those with other professional, vocational or foreign qualification.

Source: Middlemas and Sly, (1998).

Since the introduction of NVQs in the late 1980s people's qualification levels have often been expressed in terms of NVQ level equivalents. The way that qualifications are converted to NVQ levels for LFS is shown in Table 5 (source: Middlemas and Sly, 1998).

For some qualifications it is not possible to tell on the basis of the information contained in LFS whether it should be placed at a certain level and so proportionate allocations are made to different levels. For example, trade apprenticeships could be a level 2 or level 3 qualification so 50 per cent are allocated to level 2 and 50 per cent to level 3. The LFS classification makes only broad distinctions between qualifications so some researchers using LFS prefer to use their own more detailed classifications and apply them to the LFS data. An example from research by Dearden et al (2004) is shown in Table 6. As is common this distinguishes academic and vocational qualifications as well as the level of qualification held.

Table 6: Coding of LFS qualifications data

Level	Academic	Vocational
5	Masters; Doctorate; other postgraduate qualification; higher degree but type unknown	NVQ level 5; PGCE – higher degree; other degree such as graduate member of professional institute
4	First degree; degree but type unknown; Higher Education Diploma; other higher education qualification	NVQ level 4; Teaching qualification (excluding PGCE); Scotvec Higher level; HNC/HND; Nursing/other medical qualification; RSA Higher Diploma;
3	Certificate of 6th Year studies; 4 or more AS levels; Scottish Highers; more than one A level	NVQ level 3; Scotvec Full National Certificate; ONC/OND; GNVQ advanced; RSA Advanced Diploma or Certificate; City & Guilds Advanced Craft/Part 3;
2	5 or more CSEs at grade 1; 5 or more GCSEs at A-C; 5 or more SCE ordinary passes; 5 or more O level passes; 2 or 3 AS levels; 5 or more passes at SCE standard or ordinary; one A level	NVQ level 2; GNVQ intermediate; RSA Diploma; City & Guilds Craft/Part 2;
1	CSEs but none at grade 1; more than 1 but less than 5 CSEs at grade 1; GCSEs but none above grade C; more than 1 but less than 5 GCSEs at C or above; O levels but less than 5 passes; SCE ordinary but less than 5 passes; 1 AS level; SCE less than 5 passes at standard or ordinary grades	NVQ level 1; GNVQ foundation/ level unknown; some other RSA qualification; City & Guilds Foundation/Part 1/other; YT Certificate; National Qualifications, Scotland; any other professional,vocational or foreign qualification

Source: Dearden *et al* (2004), p58.

4.3 British Household Panel Survey

The British Household Panel Survey (BHPS) was designed as an annual survey of each adult (16+) member of a nationally representative sample making a total of

approximately 10,000 individual interviews. The same individuals are re-interviewed in successive waves and, if they split-off from original households, all adult members of their new households are also interviewed. Children are interviewed once they reach the age of 16. Thus, in each successive wave new entrants as well as individuals are being re-interviewed. Currently, there are 14 waves or sweeps of annual interviews. The sample is representative of the population in Britain in 1991 and, as long as major demographic changes have not occurred in the British population over time, this sample remains representative of the population today (Taylor et al. 1996).

Table 7: Categorisation of highest academic or vocational qualification in the BHPS

Educational Qualification in BHPS categorisation	Level
University or CNAA Higher Degree	Ac-level 5
University or CNAA First Degree	Ac-level 4
Teaching Qualifications	Voc-level 4
City & Guilds Certificate (Full Technological/Part III); HNC, HND, BEC/TEC/BTEC Higher Certificate/Diploma; University Diploma; Any other technical, professional or higher qualifications	Voc-level 4, Ac-level 4
Nursing Qualifications	Voc-level 4
A Levels; Scottish Higher Grades; Scottish School Leaving Certificate Higher Grade; Scottish Certificate of Sixth Year Studies; Higher School Certificate; Ordinary National Certificate/Diploma, BEC/TEC/BTEC National/General Certificate or Diploma; or City & Guilds Certificate (Advanced/Final/Part II)	Ac-level 3 or Ac-level 2, Voc-level 3
O Levels (pre 1975); O Level grades A-C (1975 or later); GCSE grades A-C; CSE grade 1, Scottish O Grades (pass or bands A-C or 1-3); Scottish School Leaving Certificate Lower Grade; School Certificate or Matriculate; Scottish Standard Grade Level 1-3; or City & Guilds Certificate (Craft/Intermediate/Ordinary/Part I)	Ac-level 2 or Ac-level 1, Voc-level 2
Clerical or Commercial Qualifications	Voc-level 1
CSE Grades 2-5; O Level grades D-E; GCSE grades D-G; Scottish SCE Ordinary Grade bands D-E or 4-5; or Scottish Standard Grade levels 4-7	Ac-level 1
Recognised trade apprenticeship	Voc-level 2
Youth Training Certificate; Any other qualifications	Voc-level 1

Source: BHPS.

The BHPS produces information on educational background and recent attainments and, in addition, numbers of subjects passed for some school qualifications such as O-levels and A-levels. In terms of educational background, the BHPS records all qualifications obtained including school, higher education and vocational qualifications. In terms of recent attainments, it records all qualifications obtained since September of the year before.

Double-counting educational attainments is possible as some people would have obtained qualifications reported in the first wave after September 1991 and report such qualifications both in the first and second waves of interviews. This issue may be accentuated through a tendency to report qualifications more than once.

According to Taylor et al. (1996) it is quite possible to obtain the same level of qualifications two years running, and no attempt had been made to eliminate this problem. If only highest level of educational qualifications per year is required, double-counting qualifications is not a problem in the BHPS.

The BHPS contains two derived variables for highest educational qualifications attained, *highest academic or vocational qualifications* and *highest academic qualifications*. These variables are updated each year to include the most recent qualifications of new entrants and existing panel members (Tables 7 & 8).

Table 8: Categorisation of highest academic qualification

Academic Qualification in BHPS categorisation	Level
University or CNAA Higher Degree	Ac-level 5
University or CNAA First Degree	Ac-level 4
HNC, HND, BEC/TEC/BTEC Higher Certificate/Diploma; Teaching Qualifications	Voc-level 4
A Levels; Scottish Higher Grades; Scottish School Leaving Certificate Higher Grade; Scottish Certificate of Sixth Year Studies; Higher School Certificate; Ordinary National Certificate/Diploma, BEC/TEC/BTEC National/General Certificate or Diploma; or City & Guilds Certificate (Advanced/Final/Part II)	Ac-level 3 or Ac-level 2, Voc-level 3
O Levels (pre 1975); O Level grades A-C (1975 or later); GCSE grades A-C; CSE grade 1, Scottish O Grades (pass or bands A-C or 1-3); Scottish School Leaving Certificate Lower Grade; School Certificate or Matriculate; Scottish Standard Grade Level 1-3; or City & Guilds Certificate (Craft/Intermediate/Ordinary/Part I).	Ac-level 2 or Ac-level 1, Voc-level 2
CSE Grades 2-5; O Level grades D-E; GCSE grades D-G; Scottish SCE Ordinary Grade bands D-E or 4-5; or Scottish Standard Grade levels 4-7	Ac-level 1

Source: BHPS.

Sabates (2003) points out some shortcomings and inconsistencies of the derived variables for educational qualifications in the BHPS. The derived variable *highest academic qualifications* contains also vocational qualifications. Some categories for the variable *highest qualifications* combine vocational and academic qualifications, whereas other categories only include either academic or vocational qualifications. This generates inconsistencies with NVQ level equivalents based on the National Qualifications Framework. Furthermore, the BHPS' categorisation includes the variable 'other technical, professional or higher qualifications' as an NVQ level 4 equivalent. The BHPS also combines Youth Training Certificate with 'any other school qualifications'. Without any further specific information about these qualifications, it will be incorrect to assume that all these unknown qualifications are equivalent to a specific NVQ level equivalent, such as level 4 or level 1.

Sabates (2003) proposes the re-classification of qualifications based on NVQ equivalents (Tables 9 and 10). For academic qualifications it is possible to obtain five levels NVQ equivalents but for vocational qualification only four levels. The number of subjects passed is used to discern between two different NVQ level equivalents. This is the case for A-levels, Scottish Higher Grades, O-levels, GCSE

and Scottish O Grades. As the BHPS is a panel of the population, a feature of the classification is the comparison of qualifications over time.

Table 9: BHPS' academic qualifications conversion to NVQ level equivalents

Qualifications	Subjects	Level
University or CNAA Higher Degree	n.a.	5
University or CNAA First Degree and University Diploma	n.a.	4
A Levels	2+	3
Scottish Higher Grades	3+	3
Higher School Certificates; Scottish School Leaving Certificate Higher Grade and Scottish Certificate of Sixth Year Studies	any	3
A Levels	1	2
Scottish Higher Grades	1 or 2	2
GCSE grades A-C; O Levels (pre 1975); O Level grades A-C (1975 or later); Scottish O Grades (pass or bands A-C or 1-3)	5+	2
Certificate or Matriculate; CSE grade 1; Scottish School Leaving Certificate Lower Grade; School Scottish Standard Grade Level 1-3	any	2
GCSE grades A-C; O Levels (pre 1975); O Level grades A-C (1975 or later); Scottish O Grades (pass or bands A-C or 1-3)	1 to 4	1
CSE Grades 2-5; O Level grades D-E; GCSE grades D-G; Scottish SCE Ordinary Grade bands D-E or 4-5; or Scottish Standard Grade levels 4-7	any	1

Note: When number of subjects were not reported we considered the lower level equivalent.

The BHPS has been widely used by researchers and education has been a key control variable in most studies on income dynamics, poverty, and social mobility. However, we find that when the focus of the study is not on the relationship between education and outcome, but rather on other predictors or on the outcome itself, little attention is placed into the classification of qualifications. Of the studies that do link education and outcomes, education has been utilised in a variety of ways. Groot (1998), in estimating the rate of depreciation of education, utilises years of schooling, calculated as the highest educational qualification times the number of years needed to complete the level. Egerton (2002) utilises five categories of education in her analysis of youths' civic engagement and education. These categories are graduate, sub-degree, A-level and NVQ3, below NVQ3 and mature graduates. Her categorisation of education is based on the research design, where information was gathered on young people's membership in civic organisations at different ages (16, 17, 22 and 24). Brynin and Francesconi (2002) classify educational background as less than O-levels, O-levels or GCSE, A-level, higher vocational degree and university or higher academic degree to address the effects of partner's observable and unobservable human capital characteristics into her partner's labour market outcomes. This classification of educational qualifications is more closely related to the National Qualifications Framework.

Table 10: BHPS' vocational qualifications conversion to NVQ level equivalents

Qualifications	Level
Teaching Qualifications; Nursing Qualifications; City & Guilds Certificate (Full Technological/Part III); HNC, HND, BEC/TEC/BTEC Higher Certificate/Diploma. **From Wave Eight**, NVQ level 4.	4
Ordinary National Certificate/Diploma, BEC/TEC/BTEC National/General Certificate or Diploma; or City & Guilds Certificate (Advanced/Final/Part II). **From Wave Eight**, NVQ level 3.	3
City & Guilds Certificate (Craft/Intermediate/Ordinary/Part I); Recognised trade apprenticeship. **From Wave Eight**, NVQ level 2.	2
Youth Training Certificate; Clerical or Commercial Qualifications. **From Wave Eight**, NVQ level 1.	1

Note: Categories 'other professional or technical qualification' and 'other school qualifications' are considered as separate categories.

5. ROBUSTNESS OF RESEARCH FINDINGS TO ALTERNATIVE CLASSIFICATION OF QUALIFICATIONS

A key question is whether the adoption of a particular classification scheme for qualifications makes any difference to the results of quantitative analysis. Would different conclusions have been reached if another classification scheme had been selected instead? Unfortunately, it is not possible to obtain a definitive answer to this question. Researchers typically choose one way of categorising their qualifications data and almost never consider the implications of other approaches. Nonetheless, in this section we aim to assemble such fragmentary evidence as is currently available on this topic.

Feinstein et al. (2003b) set out to investigate the impact of alternative educational classification schemes on substantive research findings using NCDS data. In particular they were interested in comparing two earlier studies of the economic and non-economic effects of lifelong learning, both of which had drawn on NCDS and defined lifelong learning in terms of engagement in learning between the ages of 33 and 42. One study, Jenkins et al. (2002) had focused on the economic effects of lifelong learning and had found no wage effects of lifelong learning but some positive employment effects, with lifelong learning defined in terms of qualifications only. This study used the National Qualifications Framework to describe qualifications, distinguishing three types of qualifications each with five levels. The second study, Feinstein et al (2003a), was concerned with the wider (or non-economic) benefits of adult learning and used a broader definition of learning to incorporate work-related training and leisure courses as well as courses leading to qualifications. They distinguished academic and vocational qualifications only, and did not look at the level of qualifications but rather the number of courses undertaken between ages 33 and 42. The main findings were that engagement in adult learning was associated with various indicators such as giving up smoking, changes in measures of life satisfaction and in measures of race tolerance.

Feinstein et al (2003b) were able to test the robustness of these findings, given that the two studies used the same dataset, by applying the educational classifications used in the first study to the second study and vice versa and checking whether the results stood up to the alternative definitions. It was found that 'the broad pattern of results described in both Jenkins et al and Feinstein et al holds regardless of the exact definition of lifelong learning' (Feinstein et al 2003b, p 8). For example, Jenkins et al had found using their detailed breakdown of qualifications attained that there were no robust effects of lifelong learning on wage growth. Applying the broader, less detailed, definitions of lifelong learning confirmed that neither the number of academic nor the number of vocational courses had any effects on wage growth although undertaking work-related training (excluded from the Jenkins et al definition of lifelong learning) did have an impact on wage growth. As to employment effects there were such effects from certain specific vocational qualifications in the Jenkins et al study. Using the broader definition of learning confirmed that the number of vocational courses was significant. Broadly, then, the findings continued to hold when the alternative definitions were used although there were, inevitably, differences in the detail.

Blundell et al (2004) provide an empirical comparison of different statistical approaches to estimate the impact of schooling on earnings using the NCDS. What it of interest for this paper is their analysis on heterogeneous returns to schooling, i.e. returns to education depend on the level of qualifications. As a first point, Blundell et al mention that most authors in the UK choose to adopt qualification-based measures of educational attainment rather than years of education, which is traditionally used in the US context (for example, Dearden 1999a and 1999b and Blundell, et al., 2000 using the NCDS, and Harmon, et al. 2003 using the BHPS). Blundell et al then estimate returns to higher education. The comparison group in their analysis, i.e. those individuals with less than higher education, is a heterogeneous group composed of individuals with different levels of qualifications. However, the underlying assumption of the statistical model is that both groups are homogenous, achievers versus non-achievers. They estimate an average return of about 27% for those completing some form of higher education versus anything else. They further find that overall returns to educational qualifications at each stage of the educational process – leaving school at age 16 without qualifications, O level, A level, and higher education – remain sizeable and significant. Compared with leaving school at 16 without qualifications, they find that in the average return to O levels is around 18%, to A levels 24% and to higher education 48%.

The relationship between education and outcomes, however, may not always depend of the level of qualifications and for some outcomes there may be a clear cut-off point at which educational associations may be found. In analysing the effects of education on the uptake of cervical screening for women in the BHPS, Sabates and Feinstein (2004) found that women with level 2 qualifications are more likely to take up screening for cervical cancer than women without qualifications. Similarly, they found that women with levels 3 and 4 or above were more likely to take up screening than women without qualifications. They then perform a statistical test and found that the estimated effect of level 2 qualifications was no different in magnitude to the estimated effect for levels 3 or 4 and above qualifications. Similarly, they did not find a statistical difference in uptake between women without qualifications and women with qualifications at level 1. Based on these tests, their analysis on the uptake of screening used level 2 qualifications as the cut-off point.

The studies mentioned above have been discussed at some length because they are among the few papers of which we are aware which investigates the robustness of research findings to alternative definitions of educational qualification classifications. However, there are cases where two groups of academics have analysed the same, or very similar, research questions using the same dataset but adopting different classifications of qualifications. Comparisons may then enable some inferences to be made about the importance of the way qualifications have been coded. For example, both Dex et al (1998) and Elliott et al (2001 a,b) used event history models and NCDS data on women up to the age of 33 to analyse the effects of covariates on women's transitions into work after childbirth. Both groups of academics used the information in NCDS on qualifications by 33 to construct summary measures of highest qualification at age 33 but did so in different ways. Dex et al distinguished six levels of qualification attainment as follows: degree; higher education (non-degree); A level or equivalent; O level or equivalent; qualifications below O level; no qualifications.

Elliott et al were particularly interested in the distinction between occupational qualifications and non-occupational qualifications for well-educated women and adopted an eight-fold classification: occupationally specific degree / higher degree including teaching; non-occupational degrees; nursing (below degree level); A levels; O levels; clerical and commercial; apprenticeships, other qualifications or no qualifications.

In broad terms the findings from the two studies were similar in that women with higher levels of qualification tended to make a more rapid transition into work following childbirth compared to women with low level, or no, qualifications. However Elliott et al report that 'the results have demonstrated that there is an important distinction to be made between occupationally specific and non-occupational qualifications at degree level. Occupationally specific qualifications appear to enable women to retain a closer attachment to the labour market during this period of family formation, and in addition would seem to protect women from the drop in earnings typically associated with taking time out of the labour market or working part-time' (Elliott et al p 163). It needs to be borne in mind that the two studies were not identical in other respects so that the comparison of qualification level findings is therefore imperfect. Both used discrete time event history models and controlled for unobserved heterogeneity, but Elliott et al estimate models for first and later births and adopt competing risks models with a distinction between returns to full-time and part-time work, while Dex et al examine returns to work after the first birth only but include a wider range of covariates including an imputed wage in their models. Moreover, qualifications were the main focus in Elliott et al, while education was just one among many covariates of interest in Dex et al (1998). Nonetheless the comparison suggests that some differences in results may occur according to the way qualifications are classified. In this case a distinction between occupational and non-occupational qualifications made some difference to the research findings.

6. CONCLUSIONS

It is clear that both the range of awards covered and the level of detail provided on qualifications have improved over time in the major social surveys such as BHPS, LFS and NCDS and that a rich volume of information is now available to researchers wishing to make use of qualifications data to summarise the educational attainments of individuals. Comparisons over time and between people of different ages are major areas of difficulty in using qualifications due to the extent to which the qualifications system, and especially the vocational qualifications system, has been subject to change and reform in recent years.

In order to operationalise the qualifications data gathered in social surveys it has been necessary to categorise and classify qualifications, to derive simple measures suitable for use as explanatory variables in quantitative analysis. In practice, researchers have tended to utilise schemes based around some form of NVQ equivalents. While the use of the NVQ levels approach seems broadly sensible, there is no consensus on the best ways to convert qualifications into NVQ equivalent levels. For instance some researchers have used four or five (or sometimes more) levels and not distinguished between types of qualifications; others have distinguished between academic and vocational types of qualifications, or between academic, vocationally-related and occupational types, and so on.

In our discussion of conceptual issues we have noted the familiar problem of distinguishing the signalling effects from the genuine effects of qualifications in developing human capital. We have also emphasised the importance of considering underlying theory when analysing the impact of education on socio-economic outcomes. This may differ according to whether economic or non-economic outcomes are being modelled. There are other limitations to the use of qualifications. Qualifications may mask individual heterogeneity in the data. This is because for a certain qualification gained, for example a university degree, there may be significant differences between individuals who obtain the degree on a part-time basis compared to those who choose to study full-time. There are also, potentially, differences between arts, humanities and science degrees. Moreover, there are differences among service providers or universities. So the depth of information which is collected on qualifications matter. For some purposes the emphasis on qualifications should not imply neglect of the potentially vital role of non-accredited learning in the protection and sustenance of non-economic benefits of learning, such as health, parenting, or civic participation.

There is, then, a need for further methodological discussion about the best ways of classifying qualifications and for investigation of the effects that different ways of classifying have on substantive research outcomes. The lack of serious, well-informed literature in this field is both surprising and disappointing. There should be further research and discussion so that a consensus can be reached among social scientists about best practice on the classification of qualifications. It is hoped that this paper will contribute to stimulating such a debate.

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