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Life-course events and later-life employment

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Glossary

(Italics indicate cross- references to other entries).

Base (or default or reference) group (or category) — In a multivariate model containing *dummy variables*, the sub-group used as a benchmark for evaluation of the *marginal effects* due to the dummy variable categories. For example, in the models in this report, being married is the base group (no marginal effect reported), and the marginal effect of being widowed is the difference in the outcomes of widows compared to married individuals.

BHPS — British Household Panel Survey.

Dependent variable — The outcome to be explained in a *multivariate model.*

Dummy variable — A variable taking values 0 or 1, and used to represent outcomes like being in employment or not, or *explanatory variables* such as belonging to a given occupation or not.

Explanatory variable — A measure (such as educational achievement) used to explain the outcome or *dependent variable* in a *multivariate model*.

ISER — Institute for Social and Economic Research, University of Essex.

Marginal effect — The effect of a specified increase in an explanatory variable on the *dependent variable*. In this study, using *probit equations*, marginal effects are given as the change in the probability of an event occurring (e.g. being in employment) due to a change in an explanatory variable.

Mean	The conventional 'average': the sum of the values divided by the number of cases.
Multivariate modelling	A statistical technique for measuring relationships between *explanatory variables* and *dependent variables*, and in particular for isolating the effect of a given variable from the impacts of the other variables.
LS	Office for National Statistics Longitudinal Study.
Panel survey	A survey in which the same sample (of individuals or households) is interviewed repeatedly.
Probit equation	A type of *multivariate model* for estimating the relationship between a set of *explanatory variables* (e.g. life-course factors) and a *dependent variable* taking only two values (e.g. employed compared to not employed; or exit employment compared to stay in employment).
Stata	The statistical program used to analyse the survey data and estimate the relationships.
(Statistically) significant	If measurements are based on a random sample of households, rather than all households in the population, the estimates will vary either side of the true value, depending on chance factors affecting which particular households were chosen. The larger the sample, the lower the risk of chance variation. An estimate is judged to be 'statistically significant at the five per cent level' if the probability of its having arisen by chance is less than five per cent. This is denoted by * in the tables. A more stringent requirement is 'statistical significance at the one per cent level': the probability of the estimate having arisen by chance is less than one per cent. This is indicated by ** in the tables.
WERS 2004	Workplace Employment Relations Survey 2004.

Summary

Much is already known about how later-life factors and events affect when people exit work. Important determinants of labour market withdrawal include health and disability, individual pension savings and pension entitlements, and job characteristics such as physical strains and job autonomy.

Less is known about how earlier life-course events, such as educational achievement, labour market entry and family formation, also affect employment in later life. The purpose of this study is to investigate these relationships. The analysis is mainly based on data from the British Household Panel Survey (BHPS), with supplementary data merged in from the Workplace Employment Relations Survey 2004 (WERS 2004). Complementary analysis uses the ONS Longitudinal Study (LS).

We focus on employment outcomes among 50-70 year-old men and women. Employment rates for this group decline from over 80 per cent among men and 70 per cent among women at age 50, to ten per cent (men) and six per cent (women) at age 70. Most of the decline (about 60 per cent of exits from work) is due to (self-declared) retirement, although withdrawal to care for family members is an important exit route for women (18 per cent of exits). About 11 per cent of exits (for both sexes) are into long-term sickness/disability. Although the proportion of part-time jobs increases at older ages, individual workers do not generally reduce their working hours before leaving employment. The focus of the study is on whether individuals are working or not at ages 50-70, and their likelihood of making a transition out of employment. We adopt a sequential analysis approach, in which we first investigate the impact of very early life events (to see their 'total' effects on later-life employment), before bringing in subsequent life events to see how they mediate the effects of previous factors. Our main findings are as follows.

Early life events

Parental background

Overall, there is little association between a person's parental background and their own later-life employment. We find no evidence for either men or women that being the child of a lone parent or an unemployed father leads to lower employment levels in later life. But we do find some influence (for men only) when considering a more detailed categorisation of parental social class. Men brought up in the 'higher' classes – professionals, other non-manual workers and the self-employed – have higher employment rates. Among men whose parents were 'professionals', this can be explained by these men's higher educational attainments.[1] Among the sons of non-manual workers and the self-employed[2], the effect persists after controlling for subsequent life factors including educational achievement, occupation and later-life health. Employment rates after 50 for sons of non-manual workers and the self-employed are about 10 percentage points higher than for other classes. A possible explanation is that boys in these two classes acquired a work ethic (independently of formal schooling) which favours continuing employment in later life. Of course, our evidence is from past cohorts (the youngest born in the mid 50s) so there is no guarantee that this effect will be reproduced in the future.

Education

Unsurprisingly, more education is associated with higher employment rates and fewer transitions out of employment. The important distinction is between having no qualifications and having qualifications of O-level or greater (within this group, all qualifications have similar effects). There is some evidence that the education gap shrinks among older people (especially women) as the better qualified withdraw from employment (probably because of better pension entitlements).

The effects of education are particularly strong among women and they are only partially eliminated after controlling for labour market history, family history, job strains and health. For women under 55, having qualifications is associated with about 15 percentage point higher employment probabilities (reducing to around six percentage points for the over 55s). For men, the effect of education is weaker and has an effect mainly via subsequent experience in the labour market – the more educated started work at a later age and have more stable employment. After taking these factors into account, there is little association of education with

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1 The professional group includes managers and administrators, large proprietors and supervisors of non-manual employees, as well as those in the 'professional' occupational groups.

2 Strictly speaking, the self-employed group includes all those in the 'petty bourgeoisie' class (farmers, small employers and self-employed non-professionals). The non-manual group includes sales personnel, routine non-manual employees in administration and commerce.

later-life employment prospects. The effect of education does not seem to be mediated by a man's main occupation or industry, unlike for women.

Adulthood events

Labour market entry and family formation

Later entry to the labour market is associated with higher employment levels after age 50. The effect of labour market entry is strengthened when we hold constant subsequent years of employment – possibly because workers entering the labour market late stay late to accumulate pension entitlements. A five-year delay in entry to employment (up to age 30)[3] is associated with nearly 20 percentage point higher employment rates among men and ten percentage point higher rates among women. For women, the age at which they enter employment partly determines their occupation and industry, which in turn, affects later employment outcomes.

Both men and women who form their first partnership at a later age (up to about 25 years) are more likely to be in employment after 50 and less likely to leave employment. A five-year delay in partnership formation is associated with seven to nine percentage point higher employment probabilities. However, a substantial part of this effect arises because earlier partnership formation appears to be related to poorer health in later life and poor health makes employment more difficult. We return to the mediating effects of heath below. For women, the partnership effect is also partly mediated by main occupation and industry. The age at which parents had their first child has similar effects to the timing of first partnership formation – starting a family later is associated with higher later-life employment probabilities. However, because partnership formation and having children are often closely spaced events, it is not possible to unambiguously separate their effects.

Perhaps surprisingly, there is little evidence that the timing of family events (after partnership and family formation) has an effect on later withdrawal from the labour market. We found no effects due to having children over an extended period, having had multiple partners or the timing of partnership dissolution. What seems to count is the timing of initial family formation (as well as getting established in the labour market).

People who never have children are less likely to be in employment after 50. Compared to those with small families, childless men are around six percentage points less likely to work after 50, while employment rates among childless women are 16 percentage points lower (controlling for previous employment history). There is some evidence that those with more than one child are more likely to

[3] While only a small proportion of the sample entered employment for the first time after 30, they had lower employment rates in later life. Hence, the model differentiated between those under and over 30.

be in work in later life. The results probably reflect the cost of raising children which delays and reduces pension saving. Parents of very large families are less likely to be in employment after 50 – this seems to be a consequence of their lower employment rates, and the resulting loss of experience and skills, when their children were young (these lower employment rates might, in turn, stem from lower labour market attachment or more home-centred preferences among these families).

Employment history

More years of employment before 50 are strongly associated with higher levels of employment in later life (by about 20 percentage points among men and ten points among women for an extra five years of employment). These associations largely remain when controlling for other factors, including current health. For men (and much less so for women) years of employment mediate previous educational attainment: being qualified leads to more stable employment and this favours later-life employment. There is some evidence that individuals who have changed jobs more often (holding constant years of employment) are more likely to be employed in later life, perhaps reflecting difficulties in carrying pensions across jobs. Periods of unemployment before 50 are associated with lower employment rates among men, with more distant unemployment spells having less effect. We do not find robust evidence of unemployment effects among women, in fact women who were unemployed in the past are slightly more likely to be employed in later life; this is probably a selection effect: non-working women reporting unemployment will tend to have more job-related resources than those reporting inactivity and be more attached to the labour market.

Men whose main occupation before 50 was in the professional, technical or administrative field work less in later life compared to those in the skilled trades (employment rates are around 15 percentage points lower). Women in the 'lower' occupations (especially retail and operative occupations) tend to work less compared to those in administration (by 15-20 percentage points). This gap closes after age 55 (similar to the education relationship) as women in these occupations tend to stay in employment for longer. The occupational pattern of women's employment mediates the effects of some previous events, notably educational achievement and the timing of partnership formation and labour market entry. In turn, occupation is related to subsequent health and thereby employment outcomes among older women. Compared to men, occupation is more important for women both as an explanatory factor and a mechanism through which other effects are felt.

Previous main industrial affiliation is a less important predictor of employment in later life, though again for women, it partly mediates the effects of early partnership and labour market entry.

Later-life events

Job strains and health

Women in jobs with less autonomy tend to work less in later life, and men in less satisfying jobs work less after 50. A one standard deviation increase in job strains is associated with three to four percentage point lower employment probabilities but it is difficult to disentangle these effects from the direct effects of belonging to particular occupations or industries. However, these job strains seem to act independently of overall health status and so appear to reflect a separate dimension of individual capability.

Being in poor health after 50 is very strongly associated with being out of employment already or with leaving employment. Typically, a one standard deviation decline in health is associated with around a ten percentage point lower employment probability and over a one percent higher chance of leaving employment year on year. Health mediates the effects of several earlier Life-course events. For both men and women, early partnership effects are reduced once we control for health status. Among men, early entry to the labour market and a lack of continuous employment are related to poor health and hence, to lower levels of later-life employment. Among women, rather than employment stability, it is their main occupation which is associated with later health status and hence, employment outcomes.

Other factors

The effect of a spouse's employment history on an individual's later-life employment is minimal. A spouse's **current** employment status is strongly correlated with an individual's employment – but causality probably runs in both directions since it is likely that spouses coordinate their retirement decisions. There is some evidence of a preference for spouses to retire together (though on aggregate, women retire before men).

After controlling for family and employment history and education, we find only a little evidence that having an occupational pension increases transitions out of work. However, our data on pension scheme membership are limited. We find stronger evidence that saving from income increases transitions for men.

We find some evidence that having received training in the last year is associated with fewer exits from employment among women (a two percentage point lower exit probability). The acquisition of new qualifications is associated with fewer exits among women and men but the estimates do not reach statistical significance. These correlations cannot be interpreted causally since individuals expecting to continue in work are more likely to seek, be offered and take up training.

Conclusions and implications

This study has found that both early life-course events and later mediating factors play a role in explaining employment outcomes after age 50, with marked differences in the relative importance of different factors between men and women. Given the long view taken by the analysis, specific implications for policy will probably depend on the policy timescale being envisaged. If the policy horizon is a few decades from now, intervention might focus on changing the 'characteristics' of those currently at the beginning of their careers. An example would be policy to increase educational achievement. On the other hand, if the focus of policy is more on the medium term, aiming at those already in their 50s or 60s, effective interventions may need to target the 'effects' of peoples' characteristics rather than the characteristics themselves – most of which were fixed earlier in life. An example might be trying to raise the current employability of those with patchy job records and low qualifications.

A persistent finding throughout the analysis is that becoming 'established' later in life is associated with a later end to one's career. This applies to the timing of a person's first partnership but especially to their age at labour market entry and the results generally remain even after controlling for subsequent life events (in particular for men). In addition, the possession of qualifications also favours later-life employment. While it is difficult to extrapolate from previous cohorts, our results suggest that raising education levels could favour extended careers, first by delaying labour market entry and second by reducing the proportion of those with low qualifications (who tend to exit early).

The analysis also highlights the importance of employment stability and occupational factors for later-life employment. Indeed, several earlier life events affect labour market withdrawal via their effect on a person's experience in the labour market. A person's employment history is in turn linked to later-life health status – a major factor in explaining early withdrawal from employment. This underlines the potential gains from addressing occupational health issues.

Finally, there are complementarities between partners' later-life employment behaviour and some evidence of a preference for retiring together. This suggests that if one partner extends their working life, there may be a secondary effect which extends the other partner's employment too.

The study raises several questions which might be addressed in future research: First, to what degree do life-course events affect labour market exit, specifically via their effect on pension saving? Second, do the effects of life-course events on labour market exit vary according to destination states, e.g. long-term sickness or retirement? Third, how do the effects of life-course events interact with individuals' preferences regarding labour market withdrawal (as a positive or negative event)? Investigating these issues will require more specific models of labour market withdrawal – for which the present study could be used as a baseline – as well as richer data covering pension savings and entitlements and retirement preferences.

1 Introduction

This research aims to investigate relationships between men's and women's life-course experiences and their employment trajectories in the ages of 50 to 70. The background for this project is that life expectancy has been increasing while the average age of permanent exit from employment fell during the 1970s, 1980s and much of the 1990s. As a result people can nowadays expect to receive pensions for 20 years compared to 12.5 years in 1970 (Pension Commission 2004). This clearly puts stress on the financing of pension programmes.

One solution to solving these pension finance problems is to encourage people to extend their working life. Developing appropriate policies to promote this requires some knowledge about what determines when people withdraw from employment. Much is already known about how factors measured close to the time of retirement affect when people exit work. More specifically, poor health and disability (e.g. Disney, Emmerson and Wakefield 2006), individual pension savings and pension entitlements (e.g. Blake 2004), and job characteristics such as physical strains and job autonomy (e.g. Blekesaune and Solem 2005) have all been found to predict when people withdraw from work.

Less is known about how various life-course events also affect employment in later age. Previous research has found a high degree of stability in people's labour market attachment before and after 50, which could indicate that labour market policies have a rather long-run impact on the economic activity of individuals (Cappellari, Dorsett and Haile 2005). A recent literature review (Phillipson and Smith 2005) has highlighted the need to understand more about early life-course factors including multiple life-course transitions, multiple forms of disadvantage and the formation of preferences for continued work compared to retirement. This research intends to fill some of these gaps using two sources of longitudinal data: the British Household Panel Survey (BHPS) and the Office for National Statistics Longitudinal Study (LS). The BHPS analysis includes supplementary data merged in from the Workplace Employment Relations Survey 2004 (WERS 2004).

Even if there is limited previous research on life-course events and later-life employment, some hypotheses can be derived from other lines of research. This includes research on intergenerational mobility (e.g. Savage and Egerton 1997;

Blane, Smith and Hart 1999) and research on education related to job skills or health (e.g. Becker 1964; Chandola *et al.* 2003). There is already some research on employment history related to pension entitlements (Bardasi and Jenkins 2004), on the long-term effects of teenage childbirth/motherhood (e.g. Goodman, Kaplan and Walker 2004), and on the effects of multiple partnership transitions (e.g. Barrett 2000).

The objectives of this research are to:

- investigate whether a longitudinal life-course approach can help explain the labour market position of people aged 50 and over;
- identify the main life-course events that affect work in later life and how these interact;
- explore whether there are multiple transitions or forms of disadvantage that affect labour market participation and understand how these interact; and
- investigate if the timing of life-course events affect labour market position after the age of 50.

The report is organised as follows: Chapter 2 outlines the data sources used, while Chapter 3 analyses the patterns of labour market withdrawal after age 50 in the BHPS and LS. Based on the patterns seen in Chapter 3, in Chapter 4 we define the outcome variables to be analysed and summarise how they are associated with potential predictors of withdrawal from employment. The next three chapters presents a multivariate analysis of employment outcomes, in which the influence of each predictor is isolated and compared to the effects of other life-course factors. Chapter 5 considers childhood events such as parental social class and education. Chapter 6 then examines adulthood events such as labour market entry, family formation and employment history. Chapter 7 explores later life events such as job strains and health and other factors such as partner's employment status, pensions and savings behaviour and training. Chapter 8 discusses the findings, draws some conclusions and suggests areas for further exploration.

2 Data sources

This chapter presents the two main data sources used the British Household Panel Survey (BHPS) and the Office for National Statistics Longitudinal Study (LS) and the supplementary data merged into the BHPS Workplace Employment Relations Survey 2004 (WERS 2004).

2.1 British Household Panel Survey

The BHPS is a random-sample panel survey of private households in Britain, established in 1991 and originally covering some 5,000 households. Every year the survey seeks to interview all adults (defined as individuals aged over 16 years) from the original sample, as well as all other adult members of their current households. The panel is, therefore, replenished in each wave by original sample members who reach the age of 16 and by adults who join the survey due to the changing composition of original sample members' households. All individuals included in the analysis belong to the original sample of the BHPS from 1991. We use the first 14 waves of data covering the period 1991-2004.

For the purposes of this report, data on employment are investigated by the current age of the respondent in each wave (or year) of the BHPS. The unit of the analysis is the individual, who can be observed in up to 14 waves which are approximately one year apart. Altogether, 4,471 individuals are investigated in 28,053 combinations of waves and individuals (labelled observations) when aged 50-70 years. No weights have been applied in the analysis given that the BHPS design employs equal probability sampling; further, non-response is typically determined by similar variables to those already included in the multivariate analysis.

As well as asking questions in every wave about respondents' current circumstances, the BHPS has also collected retrospective data about their employment history since leaving full-time education and about their history of marriage/cohabitation and fertility. By combining the retrospective information with that collected during the panel, we can examine how previous family and employment events influence later employment outcomes.

2.2 Office for National Statistics Longitudinal Study

The LS is a database that links Census and vital events data on the same individuals from the Censuses of 1971, 1981, 1991 and 2001 for one per cent of the population of England and Wales. We can, thus, investigate the employment status or family situation of each individual, known as LS members, in four consecutive Censuses. For LS members, and for people enumerated in their household, the LS contains Census information such as age, sex, marital status, economic activity, occupation and social class, education and limiting long-term illness (1991 and 2001).

The analyses presented here include people who were 50-70 years in the last 2001 Census and who were also successfully linked with the previous Censuses. The analysis of employment patterns by age in Chapter 3 includes all those being successfully linked in the Censuses of 1991 and 2001, and has a net sample of 126,500 LS members. The main analysis in Chapter 4 includes those also linked in the Censuses of 1971 and 1981, and has a net sample of 100,500 LS members. Because of its much larger sample size, this analysis of the LS allows to describe the data in more detail than the previous BHPS analysis. This data source has, on the other hand, less information about each individual than the BHPS.

2.3 Workplace Employment Relations Survey 2004

The WERS 2004 is the fifth in a series of surveys based on representative samples of British workplaces. In the last two surveys (1998 and 2004), as well as collecting information from management and worker representatives, questionnaires have been issued to up to 25 workers within each workplace. This allows individual level data to be linked to workplace information. WERS 2004 covered workplaces with five or more employees, achieving a sample of 2,295 workplaces and 22,451 individual worker responses.

For the purposes of this project, the advantage of WERS 2004 is its coverage of workers' experiences in the workplace. We are particularly interested in deriving measures of job strains. Using the WERS 2004 questions detailed in Appendix D, we construct measures of job stress, job autonomy and job satisfaction and then link this data to the BHPS by occupation. Appendix D gives details of the linking procedure.

3 Labour market outcomes and withdrawal

This chapter takes a first look at the data to give an overview of the labour market status of older individuals and to see (using the British Household Panel Survey (BHPS)) the process of labour market withdrawal (for example, is the transition once and for all, and do hours of work fall before eventual withdrawal?).

3.1 BHPS analysis of labour market outcomes

At each wave, respondents in the BHPS are asked about their current economic activity. In this analysis answers are collapsed into six groups: employed (including self-employed and participating in a governmental training scheme), long-term sickness/disability, unemployed, retired, looking after family or home (including maternity leave) or other (not specified, which also includes studying).

Table 3.1 Employment status among people aged 50-70, in percentages (BHPS)

	Men	Women	Total
Employed	55.4	41.1	47.8
Unemployed	4.0	1.5	2.7
Sick/disabled	8.3	5.5	6.8
Home/family	0.3	13.7	7.3
Retired	30.8	37.5	34.3
Other	1.2	0.8	1.0
Number of observations	13,320	14,773	28,053
Number of people	2,129	2,342	4,471

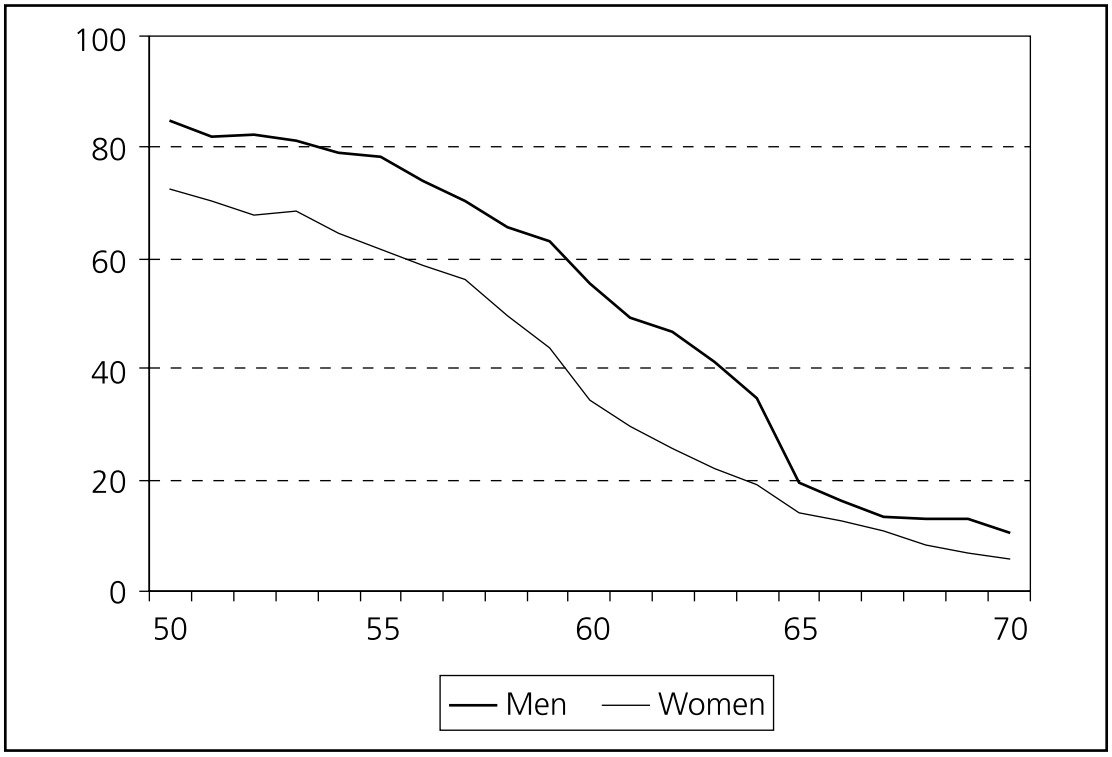
Table 3.1 shows that 48 per cent of 50-70 year olds were employed, although this proportion was larger among men than women (55 per cent compared with 41 per cent). Thirty-four per cent reported being retired and this proportion is larger among women (38 per cent) than men (31 per cent). About seven per cent

were sick or disabled. Some 14 per cent of women (but very few men) reported themselves as caring for home and family. This category should include most full-time 'carers', provided they define their main activity as caring for dependent relatives. Three per cent regarded themselves as unemployed; a majority of them were men.[4] A major proportion of the other category (one per cent of the sample) were full-time students.

3.1.1 Employment status by age

How does employment status change over the years when most people exit employment? Does it vary between men and women? Employment rates are higher among men than women throughout the 50 to 70 age interval as indicated by Figure 3.1. The gender gap is comparatively large between 60 and 65 years, when women but not men can receive the State Pension and comparatively small after 65 when both men and women can receive State Pensions. Among men, employment rates fall from above 80 per cent among those in their early 50s to 20 per cent by age 65 with a very steep fall from 64 (35 per cent) to 65 years (19 per cent). Among women, employment rates fall more gradually from 70 per cent in the early 50s to 14 per cent by 65. The largest fall is between 59 (44 per cent) and 60 (34 per cent).

Figure 3.1 Employment by age and sex (1991-2004), in percentages (BHPS)



[4] This number is not directly comparable with official unemployment rates which only includes those actively searching for a job and which is expressed as a proportion of the labour force.

Unemployment is higher among men than women in all age groups, as indicated by Figure 3.2. From 50 to 64 years, about five per cent of the male population were unemployed. Women have only half the unemployment rate of men between the ages of 50 and 60. Unemployment falls to almost nothing when reaching State Pension age for both men and women, indicating that social security systems do affect how people assess their labour market status.

The number of people not working as a result of sickness or disability increases with age up to the age they can receive State Pensions, indicated by Figure 3.3. This proportion rises from about seven at age 50 to about 12 per cent among those in their late 50s. It then falls rapidly at age 60 for women and at age 65 for men. Fifteen per cent of the men are sick or disabled at age 62-63.

Figure 3.2 Unemployment by age and sex (1991-2004), in percentages (BHPS)

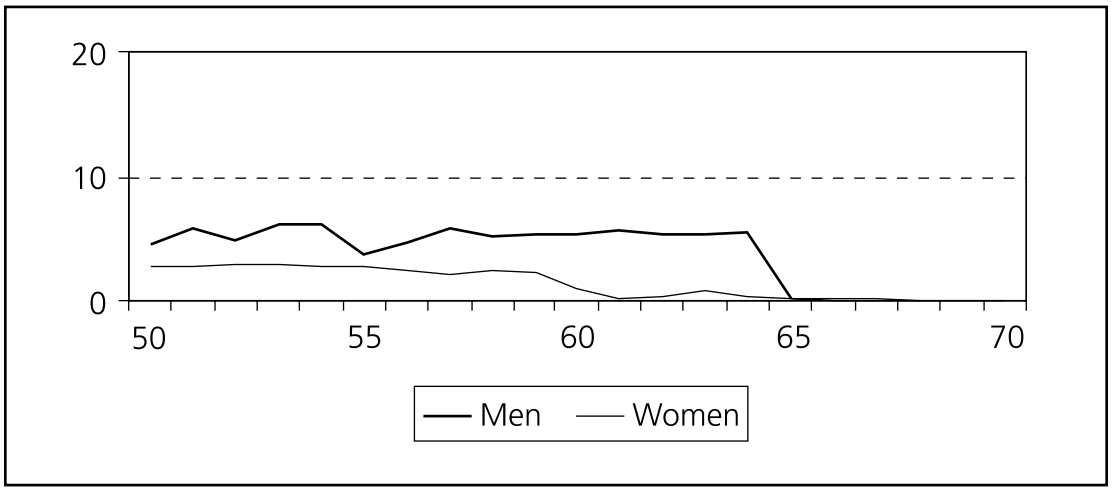
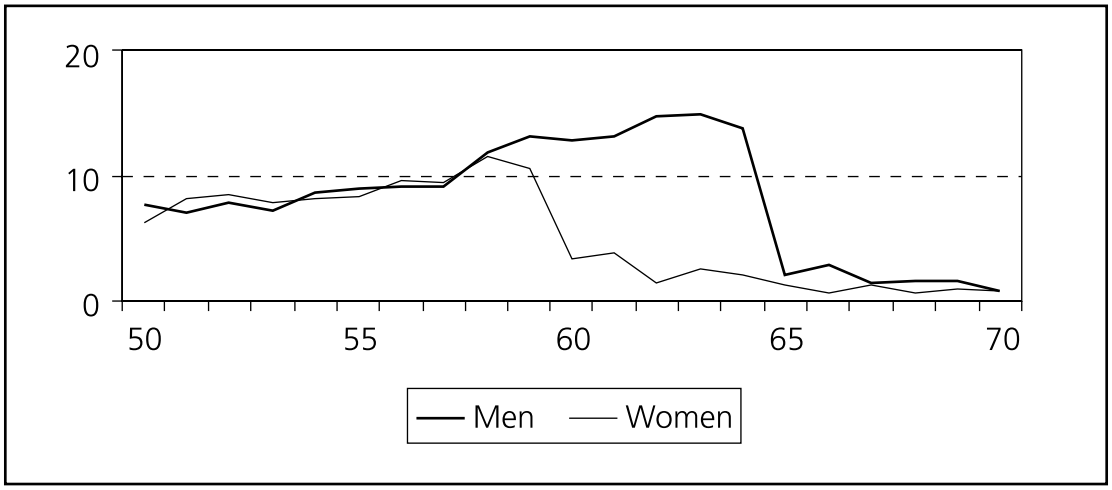
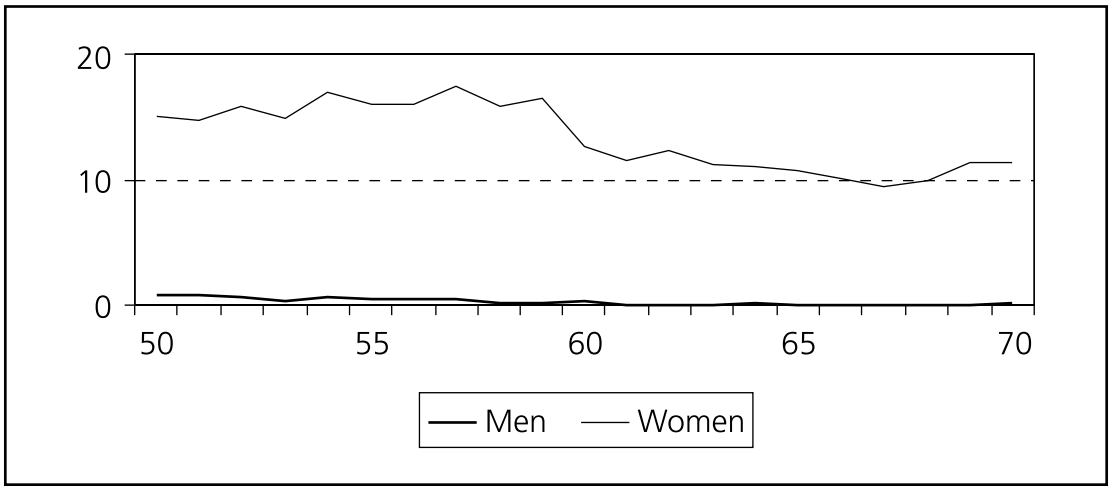


Figure 3.3 Long-term sickness or disability by age and sex (1991-2004), in percentages (BHPS)



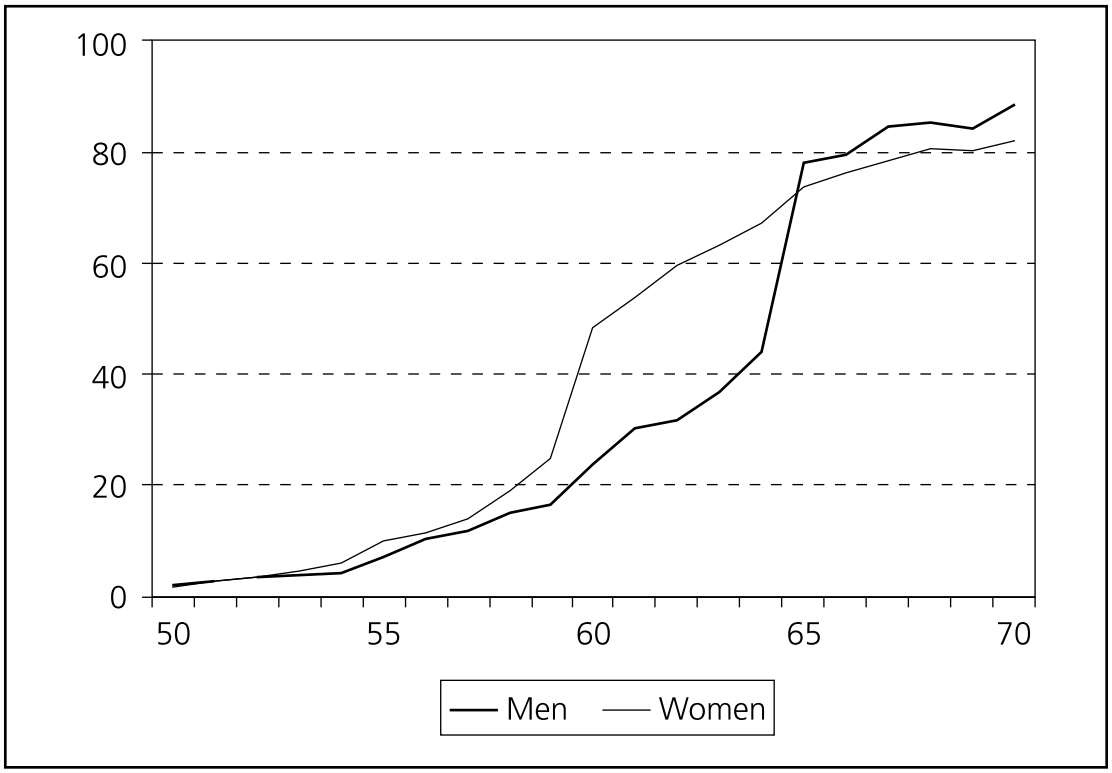
Looking after family or home is common among women in this age group, as indicated by Figure 3.4. In their 50s about 16 per cent of all women reported looking after family or home as their current situation. This rate falls by four percentage points when reaching State Pension age and remains at just above ten per cent throughout their mid and late 60s.

Figure 3.4 Care for home and family by age and sex (1991-2004), in percentages (BHPS)



A small percentage considers themselves to be retired even by the age of 50. This percentage increases between the ages of 50 and 59 and increases hugely at age 60 for women and at age 65 for men, when commencing State Pension age, as indicated by Figure 3.5. Similar proportions of men and women report being retired when still in their 50s but more women than men retire between the ages of 60 and 65. After 65, more men than women see themselves as retired, seemingly because some women in this age band report taking care of home and family as their main activity.

Figure 3.5 Retirement by age and sex (1991-2004), in percentages (BHPS)



3.1.2 Transitions out of employment

Are transitions out of employment permanent exits out of work for people in their 50s and 60s? Does this vary by where they initially move: into unemployment, long-term sickness/disability, family/home, or retirement?[5] How many move back to employment in subsequent years? Altogether, 1,145 people aged 50-70 moved from employment in one wave to another economic activity in the subsequent wave[6], evenly distributed between men and women (Table 3.2).[7] The largest group, 61 per cent, moved directly into retirement. The second largest group, 18 per cent, moved into unemployment, whereas 11 per cent moved into long-term sickness or disability. All these three groups are larger for men than for women. Among women, the second largest group (18 per cent) moved from employment to looking after family or home, whereas 13 per cent became unemployed and another ten per cent became long-term sick/disabled.

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5 Notice that this analysis only includes current economic status at the date of interview in each wave. Some people may have been employed for a short period between waves which would not show up in this analysis.

6 When the same person made transition from work two or more times, only the first is investigated here.

7 For simplicity of the presentation, the 'other/studying' group is removed from this analysis.

Table 3.2 Transitions from employment to other economic position between pairs of waves, in numbers and percentages (BHPS)

	Men		Women		Total	
	N	%	N	%	N	%
Unemployed	130	24	78	13	208	18
Sick/disabled	73	13	57	10	130	11
Family/home	3	1	109	18	112	10
Retired	345	63	350	59	695	61
Total	551	100	594	100	1145	100

How permanent are these transitions out of employment? This varies between the types of labour market withdrawal originally made. A relatively large proportion of those becoming unemployed moved back to employment in subsequent years. About half of this group were employed in each of the following four waves, as indicated by the first line in Table 3.3. The other half were either still unemployed or economically inactive in following years. Twenty-four per cent were still unemployed in the following wave but this proportion fell to eight per cent three years later. Six to eight per cent classified themselves as sick or disabled in following years. A small percentage was taking care of home and family. Seventeen per cent classified themselves as retired the following year and this proportion increased to 29 per cent three years later. In short, this analysis shows that about one-half of older workers entering unemployment move out of employment for a relatively long period of time (up to five years).

Table 3.3 Transitions from employment to unemployment by economic position in consecutive waves, in percentages (BHPS)

	1st wave	2nd wave	3rd wave	4th wave	5th wave	6th wave
Employed	100	0	49	52	53	53
Unemployed	0	100	24	17	12	8
Sick/disabled	0	0	6	7	8	7
Family/home	0	0	3	3	6	4
Retired	0	0	17	22	21	29
Total	100	100	100	100	100	100
Number	208	208	183	160	145	142

Only a small proportion of those moving from employment to sickness or disability re-entered employment in consecutive years; about one-sixth was employed in each of the subsequent waves (Table 3.4). The vast majority remained sick/disabled with an increasing proportion classifying themselves as retired. The proportion seeing themselves as sick/disabled fell from 56 per cent in the following year to

43 per cent three years later, whereas the proportion regarding themselves as retired increased from 19 per cent to 39 per cent. Negligible proportions were unemployed or taking care of home and family. In summary, becoming 'long-term' sick or disabled after age 50 is most typically the beginning of a process of permanent exit from work.

Table 3.4 Transitions from employment to sickness/disability by economic position in consecutive waves, in percentages (BHPS)

	1st wave	2nd wave	3rd wave	4th wave	5th wave	6th wave
Employed	100	0	16	18	18	16
Unemployed	0	0	6	3	0	1
Sick/disabled	0	100	56	47	46	43
Family/home	0	0	3	4	1	1
Retired	0	0	19	28	34	39
Total	100	100	100	100	100	100
Number	130	130	101	94	82	77

Out of those, largely women, moving from employment to looking after family or home, about one-fifth was employed in each of the four consecutive waves (Table 3.5). Half of these people were looking after family or home also one year later, falling slightly over the next few years. Only a small percentage classified themselves as unemployed or sick/disabled in the following years. An increasing proportion regarded themselves as retired, rising from 26 per cent in the following year to 35 per cent three years later. Taken together, moving from employment to care for home and family is, for a majority of those aged above 50, a permanent move out of employment.

Table 3.5 Transitions from employment to looking after family or home by economic position in consecutive waves, in percentages (BHPS)

	1st wave	2nd wave	3rd wave	4th wave	5th wave	6th wave
Employed	100	0	19	23	21	19
Unemployed	0	0	2	2	1	2
Sick/disabled	0	0	2	1	0	0
Family/home	0	100	51	48	49	44
Retired	0	0	26	25	28	35
Total	100	100	100	100	100	100
Number	112	112	94	81	71	62

Table 3.6 Transitions from employment to self-assessed retirement by economic position in consecutive waves, in percentages (BHPS)

	1st wave	2nd wave	3rd wave	4th wave	5th wave	6th wave
Employed	100	0	9	10	9	11
Unemployed	0	0	1	1	1	0
Sick/disabled	0	0	3	2	2	2
Family/home	0	0	3	3	2	3
Retired	0	100	84	84	86	84
Total	100	100	100	100	100	100
Number	722	722	630	563	504	455

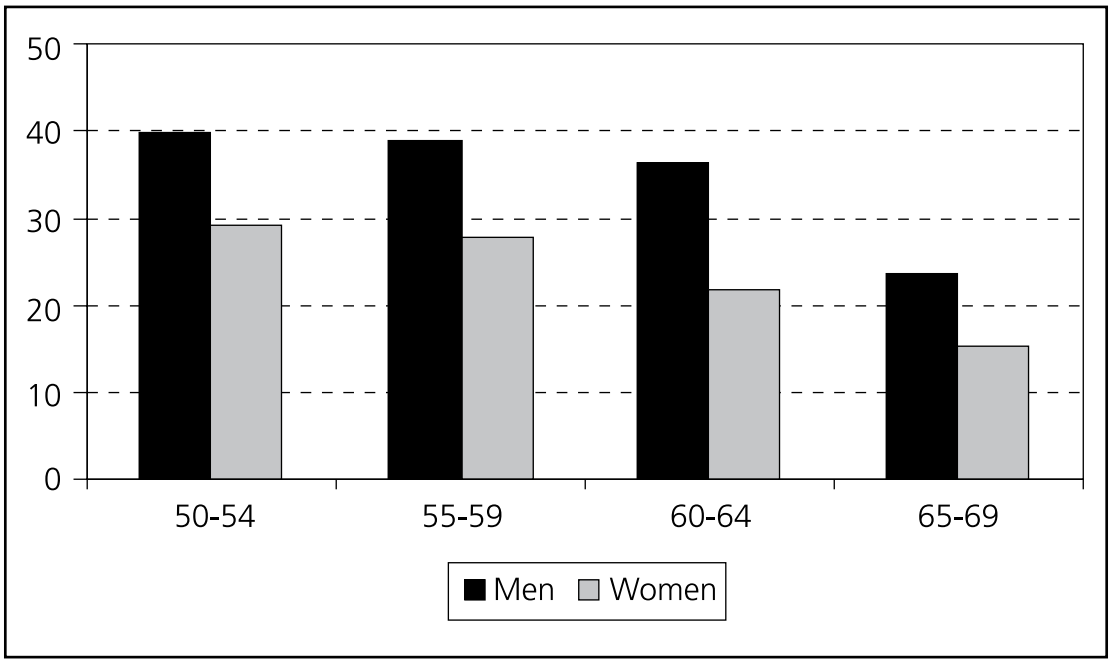
Finally, how permanent are more direct transitions from work to self-assessed retirement? In most cases this transition is a permanent one. About ten per cent were employed in each of the following four waves (Table 3.6). But this proportion is similar to that for transitions into sickness and disability. Thus, transitions into retirement and sickness/disability have about the same probability to be permanent transitions out of work. The vast majority also remained retired in the following waves, about 85 per cent in each. A small proportion move into sickness/disability or care for home and family and even fewer become unemployed.

Taken together, those leaving employment to unemployment have the best prospects of moving back to work. A minority of those leaving work to take care of home and family as a main activity also move back to work but only a few of those moving into long-term sickness, disability or self-assessed retirement are working in subsequent years.

3.1.3 Hours worked before exiting work

How does the number of hours worked vary by people's age and how does it change over the years preceding labour market withdrawal? This issue would determine how labour market withdrawal should be investigated. Should it be investigated as a once-and-for-all exit or as a more gradual withdrawal from work? Another purpose is to indicate what kind of labour market policies could help extend working life among older workers. Would people work for more years if they were allowed to work fewer hours per week before exiting employment? Or would post-retirement jobs, the option of working some hours every week after taking up a pension, be a more promising way of increasing employment and work among older people? Hours worked is defined as normal hours of work in the main job (excluding overtime and time in a second job).

Figure 3.6 Number of hours by age and gender (BHPS)

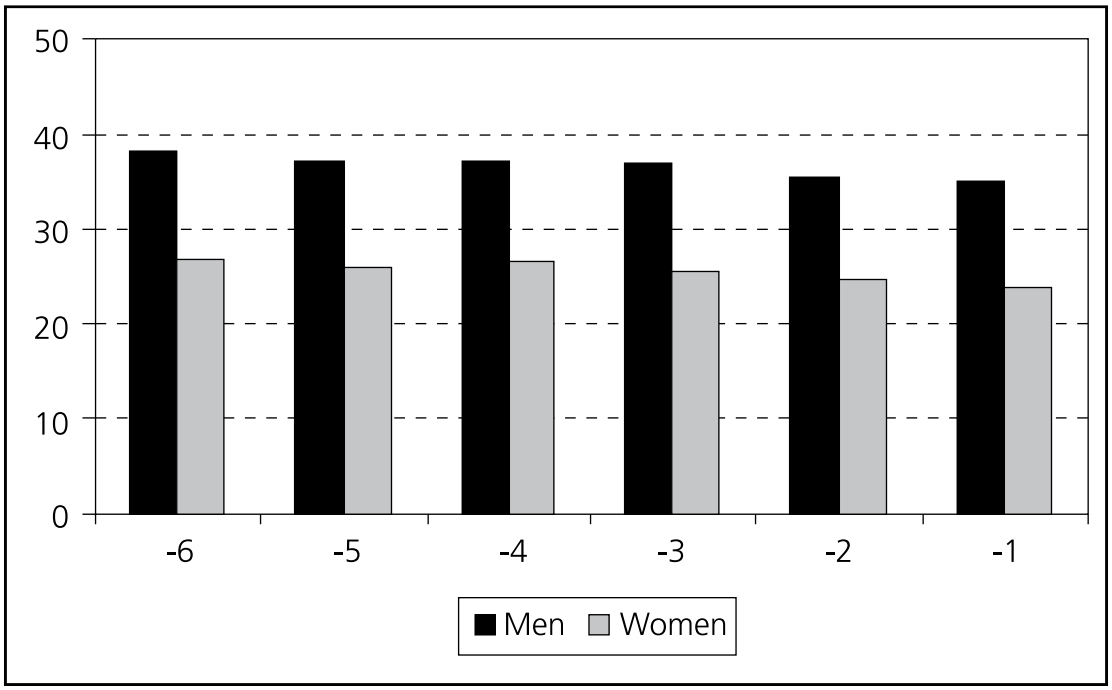


There is a clear tendency for older workers to work fewer hours than middle-aged workers, as indicated by Figure 3.6. The main change appears during people's 60s. In their early 50s, men work, on average, 40 hours per week whereas women, 29 hours. The number of hours worked does not change very much before men and women reach their respective State Pension ages, 60 for women and 65 for men.

But does this reflect people reducing their working hours gradually year by year till they eventually exit altogether? Or do they work more or less normal hours until they exit, with longer hours workers exiting first? This issue is investigated in this section by examining current hours of work in each wave before a first exit is recorded. Exits are transitions from employment in one wave into sickness/ disability or retirement in the next and being non-employed in a third wave (when a third wave is observed in the data).

Hours worked decrease only marginally in the years prior to employment exit (Figure 3.7). Among men, the number of hours worked decreases from 37 hours per week, three to five years prior to retirement, to 35 hours the year before they retire. Among women the number of hours decreases from 27 hours per week, three to five years before, to 24 hours per week in the year immediately prior to labour market withdrawal.

Figure 3.7 Number of hours in 1 to 5 waves before an exit from work has occurred (BHPS)



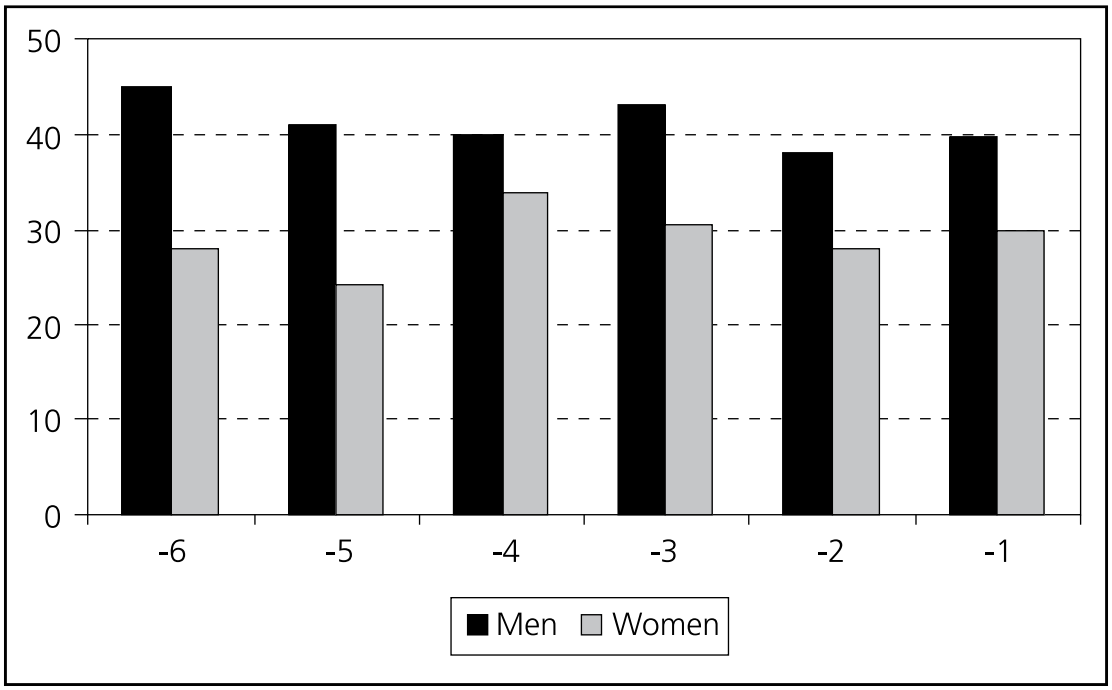
The general pattern, therefore, is one of a very slight and gradual decrease in the number of hours worked over a number of years before retirement. On average, the number of hours worked per week decreases by about 0.6 hours between each of the six years preceding retirement, for both genders. Thus, we find little evidence that people adapt to their retirement by reducing the number of hours worked gradually over the years immediately before they leave the labour market.

3.1.4 Preferences for hours worked

Even if most people do not reduce their working hours in the years preceding withdrawal from employment, it is possible that some people would prefer to do so but are unable to because of employer or institutional constraints. It is even possible that some people may retire earlier than they wish because they are not able to reduce the number of hours worked as much as they would like.

The BHPS contains responses to a question asking employees if they would like to work more or less than they do: *'Thinking about the hours you work, assuming that you would be paid the same amount per hour, would you prefer to (1) work fewer hours, (2) work more hours, or (3) continue with the same number of hours?'*.

Figure 3.8 Percentages who want to work fewer hours over the years preceding labour market withdrawal (BHPS)



Somewhat surprisingly, there is no tendency among employees to want to work fewer hours over the years before they exit employment, as indicated by Figure 3.8. This analysis also reveals that more men than women report that they would like to work fewer hours perhaps because male employees work more hours than female employees.

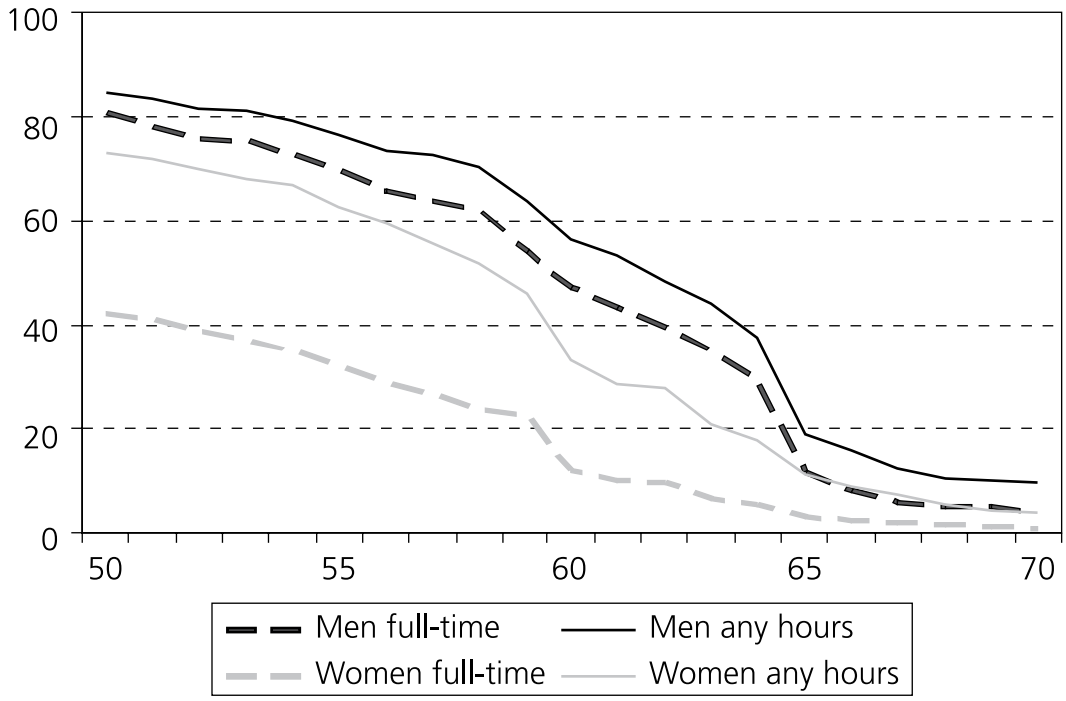
3.2 LS analysis of labour market outcomes

This section briefly examines the employment outcomes among the 2001 Census LS members aged 50-70 and compares them to the BHPS.

We distinguish here between full- and part-time employment (30 hours or more compared to less than 30 hours per week). A much higher proportion of men than women work full-time, as indicated by Figure 3.9. The proportion of women working part-time increases over the 50-70 age band from under half of all working women in their early 50s to about three in four by the late 60s. This can be seen by examining the relative size of the gap between the proportion working any hours and the proportion working full-time: at age 50 the difference is 30 percentage points, compared to a total employment rate of 73 per cent, while at age 70 the difference is three percentage points, compared to a total employment rate of four per cent. Only a few per cent of employed men work part-time in their early 50s but about half of all employed men work part-time at ages above 65. This simple analysis thus indicates that part-time work is important for extending working life among older workers.

When comparing the two graphs we find that even if employment rates fall during people's 50s (Figure 3.9), comparatively few regard themselves to be retired before 60 years of age (Figure 3.10). Another striking result in this analysis in Figure 3.10 is the apparent tendency to reclassify oneself as retired rather than sick or disabled when reaching State Pension age. Otherwise, very similar proportions of men and women classify themselves as either sick/disabled or as retired except for the huge difference which occurs as a result of different ages of State Pension age for men and women.

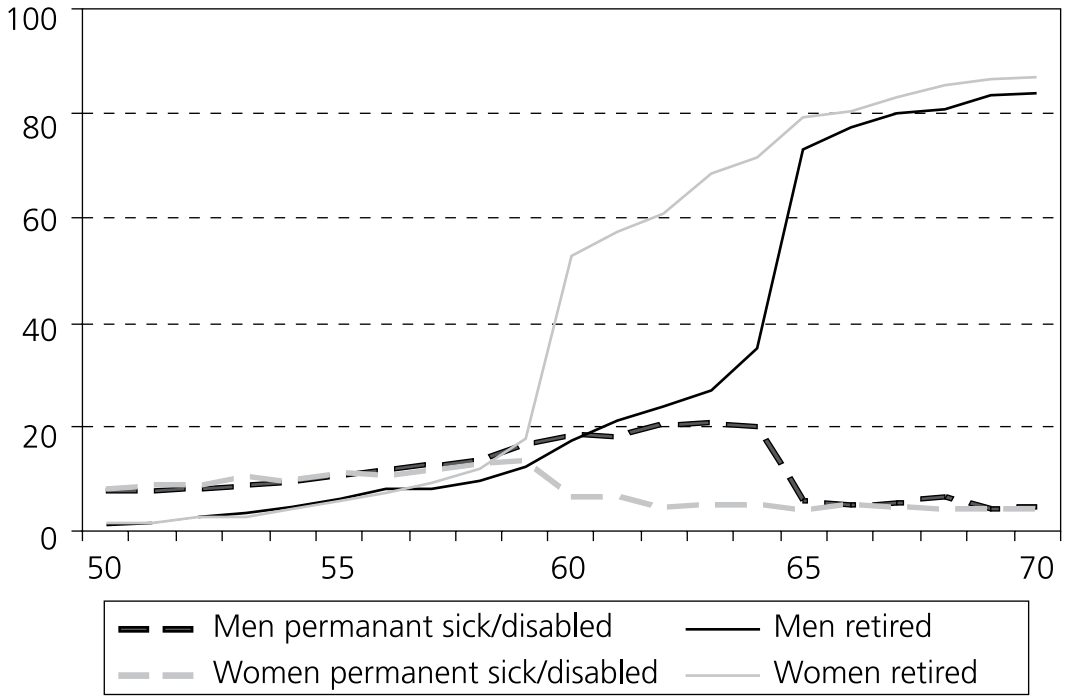
Figure 3.9 Employment by age and gender in the 2001 Census, percentages (LS)



Source: ONS LS. Authors' analysis.

When comparing the analysis using the LS for 2001 with that using the BHPS for 1991-2004 we should keep in mind that unemployment rates fell and employment rates increased from the mid 1990s to 2001. Otherwise, employment rates show a similar picture by age and gender in the LS (Figure 3.9) as for the BHPS (Figure 3.1). Also, the proportions classifying themselves as either permanently sick/ disabled or as retired are similar in the two data sources (Figure 3.10 and Figure 3.3 and 3.5).

Figure 3.10 Permanently sick/disabled and self-assessed retired by age and sex in the 2001 Census, percentages (LS)



Source: ONS LS. Authors' analysis.

4 Predictors of later-life employment and labour market withdrawal: descriptive analysis

The unique contribution of this research is the investigation of how far early and mid life-course events can predict how long people remain in the labour force and their participation in later life. But these early life-course predictors need to be investigated in conjunction with later situations close to retirement, since the latter can explain the mechanisms by which life history variables predict when people withdraw from work. In this chapter, we summarise the basic relationships between employment in later life and previous events, both early in life and closer to retirement. These results are based on a set of statistical (probit) models which treat each life event separately. Apart from a standard set of control variables, the results for each predictor do not take account of other confounding factors which may also influence later-life employment. We leave this analysis until Chapters 5-7. Our purpose here is simply to highlight those life-course events in the 'raw' data which stand out as important predictors of employment outcomes.

Although little is known about how early life events may affect employment in later life, some hypotheses or implications can be made from theory and previous life-course research. For example, there is a considerable body of research on intergenerational mobility demonstrating correlations between job and occupational status of parents and children when they eventually grow older (e.g. Savage and Egerton 1997; Blane, Smith and Hart 1999). Education level has implications for what kind of jobs people will get and the demand for their work by employers. Education level is also correlated with health (e.g. Chandola *et al.* 2003) and could even be correlated with preferences for work in the first place since education is typically an investment into job-related skills (Becker 1964). Family history has implications for employment history and eventually for pension entitlements of older workers, particularly for women (Bardasi and Jenkins 2004).

In the UK and the USA there has been much public and academic debate over the possible effects of teenage childbirth/motherhood, in part because of comparatively high levels of early life motherhood in these countries (e.g. Goodman, Kaplan and Walker 2004). Particularly in the USA, there has also been some interest in the effects of multiple partnerships or perhaps multiple partnership dissolutions (e.g. Barrett 2000).

Previous research has found at least three types of more immediate predictors that affect when people exit from work: (1) poor health and disability (e.g. Disney, Emmerson and Wakefield 2006); (2) individual pension savings and pension entitlements (e.g. Blake 2004) and associated financial incentives (Gruber and Wise 1999); and (3) job characteristics such as physical strains and job autonomy (e.g. Blekesaune and Solem 2005). Also late stage family characteristics may affect when people withdraw from work. But these effects are more difficult to predict from theory, except perhaps the issue of care-giving (i.e. for a partner) which is likely to reduce employment or working hours among older workers.

Following on from these previous studies, the aim of this section is to assess, in turn, the importance of each of these factors. These results are then used as a guide to the multivariate modelling strategy in the next chapter. Using the BHPS, we focus on two aspects of labour market attachment and withdrawal: (1) being employed or not at the time of the interview; and (2) transitions out of employment. Although our initial investigations into labour market withdrawal in Chapter 3 showed that reducing hours was not a common route out of employment, we also looked at total hours worked. As expected, the results were very similar to the analysis of employment status (employed or not) and so for clarity we omit them here. The distribution of the two dependent variables plus the standard set of explanatory variables used in all empirical analyses of the BHPS, are summarised in Table 4.1.

Table 4.1 Descriptive statistics for people aged 50-70, mean values or percentages (BHPS)

	Men	Women	Minimum	Maximum
Dependent variables				
Employed or not	55.4%	49.7%	0	1
Exiting employment	6.0%	8.1%	0	1
Statistical control variables				
Age	59.0	59.3	50	70
State pension age	23.7%	46.8%	0	1
Married/cohabiting	83.1%	70.5%	0	1
Widowed	3.2%	14.0%	0	1
Divorced/separated	7.8%	10.4%	0	1
Never married	5.9%	5.1%	0	1
Number of observations	13,320	14,773		
Number of people	2,129	2,342		

Employment is defined as self-assessed economic status (including self-employed and participating in a Government training scheme). A labour market exit is defined as occurring in two cases: (1) when someone moves from employment in one wave (t) to either retirement or long-term sickness/disability in the subsequent wave (t+1) and they remain out of employment in any subsequent (t+2) wave or if no further wave is observed; (2) when someone moves from employment to either unemployment or looking after family and home and have not moved back to employment in any of two subsequent waves (or if these waves are not observed). We are, thus, treating long-term sickness/disability and self-assessed retirement similarly but differently from unemployment and looking after family or home. One reason is that many people switch between being retired and long-term sickness/disability; another is that exits to sickness/disability appear to be at least as permanent as retirement. In particular the unemployed but also people looking after family or home, are more likely to move back to work later on. When the timing of exiting employment cannot be determined, later observations were set to missing (defined as censored). People are observed as long as we know they are employed (at risk of exiting employment) but they are no longer observed when we cannot say when an exit occurred. This is the case if there are non-observed waves between employment and later non-employment (exit) or if people have only one observation. Notice that people can have two or more spells of employment that could lead to one, two or even three transitions from employment. This would be the case of someone was working in one spell and being retired or long-term sick in the following wave but returning to employment in some later waves. This would also be the case if someone was working in one spell and non-employed for reasons other than retirement or long-term sickness in at least two waves but returning to employment in some later waves. The vast majority have only one withdrawal from employment, however.

The LS data structure is different to the BHPS since individuals are only observed at the four Census points: 1971, 1981, 1991 and 2001. We clearly cannot observe year-on-year employment transitions in the LS; instead we look at transitions out of employment between 1991 and 2001. Our dependent variables are: (1) employed or not in 2001 and (2) transitions from employment in 1991 to non-employment in 2001. Table 4.2 shows the means and proportions for these variables and for the control variables used in each equation.

Table 4.2 Descriptive statistics for people aged 50-70 and linked in all Censuses from 1971 to 2001, percentages (LS)

	Men	Women
Dependent variables		
Employed or not 2001	55.5%	41.4%
Exiting employment 1991-2001	37.4%	45.7%
Statistical control variables		
Age	59.2	59.2
State pension age	24.1%	46.4%
Married/cohabiting	82.8%	73.5%
Widowed	3.1%	11.5%
Divorced/separated	8.2%	7.4%
Never married	6.5%	4.2%
Number of people	48,594	51,924

Source: ONS LS. Authors' analysis.

Tables 4.3 and 4.4 summarise the associations between the different predictors and employment status after age 50, as shown by models (not reported) estimated separately for each predictor. As already mentioned, the relationships are essentially bivariate (with the addition of the standard age and marital status controls) and they do not account for the way in which different life-course events may interact – we leave this to the main analysis of the next chapter. The models were also estimated separately for men and women.

Overall, and perhaps surprisingly, there is not much association between a person's parental background and their employment situation in later life. The only noteworthy effect is that of parental social class on men's employment status. By contrast, later-life employment is strongly associated with a person's education level and also age at entering work. These factors are themselves related as many young people face a choice between continued education and paid work. Clearly, therefore, education level and age of entering work should be studied together, as we discuss when presenting the multivariate model below. Both factors are also related to type of jobs people have and associated job strains. Age of entering work is also related to family formation processes and general attachment to work, perhaps for women particularly.

Table 4.3 Associations between life-course predictors and employment after 50

Predictor	Association with employment and transitions out of employment
Had lone parent at age 14	Little association.
Father not working at age 14	Little association.
Parental social class	Men: higher employment rates if father in non-manual occupations, especially routine non-manual and petty bourgeoisie. Women: little association.
Education	Higher employment rates associated with qualifications of O-level or greater; stronger relationship for women.
Number of previous partnerships	Little association with employment rates or transitions.
Age entering first partnership	Later partnership formation (up to age 25) associated with higher employment rates and fewer transitions out of employment.
Number of children	Having one to three children associated with higher employment rates; smaller (or slightly negative) effects for larger families.
Age had first child	Having children at a later age (up to age 25) associated with higher employment rates.
Age had last child	No association.
Age entered employment	Later entry to employment (up to age 30) associated with higher employment rates.
Number of years employed/ unemployed before age 50	More years of employment associated with higher employment rates. Previous unemployment associated with lower unemployment rates for men but not for women.
Occupation of longest job	Men: little association. Women: lower employment rates among manual occupations.
Industry of longest job	Higher employment rates in agriculture and energy/water sectors. For women, higher employment rates also in banking and 'other' services.
Previous health	Previous experience of work interruptions due to disability associated with lower employment rates, and more exits from work.

Notes: based on separate probit models for each predictor. Additional controls are age and marital status.

Years of employment are generally positively associated with employment in later years and more so in women than in men. To some extent, this could reflect that some people have experienced poor health and disability for several years. All measures of poor health and/or disability investigated are strongly associated with low employment and early exits from employment. People who have experienced long-term sickness/disability in previous periods of their life are also much less likely to be employed in later life and more likely to exit if entering employment later on. It could also reflect general labour market attachment. People who have experienced unemployment in earlier life are less likely to be employed in later life and this effect is stronger for men than women.

The number of previous partnerships is not associated with employment in later life but the age entered a first partnership is. The same is true for age when having a first child. Men and women who started a process of family formation at a very early age are less likely to be employed in later life. Somewhat surprisingly, these associations are generally as strong for men as for women; they do not appear to reflect female life courses specifically. Obviously, these factors need to be investigated concurrently. The relationship between the number of children shows a curvilinear relationship with later-life employment: men and women with two children are most likely to be or remain employed, whereas both more and fewer children are associated with lower employment rates in later life. Clearly, it is important to investigate to what extent these family size effects are reflecting, say, labour market attachment or health status.

Table 4.4 Associations between more immediate predictors and employment after 50

Predictor	Association with employment and transitions out of employment
Current health	Poor health associated with lower employment rates, and more exits from employment. Stronger effects for men.
Pension entitlement and savings	Having occupation pension and saving from current income associated with higher transitions out of employment. Effect stronger for men.
Job strains (before age 60)	Less job autonomy associated with lower employment rates, and more exits, especially for women. Lower job satisfaction associated with lower employment rates among men.
Current marital status	Employment rates lower among never married and divorced/ separated men.

Notes: based on separate probit models for each predictor. Additional controls are age and marital status.

Labour market withdrawal seems higher among women in manual occupations, while we find little effect among men. Occupational choice for women may reflect family formation processes and consequent labour market attachment, so these factors need to be investigated together. There is also some variation in later-life employment according to past industrial affiliation, however, this could reflect industrial change over recent years and thus, be specific to the historical period investigated. Some additional evidence of effects related to occupation and industry is that women working in low autonomy jobs are much more likely to exit employment early than women working in more autonomous occupations. Among men, early exit is more strongly associated with how people in various occupations rate their job satisfaction.

In summary, we find several statistical associations between life-course events and employment in later life worth further investigation. But they do not always occur where expected (e.g. not associated with employment problems among parents) and when expected statistical associations are found, they do not always

arise in the expected way (e.g. the striking similarity in the effects of the early process of family formation for men and women). The relationships between various types of life-course events (e.g. education level, early family formation and years of employment) need further elaboration before any appropriate policy recommendations can be made. Policy recommendations should also wait until we know how far the associations between life-course events and later-life employment are mediated by factors that can be measured close to the time of labour market withdrawal such as poor health/disability, job strains and pension entitlements. This is the focus of the next three chapters.

5 Childhood events and later-life employment: multivariate modelling

5.1 Empirical approach

The descriptive analysis reported in Chapter 4 investigated how the employment of older workers is related, on the one hand, to long-term life history measures, and on the other hand, to shorter-term pre-retirement measures. Examining each of these factors separately from one another revealed several interesting findings, as well as some puzzles – for example, the apparently similar effects of family formation among men and women. In this and the following two chapters, we outline a modelling strategy to examine how the effects of the different life-course factors relate to each other and to assess the extent to which the effects of earlier life-course events are mediated by factors closer to retirement. The analysis addresses the following broad themes and questions:

- Education and the age of first entering work are both related to employment in later years. Do they act independently or is there a dominant factor? Both factors may also be related to job strains and occupation more generally, and especially for women, to the family formation process. Do education and age of labour market entry still have an effect after allowing for these later events?
- Individuals with a history of strong labour market attachment (more years of employment and fewer years of unemployment) are more likely to be employed later in life. Is this because these workers have better qualifications and other job-related skills than those with weaker labour market attachment? To what extent does poor health act as a mediating factor, i.e. those in poor health work less during their career and also withdraw earlier? Is career stability associated with more or less employment in later life? Does the timing of unemployment events matter?

- Early partnership formation and childbearing are associated with earlier withdrawal from the labour market. This result holds for both men and women and so does not appear to be specifically linked to women's life-course experiences (of child rearing, for example). Does this relationship reflect the influences of other life-course factors? Why is having few (or no) children and having many children both associated with less employment in later life?

To investigate these issues we use a sequential modelling approach, in which we progressively add explanatory variables in the approximate order of their corresponding life-course events. For each variable, this allows us to measure the 'total' effect (controlling for previous events) and then (as subsequent variables are added) to see how much of the effect is mediated by later life-course events (and also by potentially concurrent events). In this chapter, we begin with models (explained in more detail below) which explain later-life employment in terms of parental social class. We then add education variables to see the extent to which parental class influences later-life employment via educational achievement and the extent to which education has an independent effect over and above family background influences.

Following this basic analysis of the impact of childhood events, in Chapter 6 we add life-course variables corresponding to early adulthood: the timing of labour market entry and family formation (partnership and childbirth), as well as the number of children in the family. We also investigate whether it is possible to separate the effects of these potentially concurrent events.

Controlling for parental social class, education, labour market entry and family formation, we then analyse the associations of labour market history until age 50 (years in employment, main occupation and industry, etc) with employment in later life. In Chapter 7 we turn to events occurring closer to retirement. We first focus on the influence of job strains, investigating both the extent to which they mediate effects of family and employment history and whether they still have an independent effect after controlling for employment history.

We then look at the influence of other immediate predictors on employment status to see whether they mediate earlier life-course influence. These variables include those summarised above (health, pensions entitlement and savings and marital status); we also assess whether couples coordinate withdrawal from the labour market by looking at the associations between own employment status and partner's employment status. Finally, we see if there is an association between exits from employment and receipt of training and acquisition of new qualifications.

Most analysis is based on the British Household Panel Survey (BHPS) because it contains a much richer set of covariates but we compare the estimates with the LS models wherever possible. This is both to provide a cross-check on the results but also to take advantage of the larger sample sizes of the LS, which allow more detailed effects to be detected.

We estimate two basic model specifications corresponding to the outcome variables discussed above: (1) whether or not a person is employed at the interview date; and (2) whether they have made a transition from employment. Both models are estimated statistically as probit equations, a technique used to explain the probability of a given event happening or not (in our case, being employed or not and exiting or not). As mentioned above, the transition variable in the BHPS analysis measures an exit from employment between one year and the next. In the LS analysis, we measure transitions between 1991 and 2001. All models are estimated separately for men and women and include a standard set of controls in addition to the life-course variables of interest. These controls are: a person's age at interview (allowing for separate slope effects for ages 50-55, 55-60, 60-65 and 65-70); a dummy variable indicating whether a person is above the State Pension age; a set of dummy variables indicating a person's marital status; a year trend to allow for macro-level changes in labour market withdrawal; and the unemployment rate in the local travel to work area.

5.2 Parental social class

Tables 5.1 and 5.2 report the estimates for the basic parental social class models for men and women, using the BHPS. The reported estimates are proportionate marginal effects (changes in probability, evaluated at the mean characteristics of sample members).

In this basic model, it is worth briefly discussing the estimates associated with the standard controls. Age is measured using four age slopes: from 50 to 55, from 55 to 60, from 60 to 65 and from 65 to 70. Each coefficient indicates how much each dependent variable changes over each five year range but using decimals for individual years. For example, the variable age 50–55 has value 0 for those aged 50, 0.2 for those 51, 0.4 for those 52, etc., all up to the value of 1 for those aged 55 or older. The coefficient (-0.087) associated with age 50-55 in the men's employment model means that the probability of employment declines by 0.09 or nine percentage points as age increases from 50 to 55 (1.8 percentage points per year).

State pension age is, on the other hand, a dummy variable with the value 1 for those above this age (60 for women and 65 for men) and 0 for those below. Not surprisingly, reaching State Pension age is strongly associated with withdrawal from employment, although the relationship is somewhat less strong for women. Focusing on the exit models, we see that reaching State Pension age is associated with a 12 percentage point higher probability of leaving employment for men (Table 5.1, column (2)); while a women reaching State Pension age has a 4.3 percentage point higher probability of leaving employment (Table 5.2, column (2)). The previous analysis of age variation in employment (Figures 3.1 and 3.9) indicates that it is necessary to apply such a complicated way of controlling for age since the age variation in labour market attachment/withdrawal is actually complicated.

Table 5.1 Associations of parental social class with employment and exits from employment for men aged 50-70 (BHPS)

	Employed or not (1)	Exits from employment (2)
Age 50-55	-0.087**	0.015
Age 55-60	-0.248**	0.048**
Age 60-65	-0.272**	0.023
Age 65-70	-0.138**	-0.089**
State pension age (d)	-0.170**	0.115**
Widowed (d)	-0.100	0.020
Separated/divorced (d)	-0.172**	0.017
Never married (d)	-0.171**	0.042**
Year trend	-0.009*	0.002
Local unemployment rate	-0.023**	0.004**
Higher salariat	0.098*	-0.002
Lower salariat	0.104*	-0.004
Routine non-manual	0.211**	-0.025**
Petty bourgeoisie	0.171**	-0.019**
Manual foremen and technicians	0.011	0.002
Skilled manual	-0.002	0.010
Number of observations	11,320	6,783

Notes: (d) = dummy variable (1/0); * significant at 5% level; ** significant at 1% level.

Base groups: married/cohabiting; semi- and unskilled manual labour.

Current marital status is measured using the married or cohabiting group as reference (omitted in the tables) whereas being widowed, separated/divorced or never married (and not currently cohabiting) are represented with indicator variables (1 or 0); the coefficients indicate the difference between each of these groups and those currently partnered (married/cohabiting). The results show that partnered men (reference group) are more likely to be employed and less likely to exit employment. Separated/divorced men are similar to never married men (although the relationship to exits is not significant), whereas widowers are no different (statistically) from partnered men. There are comparatively smaller marital status differences among women.

Table 5.2 Associations of parental social class with employment and exits from employment for women aged 50-70 (BHPS)

	Employed or not (1)	Exits from employment (2)
Age 50-55	-0.113**	0.006
Age 55-60	-0.201**	0.063**
Age 60-65	-0.261**	0.011
Age 65-70	-0.224**	0.006
State pension age (d)	-0.059*	0.043*
Widowed (d)	-0.038	-0.008
Separated/divorced (d)	0.031	-0.008
Never married (d)	-0.055	-0.003
Year trend	0.000	0.003*
Local unemployment rate	-0.009	0.003
Higher salariat	0.062	-0.013
Lower salariat	0.133**	-0.012
Routine non-manual	0.015	0.016
Petty bourgeoisie	0.026	-0.011
Manual foremen and technicians	0.056	0.003
Skilled manual	-0.002	0.000
Number of observations	12,421	5,663

Notes: (d) = dummy variable (1/0); * significant at 5% level; ** significant at 1% level.

Base groups: married/cohabiting; semi- and unskilled manual labour.

The year trend coefficient indicates a downward trend in employment over time among men (holding constant the other variables in the model): the employment rate drops by almost a percentage point each year (Table 5.1, column (1)). Finally, local labour market conditions appear to affect both the probability of working and the likelihood of leaving work for men, with little effect among women. For men, a one percent higher unemployment rate is associated with a 2.3 percentage point lower employment probability and 0.4 percentage point higher chance of exiting employment from one year to the next (Table 5.1, columns (1) and (2)).

We now turn to the effects of parental background. Parental social class is measured by father's occupation at age 14 using Goldthorpe's seven-class schema (Goldthorpe 1980; Goldthorpe and Heath 1992). The seven occupational classes are:

I. Higher salariat (managers and administrators in large establishments, higher-grade professionals, large proprietors).

II. Lower salariat (managers and administrators in small establishments, semi-professionals, supervisors of non-manual employees).

III. Routine non-manual labour (sales personnel, routine non-manual employees in administration and commerce).

IV. Petty bourgeoisie (farmers, small employers and self-employed non-professionals).

V. Manual foremen and technicians (lower-grade technicians, supervisors of manual workers).

VI. Skilled manual labour.

VII. Semi- and unskilled manual labour (including farm labourers).

Since these first estimates correspond to the first stage of the sequential modelling approach, they are very similar to the descriptive results summarised in Table 4.3 (the set of control variables is the same but with the addition, to the models, of the year trend and local unemployment). Parental social class has a large effect on men's employment in later life: the sons of fathers in non-manual occupations, and especially those in the 'routine non-manual' and 'petty bourgeois' categories (which includes the self employed), have substantially higher chances of being in employment. By contrast, there is little evidence that parental social class affects women's later-life employment. Although the 'lower salariat' coefficient is significant (Table 5.2, column (1)), the parental social class variables taken as a whole are not significant at the five per cent level.

Of course, parental social class is likely to be strongly correlated with many subsequent events in a person's life, and we are interested in knowing the extent to which the effects of parental class act through these channels. We now begin adding subsequent life-course variables, starting with measures of educational achievement.

5.3 Education

Tables 5.3 and 5.4 report the estimates of the models including education. Educational qualifications are entered as a dummy variable indicating whether or not a person has an O-level (or equivalent) or greater. Statistical testing showed that the effects of the different qualifications within this category did not differ significantly from one another and so they have been combined. Combining variables in this way makes more efficient use of the data given the available sample size.

The specification also includes an interaction of the education variable with another dummy variable indicating that a man is aged 60 or more, or that a woman is aged 55 or more. These interactions are included because analysis of the education effects showed that they were partly reversed for older people. Specifically, the interaction coefficient shows any difference in the impact of education among people aged over 59 (men) or 54 (women) compared to their relatively younger counterparts. A coefficient of zero would indicate that education has the same effect among individuals in both age groups. In fact, we see that the interaction coefficients are negative, and this is especially so for women. For workers in the older groups, the education effect is given by the main coefficient **plus** the

interaction coefficient. Since the interaction coefficients are negative, this implies that the education effect is **smaller** among workers in the older age groups.

The table shows that women with O-levels or greater and aged 50-54 years are 22 percentage points more likely to be employed than those with less than O-level qualifications (including no qualifications). For women over 54 years, the education effect is given by the main coefficient (0.220) plus the interaction coefficient (–0.086) (Table 5.4, column(1)). This implies that the education effect is only 22 – 9 = 13 percentage points. For men under 60, the main effect of education is 13 percentage points, reducing to 13 – 5 = 8 percentage points for men aged 60 or over (Table 5.3, column(1)). For men, the reversal is less pronounced and in fact the interaction term, while negative, does not reach statistical significance. Notice that the reversal is only partial, so it is not true that older, more educated people are less likely to be working than those with no qualifications.

Turning to the parental social class effects, we see that they have been reduced by the addition of the education variables (Table 5.3, column(1)). This particularly applies to the higher and lower salariat categories for men (comprising managers, administrators and professionals): their effect on employment probability is now only 60-70 per cent of the former values (and no longer significant). This implies that the effects on later-life employment of being raised in the 'top' two social classes are largely transmitted through higher levels of education. By contrast, the effects of the routine non-manual category (non-manual workers in sales, administration and commerce, etc.) and the petty bourgeois category, largely remain. It is difficult to say exactly what lies behind this result (which persists in the more complicated later models) but one possibility – especially for the petty bourgeois class which includes small business owners and the self-employed – is that there is a work ethic among these classes which is transmitted to children irrespective of what they learn formally. Again, we find no parental background effects for women and parental social class is omitted from subsequent specifications of the women's models.

Table 5.3 Associations of education and parental social class with employment and exits from employment for men aged 50-70 (BHPS)

	Employed or not (1)	Exits from employment (2)
Age 50-55	-0.086**	0.016
Age 55-60	-0.221**	0.044**
Age 60-65	-0.247**	0.021
Age 65-70	-0.131**	-0.088**
State pension age (d)	-0.179**	0.117**
Widowed (d)	-0.087	0.020
Separated/divorced (d)	-0.166**	0.016
Never married (d)	-0.154**	0.041**
Year trend	-0.010**	0.002
Local unemployment rate	-0.022**	0.004**
Higher salariat	0.057	-0.002
Lower salariat	0.071	-0.004
Routine non-manual	0.179**	-0.025**
Petty bourgeoisie	0.157**	-0.019**
Manual foremen and technicians	-0.010	0.002
Skilled manual	-0.011	0.010
O-level or more (d)	0.129**	-0.004
O-level or more* over 59 years (d)	-0.049	0.006
Number of observations	11,320	6,783

Notes: (d) = dummy variable (1/0); * significant at 5% level; ** significant at 1% level.

Base groups: married/cohabiting; semi- and unskilled manual labour; less than O-level or no qualifications.

We might also wonder whether the effects of education would be larger if parental social class were omitted. Tables B.1 and B.2 show that the education effects are almost the same in models without parental social class, so education seems to have an independent effect on later-life employment. Men raised in the 'top' two social classes receive more education than others and this seems to the main driver of their later-life employment.[8]

[8] Finally, it is also worth noting that omitting local unemployment increases the main education effect on employment rates for men by one percentage point (results not reported). This is presumably because lower educated workers live disproportionately in more depressed areas.

Table 5.4 Associations of education and parental social class with employment and exits from employment for women aged 50-70 (BHPS)

	Employed or not (1)	Exits from employment (2)
Age 50-55	-0.063*	0.002
Age 55-60	-0.170**	0.059**
Age 60-65	-0.255**	0.011
Age 65-70	-0.220**	0.005
State pension age (d)	-0.072**	0.045*
Widowed (d)	-0.031	-0.009
Separated/divorced (d)	0.036	-0.008
Never married (d)	-0.059	-0.002
Year trend	-0.002	0.003**
Local unemployment rate	-0.007	0.003
Higher salariat	-0.012	-0.008
Lower salariat	0.080	-0.009
Routine non-manual	-0.031	0.021
Petty bourgeoisie	0.001	-0.009
Manual foremen and technicians	0.037	0.004
Skilled manual	-0.010	0.001
O-level or more (d)	0.220**	-0.020
O-level or more* over 54 years (d)	-0.086**	0.008
Number of observations	12,421	5,663

Notes: (d) = dummy variable (1/0); * significant at 5% level; ** significant at 1% level.

Base groups: married/cohabiting; semi- and unskilled manual labour; less than O-level or no qualifications.

For comparison with the BHPS estimates of education effects, Tables 5.5 and 5.6 report models estimated using the LS. The LS does not contain parental social class for the cohort studied here, so the most comparable BHPS models are Tables B.1 and B.2 (though as already noted, the education coefficients are very close to the results reported above). The LS data structure is different to the BHPS, but the dependent variables are defined similarly: (1) employed or not in 2001; and (2) transitions from employment in 1991 to non-employment in 2001. The much larger sample sizes in the LS allow separate coefficients to be estimated for the different qualification levels as well as their interactions with age. We therefore include dummy variables for a highest qualification of degree level, A-level, O-level and less than O-level (or their approximate equivalents); as well as interactions of these variables with a dummy for age 60 or over (men) or 55 or over (women).

For men, the main effects of the different qualifications are similar to each other, as was expected from the BHPS analysis and overall their magnitudes are close to the BHPS estimate (about 13 percentage points). We also see the partial reversal of the effect for men of 60 or over (Table 5.5, column (1)). For women, higher

qualifications have somewhat larger effects than lower qualifications, although the overall magnitudes are again reasonably close to the BHPS results. Again, we see an interaction effect for women over 54 (of about six percentage points, Table 5.6, column (1)).[9]

The LS analysis also reveals that educational qualifications are strongly associated with fewer transitions out of employment for older workers: the probability of exiting is reduced by about seven percentage points among men aged 50-59 (Table 5.5, column (2), main education coefficients) and by about 14 percentage points for women aged 50-54 (Table 5.6, column (2), main education coefficients). These effects are much stronger than in the BHPS analysis (where the estimates were positive but not significant), however, the LS analysis looks at transitions over a ten-year period, rather than year-on-year transitions as in the BHPS.

Table 5.5 Associations of education with employment in 2001 and exits from employment 1991-2001 for men aged 50-70 in 2001 (LS)

	Employed or not 2001 (1)	Exits from employment 1991-2001 (2)
Age 50-55	-0.120**	0.136**
Age 55-60	-0.186**	0.187**
Age 60-65	-0.252**	0.246**
Age 65-70	-0.162**	0.136**
State pension age (d)	-0.205**	0.203**
Separated/divorced (d)	-0.137**	0.078**
Widowed (d)	-0.144**	0.113**
Never married (d)	-0.230**	0.143**
Degree (d)	0.142**	-0.073**
A-level (d)	0.110**	-0.057**
O-level (d)	0.129**	-0.078**
Less than O-level (d)	0.104**	-0.051**
Degree* over 59 years (d)	-0.077**	0.044**
A-level* over 59 years (d)	-0.059*	0.009
O-level* over 59 years (d)	-0.049**	0.022*
Less than O-level* over 59 years (d)	-0.007	-0.016
Number of observations	48,594	40,990

Notes (d) = dummy variable (1/0); * significant at 5% level; ** significant at 1% level.

Base groups: married/cohabiting; no qualifications.

Source: ONS LS. Authors' analysis.

[9] The differences with respect to the BHPS perhaps stem from differences in the way the qualification categories are combined. Compared to the BHPS, the education variable in the LS contains a larger proportion of individuals with no qualifications, more defined as having less than O-level or having O-level (or equivalent) and fewer with A-level or equivalent.

Table 5.6 Associations of education with employment in 2001 and exits from employment 1991-2001 for women aged 50-70 in 2001 (LS)

	Employed or not 2001 (1)	Exits from employment 1991-2001 (2)
Age 50-55	-0.058**	0.084**
Age 55-60	-0.160**	0.191**
Age 60-65	-0.278**	0.287**
Age 65-70	-0.257**	0.234**
State pension age (d)	-0.098**	0.127**
Separated/divorced (d)	0.006	-0.042**
Widowed (d)	-0.036**	0.011
Never married (d)	-0.095**	0.080**
Degree (d)	0.260**	-0.172**
A-level (d)	0.225**	-0.167**
O-level (d)	0.173**	-0.118**
Less than O-level (d)	0.171**	-0.124**
Degree* over 54 years (d)	-0.141**	0.130**
A-level* over 54 years (d)	-0.056*	0.044
O-level* over 54 years (d)	-0.067**	0.053**
Less than O-level* over 54 years (d)	-0.053**	0.046**
Number of observations	51,924	33,972

Notes: (d) = dummy variable (1/0); * significant at 5% level; ** significant at 1% level.

Base groups: married/cohabiting; no qualifications.

Source: ONS LS. Authors' analysis.

5.4 Childhood events and later-life employment – summary

Our initial analysis reveals little association between a person's parental background and their own later-life employment. We only find effects among men and then only when considering the Goldthorpe seven-category definition of social class (rather than broader background measures like father's employment status or belonging to a lone-parent family). Men brought up in the 'higher' classes have higher employment rates. Among men whose parents were 'professionals' (a group also including managers and administrators, large proprietors and supervisors of non-manual employees) this can be explained by these men's higher educational attainments. Among men whose fathers were in the routine non-manual class (typically working in sales, administration and commerce) and the petty bourgeoisie (including the self-employed), the effect persists after controlling for educational achievement – and also, it turns out, for subsequent factors like occupation and later life health (we do not focus on these results in

the report). A possible explanation is that boys from the routine non-manual class and petty bourgeoisie acquired a work ethic (independently of formal schooling) which favours continuing employment in later life.

Unsurprisingly, more education is associated with higher employment rates and fewer transitions out of employment. The important distinction is between having no qualifications and having qualifications of O-level or greater (within this group, all qualifications have similar effects). There is some evidence that the education gap shrinks among older people (especially women) as the better qualified withdraw from employment (probably because of better pension entitlements).

6 Adulthood events and later-life employment: multivariate modelling

This chapter covers events typically occurring in early adulthood – entry to the labour market and family formation – together with events forming part of the subsequent career and family trajectories until age 50.

6.1 Labour market entry and family formation

We first focus on the effects of early events in the labour market and in family life. In particular, we look at the ages at which a person began their first job (lasting more than six months), formed their first partnership and had their children. We also look at the effect of different numbers of children. We estimate separate models for each of the timing variables since we wish, initially, to assess their total effects. It also turns out that because some of events are so often closely spaced (e.g. partnership formation and childbirth) it is difficult to separate their effects.

6.1.1 Age of entering employment

Age of entering employment is included in the models as two different slopes centred on 30 years (chosen after statistical testing for the best fitting relationship). Only a small proportion of the sample entered employment for the first time after 30, but they have lower employment rates in later life (possibly because of lower labour market attachment in general) and this is allowed for by the second slope. The slopes work in a similar way to the slopes for current age discussed earlier. The age>30 slope equals 0 for those starting work at 30, 0.2 for those starting at 31, 0.4 for those starting at 32, etc. The age<30 slope is the mirror image of the first slope (so it equals 0 at 30, –0.2 at 29, etc.). The estimated coefficients show the effect of a five-year delay in starting work (corresponding to an increase in the slope of one unit). To save space, in this and most subsequent tables, we do not report the coefficients associated with age, marital status, the year trend, local unemployment or parental social class.

Table 6.1 Associations of age of labour market entry with employment and exits from employment for men aged 50-70 (BHPS)

	Employed or not (1)	Exits from employment (2)
O-level or more (d)	0.091**	-0.000
O-level or more* over 59 years (d)	-0.036	0.002
Age entered employment		
Age <30	0.053*	-0.008
Age >30	-0.060	0.017
Number of observations	10,137	6,051

Notes: (d) = dummy variable (1/0); * significant at 5% level; ** significant at 1% level.

Base groups: less than O-level or no qualifications.

Controls also included: parental social class, age, marital status, local unemployment rate and time trend.

In Chapter 4 we noted that later entry to employment was associated with higher employment rates in later life but suggested that education should also be accounted for when studying this relationship. Controlling for education (in Tables 6.1 and 6.2), individuals entering the labour market later (up to 30) are still more likely to be employed in later life (and are less likely to exit), although these effects are smaller than when education is omitted (former estimates not reported). For women, there is a substantial negative effect of delaying labour marker entry after 30 (Table 6.2, column (1)). This probably reflects the fact that this small group of women (just under two per cent of the sample) are much less likely to work at all.

Although the coefficients associated with age of entering employment are not precisely estimated, the education effects previously noted do seem to be partly mediated by age of labour market entry. Compared to Tables 5.3 and 5.4, column (1), the women's education coefficients decline slightly (e.g. from 0.22 to 0.20 in Table 6.2, column (1)), while the men's education coefficients declines substantially (e.g. 0.13 to 0.09 in Table 6.1, column (1)). This is consistent with individuals delaying labour market entry to obtain more qualifications.

Table 6.2 Associations of age of labour market entry with employment and exits from employment for women aged 50-70 (BHPS)

	Employed or not (1)	Exits from employment (2)
O-level or more (d)	0.197**	-0.023
O-level or more* over 54 years (d)	-0.083**	0.013
Age entered employment		
Age <30	0.049	-0.014
Age >30	-0.125*	0.041*
Number of observations	12,887	5,905

Notes: (d) = dummy variable (1/0); * significant at 5% level; ** significant at 1% level.

Base groups: less than O-level or no qualifications.

Controls also included: age, marital status, local unemployment rate and time trend.

6.1.2 Age at first partnership

The exploratory analysis summarised in Chapter 4 found that later partnership formation (up to age 25) was positively associated with employment in later life for both men and women. It was not clear, though, whether this was linked to greater education attainments among those partnering later on, or perhaps because of subsequent patterns of childbearing. Tables 6.3 and 6.4 report estimates of the first partnership effects controlling for education (we investigate the effects of children below). As for age of labour market entry, we use different slopes for entering a first partnership for ages below and above 25 years (coefficients indicating a five-year increase using decimals for individual years).[10] At this stage, we do not include age of labour market entry, since we wish to measure the 'total' effect of age at first partnership.

The results show that the probability of being employed (after 50) is higher the later people entered a first partnership up to the age of 25. Also, exits from employment (after 50) decrease with increased age of partnership formation up to 25 but again not with later partnership formation. The partnership effects do not, therefore, seem to (fully) reflect different education levels, although the education coefficients are reduced compared to Tables 5.3 and 5.4 – so education effects are partly mediated by age of first partnership. It is striking that the partnership effects are similar for men and women, perhaps contrary to expectations. We investigate overleaf if this result holds when controlling for later family and labour market history.

[10] The 25-year cut point was chosen because it is close to the average year when entering a first partnership (24 years) and when having a first child (26 years). The larger sample available from the Office for National Statistics Longitudinal Study (ONS LS) indicates that this is an appropriate way of describing the data as regards age of having a first child (Figure 4.3).

Table 6.3 Associations of age at first partnership with employment and exits from employment for men aged 50-70 (BHPS)

	Employed or not (1)	Exits from employment (2)
O-level or more (d)	0.108**	-0.002
O-level or more* over 59 years (d)	-0.042	0.004
First partnership		
Age <25	0.088*	-0.017*
Age >25	-0.009	0.003
Number of observations	10,698	6,449

Notes: (d) = dummy variable (1/0); * significant at 5% level; ** significant at 1% level.

Base groups: less than O-level or no qualifications.

Controls also included: parental social class, age, marital status, local unemployment rate and time trend.

Table 6.4 Associations of age at first partnership with employment and exits from employment for women aged 50-70 (BHPS)

	Employed or not (1)	Exits from employment (2)
O-level or more (d)	0.207**	-0.023*
O-level or more* over 54 years (d)	-0.080**	0.011
First partnership		
Age <25	0.065*	-0.017*
Age >25	-0.026	0.002
Number of observations	13,931	6,316

Notes: (d) = dummy variable (1/0); * significant at 5% level; ** significant at 1% level.

Base groups: less than O-level or no qualifications.

Controls also included: age, marital status, local unemployment rate and time trend.

6.1.3 Age at birth of first child

How do children affect the employment of their parents in later life? A standard hypothesis is that they could delay labour market withdrawal and perhaps for mothers in particular (e.g. Pienta, Burr and Mutchler 1994; Pienta 1999). German data have supported this hypothesis (Hank 2004). We also know that children reduce female employment but have fewer effects on male employment at least when the children are small (e.g. Berthoud and Blekesaune 2007). But we do not know how the timing of child birth affects employment of parents later on. It is possible that some women would like to catch up by doing more work in later life, perhaps because of reduced pension savings. Similarly, having dependent children could delay exit from the labour market among older workers because of the economic responsibilities that follow. It is also possible that health problems may

deter some people from having children altogether. All these effects imply that mothers or parents more generally could have relatively high employment rates when aged 50-70. But these effects could be counteracted by the fact that many mothers are not able to develop their job-specific skills while caring for children.

We begin by examining the effects of the timing of the first birth. Relatively large numbers of early life motherhood in Britain and in North America has led to much debate over possible effects of teenage childbirth/motherhood for children as well their parents (e.g. Goodman, Kaplan and Walker 2004). There are some statistical correlations between teenage motherhood as well as early sexual relationships and risks of poor outcomes in later life (Ermisch 2003; Armour and Haynie 2007).

Tables 6.5 and 6.6 show that having children later is also associated with higher employment rates in later life, controlling for education (the effects are actually stronger for men than women, although this difference is not statistically significant). These results are consistent with the idea that children impose economic responsibilities and reduce pension saving and so people who have children later need to delay their labour market withdrawal. Overall, it does not seem that having children later is associated with a decline in job-related resources that prevents people from working – especially as we find a stronger effect for men, whose careers are less affected by having children. The models omit age at first partnership, so the coefficients measure the total effect of early parenthood. If age at first partnership is included in the equations, both sets of coefficients are statistically insignificant. This is no doubt because the two events are often almost concurrent (or at least highly correlated) and therefore, it is difficult to separate them in the analysis. In our main models below, we use age of first partnership as a measure of family formation.

Table 6.5 Associations of age at first childbirth with employment and exits from employment for men aged 50-70 (BHPS)

	Employed or not (1)	Exits from employment (2)
O-level or more (d)	0.121**	-0.003
O-level or more* over 59 years (d)	-0.042	0.005
Age had first child		
Age <25	0.121*	-0.014
Age >25	0.017	0.002
No children (d)	-0.029	0.006
Number of observations	11,247	6,748

Notes: (d) = dummy variable (1/0); * significant at 5% level; ** significant at 1% level.

Base groups: less than O-level or no qualifications.

Controls also included: parental social class, age, marital status, local unemployment rate and time trend.

Table 6.6 Associations of age at first childbirth with employment and exits from employment for women aged 50-70 (BHPS)

	Employed or not (1)	Exits from employment (2)
O-level or more (d)	0.209**	-0.022*
O-level or more* over 54 years (d)	-0.080**	0.010
Age had first child		
Age <25	0.064*	-0.008
Age >25	-0.014	-0.010
No children (d)	-0.056	-0.006
Number of observations	14,520	6,528

Notes: (d) = dummy variable (1/0); * significant at 5% level; ** significant at 1% level.

Base groups: less than O-level or no qualifications.

Controls also included: age, marital status, local unemployment rate and time trend.

6.1.4 Number of children

If starting a family later is associated with later labour market withdrawal, we might expect that having more children would reinforce these effects. We next add the number of children to the models. Based on the LS analysis to be discussed later, the number of children enters as two dummy variables, one indicating having no children and the other indicating a large family (more than three children). Tables 6.7 and 6.8 show that while having no children is associated with lower employment rates in later life, so is having more than three children (compared to the base category of 1-3 children). These coefficients are not significant but they are consistent with the patterns in the LS, as will be seen. The curvilinear relationship in children that was seen in the exploratory analysis persists after controlling for education and the age of becoming a parent.

Table 6.7 Associations of age at first childbirth with employment and exits from employment for men aged 50-70 (BHPS

	Employed or not (1)	Exits from employment (2)
O-level or more (d)	0.118**	-0.003
O-level or more* over 59 years (d)	-0.042	0.005
Age had first child		
Age <25	0.101*	-0.014
Age >25	0.015	0.002
No children (d)	-0.037	0.006
More than three children (d)	-0.079	-0.001
Number of observations	11,247	6,748

Notes: (d) = dummy variable (1/0); * significant at 5% level; ** significant at 1% level.

Base groups: less than O-level or no qualifications; 1-3 children.

Controls also included: parental social class, age, marital status, local unemployment rate and time trend.

Table 6.8 Associations of age at first childbirth with employment and exits from employment for women aged 50-70 (BHPS)

	Employed or not (1)	Exits from employment (2)
O-level or more (d)	0.209**	-0.022*
O-level or more* over 54 years (d)	-0.080**	0.010
Age had first child		
Age <25	0.051	-0.006
Age >25	-0.015	-0.010
No children (d)	-0.060	-0.006
More than three children (d)	-0.065	0.010
Number of observations	14,520	6,528

Notes: (d) = dummy variable (1/0); * significant at 5% level; ** significant at 1% level.

Base groups: less than O-level or no qualifications; 1-3 children.

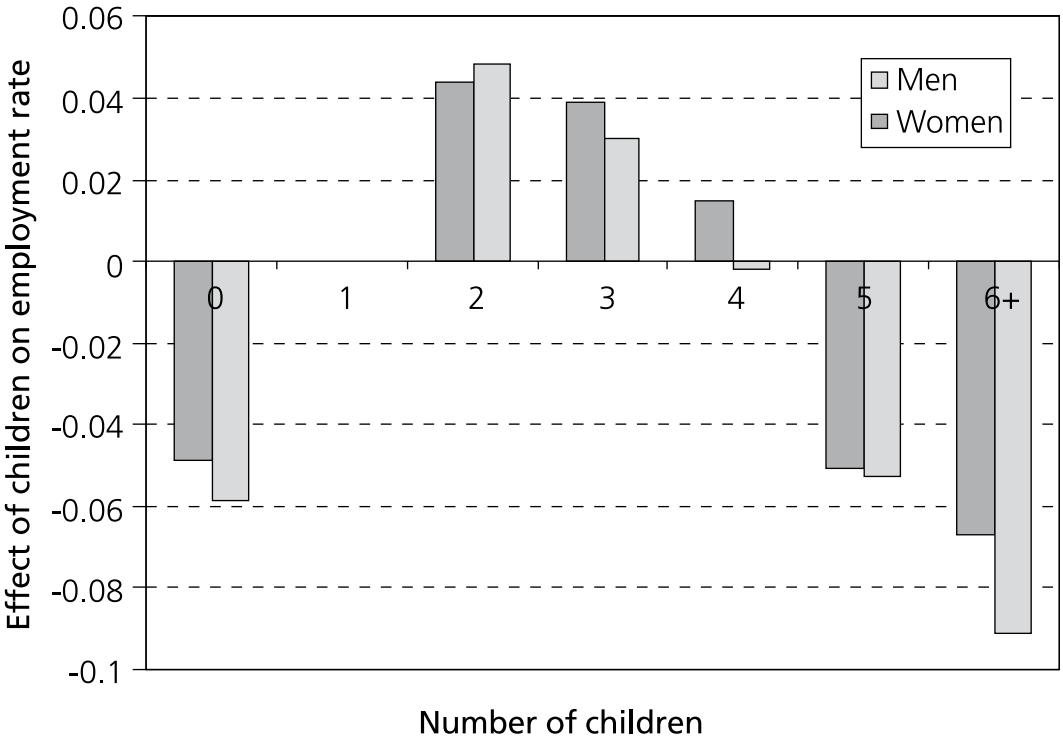
Controls also included: age, marital status, local unemployment rate and time trend.

For comparison with these BHPS models, we turn to the much large sample sizes of the LS which allow the effects of different numbers of children to be estimated in more detail. The number of children is measured as the largest number (of the LS member or their partner) observed in any of the four Censuses 1971-2001.[11] Figure 6.1 shows the effects for different numbers of children, with one child as the default category (full results are in Tables C.1 and C.2). For both men and women, having no children is associated with lower employment rates in later life (by about five percentage points compared to having one child). Having two or three children is associated with higher employment levels but for larger families the effects are smaller and even negative (compared to having a single child). Individuals who have had five or more children are no more (or even less) likely to be employed than those with no children.

The rising part of the curvilinear shape is consistent with the idea that children represent an economic cost (and so restrict saving for later life). It could also reflect a health effect if people with health problems have fewer children and tend to work less in later life. However, both these suggestions seem to be contradicted by the declining effect for very large families. In a related study, Berthoud and Iacovou (2006) documented lower employment rates among parents with more dependent children. One reason they suggest for this is that the extra housework and childcare requirements faced by very large families prevail over the need for more money to support the family. These considerations presumably do not apply to the older parents of grown-up children who are being analysed here. Instead, these parents may have more home-centred preferences or (especially for women) have missed out on experience and training. We pursue these questions below when we add controls for employment history.

[11] One reason is that we do not know if the children observed in two Censuses are actually the same or different children.

Figure 6.1 Association of highest number of children observed in 1971-2001 Censuses and later-life employment rate (LS)



Notes: Other controls are age, marital status, age had first child and education.
Source: ONS LS. Authors' analysis.

6.1.5 Age at birth of last child

It is possible that having children over an extended period has an effect on subsequent labour market participation. This could be the case for women in particular if it interrupts their employment experience and acquisition of labour market skills. We estimated models which include a person's age when they had their last child (both with and without age at first partnership and age at birth of first child) but found that having the last child at a later age is not associated with systematically different labour market outcomes after age 50 (result not reported).

6.1.6 Number of partners and age at partnership dissolution

We have found that a person's age of partnership formation is associated with their later-life employment. What is the effect of a subsequent dissolution (here we include divorce, separation and the end of cohabitation)? We investigate this in two ways, as reported in Tables B.16 to B.19: we first look at the number of partners a person has had; then we look at the timing (age) of the last observed partnership dissolution. As can be seen from the Appendix B tables, there is no evidence that either measure is associated with later-life employment outcomes, by contrast with the relatively strong effects due to the timing of initial partnership formation.

6.2 Employment history

The next step in the analysis is to add variables measuring labour market history. The early life variables which we retain in the models are parental class (for men), education, age of labour market entry, age at first partnership and dummy variables for the number of children. To explore the different aspects of individuals' labour market experiences which might affect later-life employment outcomes, we use three alternative measures of employment history: years of employment and unemployment, a person's occupation in their longest job before age 50 and the industry of a person's longest job before 50.

6.2.1 Years of employment and unemployment

It seems intuitive that those with the most stable employment history up to the age of 50 are also more likely to be employed in their 50s and 60s than those with less work experience. Such correlations could reflect any factor affecting employability including health, education and job skills (e.g. Flippen and Tienda 2000; Disney *et al.* 2006). On the other hand, if people have been working for a large number of years, they could have a preference for leisure and retirement when approaching their 60s; conversely, if they have worked for only a few years they could have a preference for working longer before exiting employment altogether. Such correlations can be derived from the work-leisure model which says that most people prefer some balance between time spent in work and leisure or perhaps rather the money they can get from work and the time for enjoying their money during leisure or retirement.

Regarding unemployment it seems reasonable to assume that people experiencing unemployment before 50 are less likely to be employed after 50 because unemployment is likely to reflect a lack of skills relevant for finding or holding on to a job (Flippen and Tienda 2000). Chapter 3 showed, however, that people becoming unemployed are actually quite likely to move back to employment. It could be that the unemployed are in an intermediate position regarding employment prospects: they could have fewer job related resources than those currently employed but they could be in a strong position when compared to some social groups who are economically inactive.

Table 6.9 Associations of years of employment/unemployment before 50 with employment and exits from employment for men aged 50-70 (BHPS)

	Employed or not (1)	Exits from employment (2)
O-level or more (d)	0.056	0.000
O-level or more* over 59 years (d)	-0.008	0.001
First partnership		
Age <25	0.090*	-0.016*
Age >25	0.018	-0.006
No children (d)	-0.068	0.019*
More than three children (d)	-0.074	-0.001
Age entered employment		
Age <30	0.230**	-0.008
Age >30	0.143	0.013
Years employed (per five years)	0.198**	-0.002
Years unemployed	-0.025*	0.004
Number of observations	10,030	5,999

Notes: (d) = dummy variable (1/0); * significant at 5% level; ** significant at 1% level.

Base groups: less than O-level or no qualifications; 1-3 children.

Controls also included: parental social class, age, marital status, local unemployment rate and time trend.

Tables 6.9 and 6.10 support the idea that a history of stable employment reflects a high underlying level of employability and that this leads to later labour market withdrawal. The effects are especially large for men: an additional five years in employment before 50 is associated with a 20 percentage point larger probability of being in employment after 50 (Table 6.9, column (1)). This is about twice the effect for women (Table 6.10, column (1)), although there is more evidence for women that years in employment reduces year-on-year transitions out of employment (by one percentage point for five more years of employment, column (2)). Past unemployment reduces men's employment probabilities (by three percentage points for every year of unemployment; Table 6.9, column (1)) but seems to have no effect on women's prospects (Table 6.10, column (1)). As noted above, it is likely that women reporting unemployment tend to have more job-related resources than those reporting that they are inactive. Thus, the measured unemployment effect will be a combination of the negative effect of unemployment and the positive 'selection' effect of unemployment compared to inactivity. For men, the inactive category is very small and so the true unemployment effect dominates.

As well as showing that employment history is an important predictor of later employment levels, the results provide evidence that several of the early life effects are mediated by years of employment. The main effect of education on men's employment probabilities is now only 5.6 percentage points and not statistically significant (Table 6.9, column (1)), compared to nine percentage points when

we control for age of labour market entry but not years of employment (Table 6.1, column (1)). For women, the main education effect drops slightly, from 20 percentage points (Table 6.2, column (1)) to 18 percentage points (Table 6.10, column (1)). The results suggest that, especially for men, education increases employment stability and employment stability then contributes to later labour market withdrawal.

Table 6.10 Associations of years of employment/unemployment before 50 with employment and exits from employment for women aged 50-70 (BHPS)

	Employed or not (1)	Exits from employment (2)
O-level or more (d)	0.176**	-0.021
O-level or more* over 54 years (d)	-0.082**	0.013
First partnership		
Age <25	0.076*	-0.016*
Age >25	-0.048	0.003
No children (d)	-0.167**	0.017
More than three children (d)	0.010	0.002
Age entered employment		
Age <30	0.104**	-0.016
Age >30	-0.073	0.031
Years employed (per five years)	0.090**	-0.009**
Years unemployed	-0.001	0.001
Number of observations	12,818	5,895

Notes: (d) = dummy variable (1/0); * significant at 5% level; ** significant at 1% level.

Base groups: less than O-level or no qualifications; 1-3 children.

Controls also included: age, marital status, local unemployment rate and time trend.

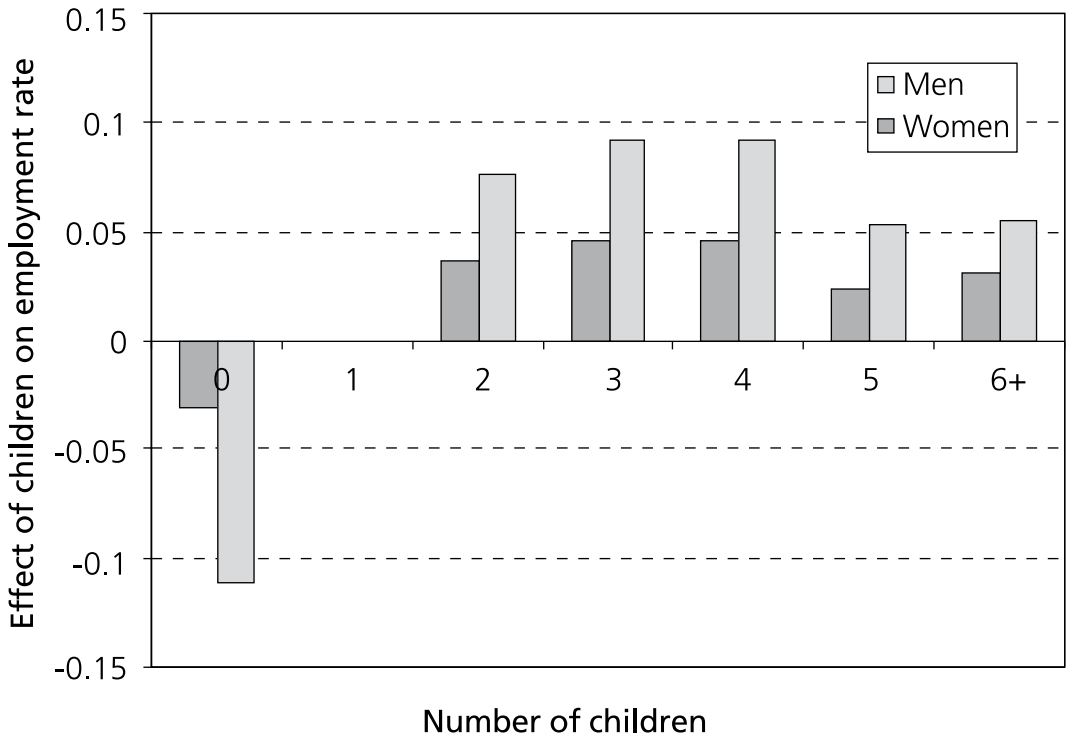
Now that employment history is in the models, we also see that the effects of the age of labour market entry are much larger and more precisely estimated. Men who delay labour market entry by five years are 23 percentage points more likely to be employed after 50 (Table 6.9, column (1), compared to five percentage points in Table 6.1, column (1)), while women are nine percentage points more likely to be employed (Table 6.10, column (1), compared to an insignificant estimate of five percentage points in Table 6.2, column (1)). Why are these new estimates larger? Late entry to employment may partly be an indicator of weak labour market attachment (those who work relatively little often started late). Once we control for this by including years of employment, the 'direct' effect of later labour market entry is seen to be larger. A likely mechanism is that, all else constant, a person who becomes established in the labour market at a later age will need to work for longer to build up sufficient pension entitlements. This effect parallels the effect seen earlier of having children at later ages.

Holding constant years of employment (and unemployment) we also see that employment rates are much lower (by 17 percentage points) among women who never had children (Table 6.10, column (1)). This is much larger than the previous estimate (–6 percentage points in Table 6.8, column (1)), probably because of the confounding factor that childless women also tend to work more. Furthermore, there is now also no sign of a negative effect of large families on women's employment. We know that large families work less during their earlier lives (Berthoud and Iacovou, 2006). The results here imply that this lower labour market experience then leads to earlier withdrawal from employment after 50. After allowing for their lower previous experience, it does not seem that parents of large families have a particular preference for earlier retirement, although more home-centred preferences could explain their weaker labour market attachment earlier in life. We experimented with including variables for a person's age at first and last childbirth but there is no evidence that the timing of childbirth has any effect after controlling for employment history.

Estimates using the LS, shown in Figure 6.2 (and reported in detail in Tables C.3 and C.4), confirm our conclusions about family size effects. It is not possible to measure employment history as accurately as in the BHPS because individuals are only observed at the discrete Census points, and there is no retrospective information as in the BHPS. Measures of employment, unemployment and permanent sickness/disability are constructed as the number of times (0-3) each of these experiences was recorded in the Censuses of 1971, 1981 and 1991. We find that previous employment is positively associated with employment in later life and that unemployment is negatively associated with men's later employment. For women, previous unemployment has a positive association with later-life employment; again, this probably reflects the selection effect discussed above.

The LS results also confirm that the large family effect disappears when employment history is included. There is now a moderately positive association (relative to parents with just one child) between having a large family and being in employment in later life. Having no children is still associated with lower employment probabilities, and (as in the BHPS) this effect is particularly large for women after controlling for employment history.

Figure 6.2 Association of highest number of children observed in 1971-2001 Censuses and employment rate in 2001 (LS)



Notes: Other controls are age, marital status, age had first child, education and number of times observed to be employed, unemployed and permanently sick in 1971-91 Censuses.
Source: ONS LS. Authors' analysis.

6.2.2 Number of employers and timing of unemployment spells

It is possible that career stability (as opposed to employment stability) matters for later-life employment prospects. Individuals with more stable careers may be more likely to have the skills and resources to stay in employment in later life; on the other hand, people who have held the same job over much of their careers have probably built up more occupational pension entitlements and so may retire earlier. Tables B.3 and B.4 provide some evidence for this latter hypothesis. People who had more employers before 50 are more likely to be in employment subsequently and are less likely to leave employment. A caveat to this finding is that the measure of the number of employers may be affected by recall error: when asked to think back many years, survey respondents tend to report fewer changes of employers than when they are followed year on year through the panel.

We have found that past unemployment affects men's later-life employment levels. A natural question is whether this scarring effect depends on how recently the unemployment occurred. Tables B.5 and B.6 show that for men, the effects diminish over time: while a year of unemployment before 50 is associated with a three percentage point lower probability of later-life employment, this effect is reduced by 0.4 percentage points for every year since the unemployment spell.

6.2.3 Main occupation

An alternative way to represent employment history is to use a person's occupation in the longest job held before 50. Labour market withdrawal is likely to vary between occupations for several reasons: First, company pension provision may vary systematically across occupations. Second, with rapid technological change there could be shifts in demand among the different occupations. Finally, some occupations may involve strenuous tasks that are difficult for older workers to accomplish. Our estimates in this section do not include job strains separately; we analyse them specifically below. Occupations are classified according to the 1990 Standard Occupational Classification (SOC) system; we use the nine major occupational groups.

In Table 6.11 we see that, compared to the base occupation of skilled trades, men who were professionals, associate professionals or in clerical occupations have lower employment rates after age 50. The associate professional coefficient is not statistically significant, although the analysis of hours worked (not reported) suggests that these jobs may be associated with shorter hours in later life. The labour demand and job strain hypotheses do not seem to fit the finding that non-manual occupations (excluding managers) have lower employment probabilities, since physical job strains should be lower in non-manual jobs and the demand for skills is probably higher. The most likely explanation, therefore, is that pension coverage and entitlements are better among non-manual occupations.

Perhaps surprisingly, the education coefficient of 0.089 in Table 6.11, column (1) is now larger than when we controlled for years in employment (0.056 in Table 6.9, column (1)); this implies that education seems to affect later-life employment more by its contribution to 'employability' than by its influence on occupational choice.

Table 6.11 Associations of main occupation before 50 with employment and exits from employment for men aged 50-70 (BHPS)

	Employed or not (1)	Exits from employment (2)
O-level or more (d)	0.089*	-0.002
O-level or more* over 59 years (d)	-0.030	0.001
First partnership		
Age <25	0.088*	-0.018*
Age >25	0.004	-0.008
No children (d)	-0.028	0.017
More than three children (d)	-0.097*	0.002
Age entered employment		
Age <30	0.076*	-0.011
Age >30	-0.081	0.019
Manager (d)	0.015	0.005
Professional (d)	-0.164**	0.033
Associated professional (d)	-0.077	-0.003
Clerical (d)	-0.149**	0.019
Personal services (d)	-0.044	0.012
Sales (d)	0.078	-0.022**
Operatives (d)	-0.032	0.000
Routine (d)	-0.005	0.003
Number of observations	9,256	5,527

Notes: (d) = dummy variable (1/0); * significant at 5% level; ** significant at 1% level.

Base groups: less than O-level or no qualifications; 1-3 children; skilled trade/craft occupation.

Controls also included: parental social class, age, marital status, local unemployment rate and time trend.

For women we find different results, as seen in Table 6.12. Statistical testing showed that, as for education, there is a partial reversal of some of the occupation effects after age 55 (we found no evidence of this for men). Among women aged 50-54, being in the 'lower' occupational groups (in particular the sales and operative categories) is associated with substantially lower employment rates (by around 15 percentage points; Table 6.12, column (1)). The interaction terms show that this association is essentially cancelled out for women over 55. To illustrate this more clearly, Figure 6.3 shows predicted employment rates for 54 and 59 year-old women in different occupational groups (and with a standard set of other characteristics – see note below figure). Employment rates among 54 year-old women in sales, operative and routine occupations are lower than in most other occupations but the gap falls for 59 year-olds, as is clear when examining the distance between the light and dark bars. The transition coefficients in Table 6.12, column (2), provide some evidence that for sales and routine occupations, the smaller gap is indeed because transitions out of employment are lower for older women. This perhaps reflects poor pension provision in these occupations.

Table 6.12 Associations of main occupation before 50 with employment and exits from employment for women aged 50-70 (BHPS)

	Employed or not (1)	Exits from employment (2)
O-level or more (d)	0.142**	-0.016
O-level or more* over 54 years (d)	-0.061	0.010
First partnership		
Age <25	0.054	-0.013
Age >25	-0.039	0.005
No children (d)	-0.066	-0.004
More than three children (d)	-0.070	0.013
Age entered employment		
Age <30	0.010	-0.006
Age >30	-0.127*	0.041*
Manager (d)	0.100	0.002
Professional (d)	0.138	-0.026
Associated professional (d)	0.039	-0.023
Craft (d)	-0.111	-0.001
Personal services (d)	0.009	-0.013
Sales (d)	-0.154**	0.036
Operatives (d)	-0.207**	-0.002
Routine (d)	-0.049	0.026
Manager* over 54 (d)	0.044	-0.029
Professional* over 54 (d)	-0.075	0.038
Assoc professional*over 54 (d)	0.013	0.025
Craft* over 54 (d)	0.032	0.027
Personal services* over 54 (d)	0.031	0.009
Sales* over 54 (d)	0.137*	-0.037*
Operatives*over 54 (d)	0.149*	0.004
Routine* over 54 (d)	0.134*	-0.034*
Number of observations	11,857	5,505

Notes: (d) = dummy variable (1/0); * significant at 5% level; ** significant at 1% level.

Base groups: less than O-level or no qualifications; 1-3 children; clerical occupation.

Controls also included: age, marital status, local unemployment rate and time trend.

Figure 6.3 Predicted employment rates for reference[12] women aged 54 and 59 (BHPS)

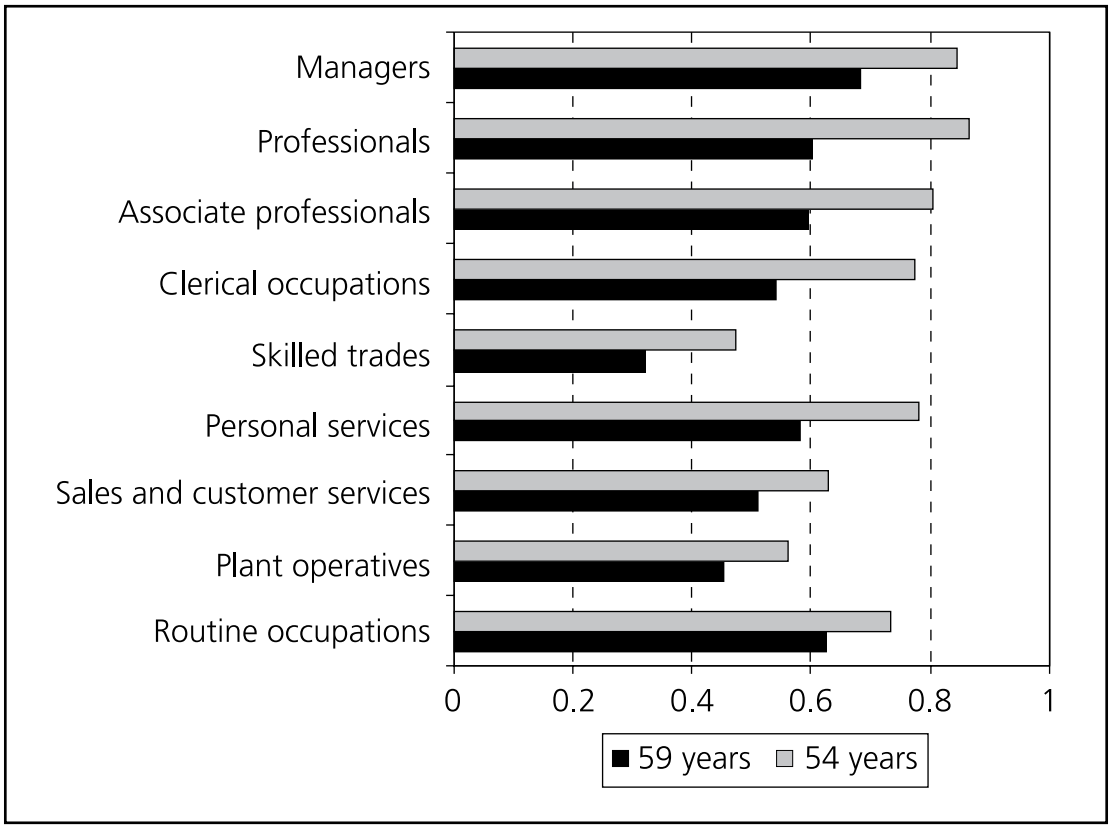


Figure 6.4 shows similar predicted probabilities for men: they are more similar across occupations and, because of the lack of age interaction effects, the fall between ages 54-59 is the same across all occupations.

12 The reference person is married with two children, has at least O-level education, started work at 16, got married at 25 and lives in an area with five per cent unemployment. The reference year is 2004.

Figure 6.4 Predicted employment rates for reference[13] men aged 54 and 59 (BHPS)

Finally it is worth considering, for women, the way that occupation mediates the effects of earlier life-course events. The main education coefficient of 0.14 in Table 6.12, column (1) is smaller than when years of employment are used as an employment history measure (0.18 in Table 6.10, column (1)), unlike for men. Similarly, the negative effects on later-life employment of early partnership formation and early labour market entry are reduced once women's main occupation is accounted for. This suggests that low education, early partnership formation and labour market entry are associated with entry into certain occupations which, in turn, determine employment in later life. For men, low education seems to be associated with more employment instability and so earlier withdrawal from employment.

6.2.4 Main industry

The final way in which we represent a person's employment history is to use the industry of their longest job before 50. Industries are classified using the 1980 SIC (Standard of Industrial Classification) system and we use the ten basic divisions (with

[13] The reference person is married with two children, has at least O-level education, started work at 16, got married at 25 and lives in an area with five per cent unemployment. The reference year is 2004.

'other manufacturing' treated as the base category in the models). The results are reported in Tables B.7 and B.8. A person's main industry seems to have less effect on their later-life employment prospects than their occupation – we find strong effects associated with agriculture (higher employment rates) and energy/water (lower employment rates) but these two groups account for only five per cent of individuals in the sample. We do, however, see that like occupation, industry affiliation can partly account for the previously noted effects among women of early partnership and labour market entry on later-life employment.

6.2.5 Partner's employment history

Since a person's own employment history influences whether they work in later life, might their partner's employment history also have an effect? This could be the case, for example, if a partner has managed to accumulate enough pension entitlements during their career to support the couple. Tables B.13 and B.14 show that, perhaps surprisingly, there is no association between the partner's employment history and a person's own employment after 50. This does not mean that the two partners' employment statuses in later life are not related. As will be shown in Chapter 7, there is some evidence that partners coordinate their retirement (see Section 7.2).

6.3 Adulthood events and later-life employment – summary

We have so far found evidence that, holding constant parental background and educational achievement, joining the labour market or starting a family later in life is associated with later withdrawal from employment. The effects are similar for men and women, although women who start work after 30 experience lower employment levels after 50 – there is evidence that this is a 'selection' effect, reflecting lower labour market attachment among this group. Having children is also associated with higher employment levels in later life. Very large families are an exception – parents are less likely to be employed after 50 but this can be explained by their weak attachment to the labour market when their children were young. There does not seem to be any effect from having children over an extended period.

A person's history of employment before age 50 is a strong predictor of their later-life employment and also acts as a mediating channel for several earlier life-course events. The number of years spent in employment is positively associated with employment after 50, suggesting that a history of stable employment reflects high underlying employability and the possession of skills that favour employment in later life. People with long employment histories should also have built up more pension entitlements (allowing them to retire earlier) but it seems this is outweighed by the general employability effect (or the desire to accumulate even more pension saving). More frequent job moves are associated with higher employment rates after 50 – perhaps reflecting difficulties in carrying pensions

across jobs. By contrast with the strong effects due to a person's employment history, we find no effects from their partner's employment history.

For men (and much less so for women) years of employment mediate previous educational attainment: being qualified leads to more stable employment and this favours later-life employment.

A person's main occupation before 50 also helps to explain later-life employment. This possibly reflects differences in pension provision across occupations. The effects are especially striking for women. Those in the 'lower' occupations have lower later-life employment rates than other occupations but the gap shrinks as they get older, suggesting that withdrawal is also slower in these occupations. For women (less so for men) occupation mediates the effect of some previous events, notably educational achievement, partnership formation and labour market entry. Previous main industrial affiliation is a less important predictor of employment in later life, though, again for women, it partly mediates the effects of early partnership and labour market entry.

7 Later life events and employment: multivariate modelling

We now turn to look at how factors closer to retirement affect the labour market position of older workers. In line with the sequential modelling approach, we estimate models that take account of previous life-course events in order to see the additional effect of these more immediate factors. We also see how they mediate the effects of previous factors. We begin in this chapter with job strains and current health status.

7.1 Job strains and health

7.1.1 Job strains

Research in other countries (i.e. the USA and Scandinavia) indicates that job strains affect when people exit employment (see Blekesaune and Solem 2005 for a review of this literature). Such effects can be investigated using either data about whether people report jobs strains or not or by using some other data about job strains which are imputed into occupational codes. We follow the latter approach, by estimating job strains from the 2004 Workplace Employment Relations Survey (WERS) and then imputing these into similar occupational codes in the BHPS. This approach avoids some possible bias in the estimates that may result if people who have already decided to exit early also report more job strains than those who decide to work for more years. In this case, the presence of job strains may serve to justify a previous decision to exit, in addition to being a genuine causal factor. The extent of this kind of bias is not clear but we guard against it by using data at the occupational (rather than individual) level.

Three job strains are investigated: job stress, job autonomy and job satisfaction. They are all indices, estimated as simple mean values for all people (i.e. men and women jointly) between 22 and 60 years in the WERS 2004. These indices are described in Appendix D. Job stress is based on two items about *'My job requires*

that I work very hard' and *'I never seem to have enough time to get my work done'*. Job autonomy is based of four items: *'how much influence do you have over (1) the tasks you do in your job, (2) the pace at which you work, (3) how you do your work, (4) the order at which you carry out tasks'*. Job satisfaction is based on two items: satisfaction with (1) *'sense of achievement you get from your work'* and (2) *'the work itself'*. All three indices are standardised (standard deviation 1 and mean 0) in the data set analysed here. Notice that a square root transformation of these indices was applied in order to avoid the results being dominated by a small number of deviant occupations, also described in Appendix D. Unfortunately, our data do not allow us to investigate effects of physical strains in the job, which has been the strongest and most consistent predictor of early retirement in some other countries (Blekesaune and Solem 2005). Previous research has found effects of low job control on the risk of coronary heart disease among British civil servants (Bosma *et al.* 1997). We do, however, look at health effects below.

We use occupational codes in the BHPS from the last job each person started before reaching 60 and lasting at least two years. Since the job strains were estimated later (2004) than most of these jobs (1991-2004) it must be assumed that job strains did not change too much in this period. Unfortunately, the BHPS and the WERS 2004 use different types of occupational codes (the Standard Occupational Classification (SOC)1990 and the SOC2000 respectively). Appendix D also describes how these two coding systems were combined.

Table 7.1 reports the effects of job strains, controlling for different measures of employment history (and the other controls listed at the bottom of the tables) and in the bottom panel for current health status as well. We discuss health effects in detail below.

The top panel of the table reports the job strain effects without any controls for employment history. High values of the job strain variables indicate more strain, so negative coefficients indicate that job strains reduce later-life employment. The pattern in the top panel is similar to that found in the exploratory analysis of Chapter 4. We find that lower job autonomy is associated with lower employment rates among women and that lower job satisfaction is associated with lower employment rates among men.

The remaining panels of the table add the alternative measures of employment history before 50. The negative effects of low job autonomy are reduced when we hold constant women's main occupation and industry. This suggests that job strains are particularly prevalent in occupations and industries which are also associated with lower employment levels in later life for other reasons (e.g. lower pension coverage). The effects of job satisfaction among men can partly be accounted for by which industry they belonged to (though not their main occupation). There is no evidence that the effects of low job autonomy or satisfaction are a reflection of having a long (or short) career before age 50 (bottom two panels).

Table 7.1 Associations of job strains with employment and exits from employment for men and women aged 50-70 (BHPS)

	Men		Women	
Strain associated with:	**Employed or not (1)**	**Exits from employment (2)**	**Employed or not (3)**	**Exits from employment (4)**
Without employment history				
Stress	-0.020	0.002	0.003	-0.000
Autonomy	-0.016	0.000	-0.034*	0.007
Satisfaction	-0.042*	0.007	-0.029*	-0.000
With main occupation				
Stress	-0.010	-0.001	0.006	-0.003
Autonomy	-0.011	-0.001	-0.025	0.006
Satisfaction	-0.042*	0.007*	-0.020	-0.001
With main industry				
Stress	-0.018	0.001	0.010	-0.002
Autonomy	-0.021	-0.001	-0.026	0.006
Satisfaction	-0.026	0.005	-0.031*	0.003
With main occupation and industry				
Stress	-0.007	-0.001	0.005	-0.002
Autonomy	-0.016	-0.001	-0.021	0.006
Satisfaction	-0.024	0.005	-0.024	0.001
With years of employment and unemployment				
Stress	-0.023	0.002	-0.015	0.001
Autonomy	-0.013	0.001	-0.033*	0.007
Satisfaction	-0.048**	0.007	-0.026	-0.001
With health status and years of employment and unemployment				
Stress	-0.029	0.002	-0.019	0.001
Autonomy	-0.018	0.000	-0.036**	0.008*
Satisfaction	-0.043*	0.006	-0.023	-0.001

* significant at 5% level; ** significant at 1% level.

Controls also included: age, marital status, parental social class (men), education, age at first partnership, number of children, age of labour market entry, local unemployment rate and time trend.

The bottom panel of the table shows that job strain effects persist when we allow for current health status, in fact the autonomy effects are slightly reinforced. So job strains seem to be measuring an independent dimension of well-being, separate from conventional health measures (as already noted, we cannot measure physical strains).

Tables B.9 and B.10 report the full estimates from the model, controlling for years of employment. Comparing those results with Tables 6.9 and 6.10, we see that the education effects are partly mediated by job strains: the education coefficients

are reduced by about 0.5 percentage point for men and one percentage point for women.

7.1.2 Health

We would expect a person's health status in later life to be an important predictor of their employment situation. In this section, we evaluate this effect and also the extent to which the earlier life-course factors operate through later life health status.

Health and disability are measured using three variables: general self-assessed health, mental distress and activities of daily living (ADL) limitations. The general health question is: *'Please think back over the last 12 months about how your health has been. Compared to people of your own age, would you say that your health has on the whole been (1) excellent, (2) good, (3) fair, (4) poor or (5) very poor?'* ADL is also measured with a single question: *'Does your health in any way limit your daily activities compared to most people of your age?'* Responses are 'yes' and 'no'. Mental distress is measured using the General Health Questionnaire which has 12 questions measuring one mental distress symptom each and the scale can have values from 0-12 symptoms. To facilitate interpretation, the two indices, 'mental distress' and 'ADL limitations' were standardised, meaning that they were rescaled to have the standard deviation equal to 1 and a mean equal to 0. We did not rescale the general health question because it already has a standard deviation close to 1 (0.96). Descriptive statistics of these variables are in Table A.1.

The results, presented in Tables 7.2 and 7.3, confirm that health status is strongly associated with employment after 50. A one standard deviation decline in general health or ADL limitations is associated with a 9-10 percentage point decrease in employment rates for both men and women (both tables, column (1)). Poor health also increases the likelihood of leaving employment from one year to the next (by about one to two percentage points; column (2)). Curiously, mental distress seems to affect men's employment status but not women's.

Health also seems to be a mediating factor for several previously documented life-course effects. This can be seen in detail by comparing these results with Tables B.9 and B.10, which omit health. For both men and women, the negative effects on employment of early partnership formation are reduced (and generally insignificant) when health is accounted for. This implies that people forming early partnerships tend to be in poorer health in later life and this partly explains their lower employment rates.

Table 7.2 Associations of current health status with employment and exits from employment for men aged 50-70 (BHPS)

	Employed or not (1)	Exits from employment (2)
O-level or more (d)	0.025	0.002
O-level or more* over 59 years (d)	-0.019	-0.000
First partnership		
Age <25	0.073	-0.016*
Age >25	0.012	-0.005
No children (d)	-0.062	0.016
More than three children (d)	-0.060	-0.005
Age entered employment		
Age <30	0.184**	-0.009
Age >30	0.056	0.018
Years employed (per five years)	0.145**	-0.004
Years unemployed	-0.034**	0.004
General health	-0.098**	0.010**
Mental distress	-0.051**	0.013**
ADL-limitations	-0.102**	0.007
Number of observations	9,148	5,498

Notes: (d) = dummy variable (1/0); * significant at 5% level; ** significant at 1% level.

Base groups: less than O-level or no qualifications; 1-3 children.

Controls also included: age, marital status, parental social class, job strains, local unemployment rate and time trend.

For men, the effects of both late labour market entry and of years of employment are reduced by around a fifth when health is controlled for. So, men who begin work early in life or who are not then continuously employed, tend to be in poorer health in their later years, reducing their employment probability. For women, there is little change in these effects.

Table 7.3 Associations of current health status with employment and exits from employment for women aged 50-70 (BHPS)

	Employed or not (1)	Exits from employment (2)
O-level or more (d)	0.149**	-0.019
O-level or more* over 54 years (d)	-0.091**	0.016
First partnership		
Age <25	0.048	-0.012
Age >25	-0.039	0.003
No children (d)	-0.168**	0.017
More than three children (d)	0.013	0.002
Age entered employment		
Age <30	0.104**	-0.016
Age >30	-0.058	0.032*
Years employed (per five years)	0.087**	-0.009**
Years unemployed	-0.003	0.000
General health	-0.091**	0.017**
Mental distress	0.006	0.004
ADL-limitations	-0.081**	0.015**
Number of observations	11,719	5,436

Notes: (d) = dummy variable (1/0); * significant at 5% level; ** significant at 1% level.

Base groups: less than O-level or no qualifications; 1-3 children.

Controls also included: age, marital status, job strains, local unemployment rate and time trend.

Are the effects of occupation also mediated by health? Tables B.11 and B.12 show models including both main occupation and health status. Comparing these to the main occupation models (without health) which we discussed in Chapter 6 (Tables 6.11 and 6.12, column (1)), we see that health is an important mediating factor for women. The negative associations with later-life employment rates of having worked in the 'lowest' occupations (especially sales and operative jobs) are substantially reduced (by five to eight percentage points) once current health is controlled for. This implies that these occupations are associated with worse health, which in turn lowers employment rates. Health only has a slight mediating influence on the effects of occupation among men.

There is also some evidence that accounting for health reduces the association of industry with employment (results not reported), although, as we found previously, a person's main industry is not one of the main predictors of later-life employment.

7.2 Other immediate factors

Finally, we explore the effect of some more immediate factors on later-life employment outcomes: partner's current employment status, availability of occupational pension and whether any work-related training has been received.

7.2.1 Partner's employment status

Section 6.2 noted that among couples, the partner's employment history did not predict a person's own later-life employment. But is there any evidence that couple's coordinate their labour market withdrawal closer to retirement? In Tables 7.4 and 7.5 we add a dummy variable for whether or not the partner works (this variables takes value zero for non-partnered people). The results show that partners' employment outcomes are strongly correlated. The probability of employment for both men and women is raised by about 24 percentage points if the partner works (column (1)). It is difficult, however, to interpret this in a simple way since the causality will run in both directions (between partners) if they decide together when to retire. In this case, one partner will encourage the other partner's decision, which in turn will reinforce the first partner's decision. The estimated coefficients capture the full effect of this joint decision rather the causal effect which would apply if, say, one partner lost their job and this affected the employment status of the other.

Is there evidence that partners arrange to retire around the same time? The raw data show that, on average, husbands withdraw from employment about five years later than their wives (consistent with the difference in State Pension ages).[14] However, this average figure hides much heterogeneity, indeed around a quarter of husbands stop work after their wives. The transitions estimates in the tables (column (2)) show that the probability of leaving work rises dramatically (by four to six percentage points) when a partner stops work.

[14] 'Husbands and wives' include cohabiting partners.

Table 7.4 Associations of partner's current employment status with employment and exits from employment for men aged 50-70 (BHPS)

	Employed or not (1)	Exits from employment (2)
O-level or more (d)	0.016	0.001
O-level or more* over 59 years (d)	0.008	-0.002
First partnership		
Age <25	0.060	-0.014*
Age >25	0.008	-0.003
No children (d)	-0.052	0.013
More than three children (d)	-0.056	-0.007
Age entered employment		
Age <30	0.168**	-0.005
Age >30	0.044	0.019
Years employed (per five years)	0.136**	-0.002
Years unemployed	-0.032*	0.003
Partner has job (d)	0.233**	-0.042**
Number of observations	9,118	5,481

Notes: (d) = dummy variable (1/0); * significant at 5% level; ** significant at 1% level.

Base groups: less than O-level or no qualifications; 1-3 children; partner not working.

Controls also included: age, marital status, parental social class, job strains, current health, local unemployment rate and time trend.

Table C.15 looks at the effect of a partner's exit timing on the probability of an individual leaving the labour market. The sample size in this table is smaller because it is necessary to match individuals to their partners, and also to have complete employment histories for the partners (in order to determine their exit date). The results show that an individual's exit probability is increased by eight to ten percentage points if their partner stopped work within the last year. There is no effect if the partner left employment more than a year previously. This suggests that couples do coordinate their labour market withdrawal to some extent.

Table 7.5 Associations of partner's current employment status with employment and exits from employment for women aged 50-70 (BHPS)

	Employed or not (1)	Exits from employment (2)
O-level or more (d)	0.147**	-0.015
O-level or more* over 54 years (d)	-0.086**	0.010
First partnership		
Age <25	0.034	-0.006
Age >25	-0.036	-0.000
No children (d)	-0.152**	0.013
More than three children (d)	0.026	-0.002
Age entered employment		
Age <30	0.114**	-0.018*
Age >30	-0.085	0.038*
Years employed (per five years)	0.089**	-0.009**
Years unemployed	0.007	-0.000
Partner has job (d)	0.239**	-0.059**
Number of observations	11,657	5,415

Notes: (d) = dummy variable (1/0); * significant at 5% level; ** significant at 1% level.

Base groups: less than O-level or no qualifications; 1-3 children; partner not working.

Controls also included: age, marital status, job strains, current health, local unemployment rate and time trend.

7.2.2 Pension scheme membership and savings behaviour

The BHPS has rather limited information about pension savings and pension entitlements. There is a single question asking if employed respondents are members of a pension scheme. But less than half of those currently working have answered this question, some of whom may be self-employed. Many people have answered yes or no in some but not in all the waves they participate in. For these reasons, if a person reports being member of a superannuation scheme in any wave it is assumed that that this person has some superannuation entitlements (savings) throughout the observation period. If a person never reports 'yes' to this question it is assumed that this person does not have any such pension entitlements. If all waves have missing information in this question, the person does not enter this analysis. This procedure includes 66 per cent of the yearly observations and 58 per cent of the individuals in the analysis of transitions out of employment. We skip the analysis of employment using these data since they would not be comparable with other analyses of employment in this report. (We would have no data for those already out of employment.) Saving behaviour is treated differently. Here we use the proportion of waves in which the individual is observed to be saving while still being employed, thus giving the value 0 if not saving in any wave, 1 if saving in all waves observed or 0.5 if saving in half of the waves. Eighty-seven per cent of the men and 71 per cent of the women have some occupational saving, whereas 52 per cent save in any single wave, as indicated by Table A.1.

We find only a very weak relationship in the data between membership of a pension scheme and transitions out of employment (Table 7.6). Membership of a scheme is associated with a 0.6 percentage point higher probability of exiting employment, but the coefficient is not statistically significant. This rather inconclusive result is perhaps due to the data limitations described above but it should also be borne in mind that the model controls for many life-course factors which themselves will help determine pension coverage. We find stronger evidence for saving behaviour, at least for men: those saving from their income are two percentage points more likely to exit employment than men not saving (column (1)). No such correlation is found among women.

Table 7.6 Associations of pension availability and saving with exits from employment for men and women aged 50-70 (BHPS)

	Men (1)	Women (2)
O-level or more (d)	-0.004	-0.011
O-level or more* over 59 years (d)	0.008	0.011
First partnership		
Age <25	-0.010	-0.009
Age >25	-0.006	-0.004
No children (d)	0.018	0.022
More than three children (d)	0.005	0.001
Age entered employment		
Age <30	0.010	-0.010
Age >30	0.032*	0.015
Years employed (per five years)	0.014	-0.002
Years unemployed	0.003	0.001
Occupational pension (d)	0.006	0.006
Saves from income	0.022**	0.003
Number of observations	3,983	4,010

Notes: (d) = dummy variable (1/0); * significant at 5% level; ** significant at 1% level.

Base groups: less than O-level or no qualifications; 1-3 children; no pension.

Controls also included: parental social class (men), age, marital status, local unemployment rate and time trend.

7.2.3 Training and acquisition of qualifications

Given our evidence that more highly educated workers and those with more past experience tend to have longer working lives, acquisition of new skills in later life may also help delay exit from the labour market. Phillipson and Smith (2005) argued that older workers are disadvantaged in terms of training and that better access and information about training could help them stay longer in employment. In our data, around a quarter of 50-70 year-old workers receive training in a given year (though the training rate falls sharply with age); however, under three

per cent receive any new qualifications. Table 7.7 shows there is some evidence that the receipt of training is associated with delayed exit from employment for women: the probability of an exit is two percentage points lower if training was received (column (2)). The effect for men is not statistically significant and in fact the coefficient is positive (column (1)). For both men and women, the receipt of new qualifications is associated with delayed exit but the coefficients are not statistically significant. It is important to bear in mind that these relationships cannot be interpreted 'causally', since people who expect to carry on in work will be more likely to seek and be offered training than those who expect to stop work.

Table 7.7 Associations of training receipt and acquisition of new qualifications with exits from employment for men and women aged 50-70 (BHPS)

	Training		New qualifications	
	Men (1)	**Women (2)**	**Men (3)**	**Women (4)**
O-level or more (d)	-0.001	-0.019	0.002	-0.021
O-level or more* over 59 years (d)	0.007	0.012	0.001	0.013
First partnership				
Age <25	-0.015	-0.021	-0.018*	-0.018*
Age >25	-0.007	0.006	-0.006	0.004
No children (d)	0.026*	0.020	0.020*	0.015
More than three children (d)	0.007	0.006	-0.002	0.006
Age entered employment				
Age <30	0.004	-0.017	-0.010	-0.017
Age >30	0.011	0.049*	0.013	0.035
Years employed (per five years)	0.009	-0.009*	-0.003	-0.009**
Years unemployed	0.004	0.001	0.005	0.001
Received training (d)	0.012	-0.019*		
Acquired new qualifications (d)			-0.015	-0.029
Number of observations	4,637	4,531	5,511	5,441

Notes: (d) = dummy variable (1/0); * significant at 5% level; ** significant at 1% level.

Base groups: less than O-level or no qualifications; 1-3 children.

Controls also included: parental social class (men), age, marital status, local unemployment rate and time trend.

7.3 Later-life events and employment – summary

Job strains experienced later in people's careers help explain their likelihood of staying in employment: women in jobs with low autonomy and men in unsatisfying jobs have lower employment rates in later life. However, it appears that job strains are particularly prevalent in occupations and industries which lead to

earlier retirement for other reasons and so it is difficult to make a clear separation between job strains and occupation/industry effects.[15]

Being in poor health after 50 is very strongly associated with being out of employment already or with leaving employment and several earlier life-course events affect later employment via their effect on health. For both men and women, early partnership effects are reduced once we control for health status. Among men, early entry to the labour market and a lack of continuous employment are related to poor health and hence, to lower levels of later-life employment. Among women, rather than employment stability, it is their main occupation which is associated with later health and hence, employment outcomes. Even after controlling for health we still find that childless women have substantially lower later-life employment rates – this effect does not seem to reflect poor health among these women. Finally, job strains (those we have been able to measure) act independently of health and so appear to reflect a separate dimension of individual capability.

The effect a spouse's employment history on an individual's later-life employment is minimal. A spouse's **current** employment status is strongly correlated with an individual's employment – but causality probably runs in both directions since it is likely that spouses coordinate their retirement decisions. There is some evidence of a preference for spouses to retire together (though on aggregate, women retire before men).

After controlling for family and employment history and education, we find only a little evidence that having an occupational pension increases transitions out of work. However, our data on pension scheme membership are limited. We find stronger evidence that saving from income increases transitions for men.

We find some evidence that having received training in the last year is associated with fewer exits from employment among women (two percentage point lower exit probability). The acquisition of new qualifications is associated with fewer exits among women and men but the estimates do not reach statistical significance. These correlations cannot be interpreted causally since individuals expecting to continue in work are more likely to seek, be offered and take up training.

[15] It is especially difficult in our data, since job strains are matched in at (detailed) occupational level.

8 Discussion and conclusions

Our aim in this study was to identify how key events at different points in the life cycle were associated with later-life employment. Further, we aimed to investigate whether early-life events had an effect in their own right or instead, were primarily related to other factors later in life which influenced labour market withdrawal more immediately. We find that both early events and later mediating factors play a role, with marked differences in the relative importance of different factors between men and women. The findings should help to inform policy, although their specific implications will depend on what types of policies are envisaged and over what timescales. For example, if the policy horizon is a few decades from now, then our results point to some factors which could encourage longer working lives among those currently at the beginning of their careers or even before. Policy in this case would generally involve interventions to change individuals' 'characteristics' (the explanatory variables in the analysis), such as their educational achievement. If the focus of policy is more on the medium-term, aiming to extend the working lives of those already in their 50s or 60s, the results suggest some other areas which could be targeted, for example occupational health. But for this older age group, effective interventions may need to focus more on changing the **effects** of peoples' characteristics (estimated as the 'coefficients' in the analysis) than on changing the **characteristics themselves** – most of which were fixed earlier in life. An example might be trying to raise the current employability of those with patchy job records and low skills over a previous period.

The life-course approach pursued in this report has identified some life-cycle events which appear to have a strong influence on later-life employment but also some events which, perhaps surprisingly, do not seem important (such as the timing of divorce and age at which parents stop having child). While the findings provide an informative background for policy making, they clearly do not constitute simple 'recipes' for new policies. Life-course analysis is necessarily based on previous cohorts (those born before the mid 1950s in our case); and so the findings cannot automatically be generalised to future retirees (especially when considering the

effects of early-life factors). There have been major changes in the labour market over the past few decades and in particular changes to pension provision, which could alter the relationships found here. More recent cohorts also enter the labour market with different characteristics – in particular, they are better qualified and this may reduce the 'returns' to further increases in education. Similarly, the typical employment trajectory involves more job and employer mobility than previously.

We now turn to some key results with potential policy implications. A persistent finding throughout the analysis is that becoming 'established' later in life is associated with a later end to one's career. This applies to the timing of a person's first partnership but especially to the age at labour market entry and the results generally remain even after controlling for subsequent life events (in particular for men). For women, in addition to the other factors considered, educational achievement strongly favours later withdrawal. Given the expansion of higher education in the UK (and consequent later labour market entry), there could be an automatic tendency for people to withdraw from the labour market at later ages in future. Reducing the proportion of people with no, or very low, qualifications could also further boost later-life employment rates – although, as already noted, this proportion is already much lower among more recent cohorts. Given the debates about raising the effective school leaving age, a natural question is how this might affect later-life employment. While it is difficult to extrapolate from the past, our results suggest that this could favour extended careers, first by delaying labour market entry and second by reducing the proportion of those with low qualifications.

We also found that having children is associated with later withdrawal from employment, consistent with the idea that children represent a financial commitment which reduces retirement saving. If children are now more costly than in previous cohorts (for example, due to the need to fund them through university) this may be another factor which promotes later-life employment.

The analysis highlights the importance of employment stability and occupational factors for later-life employment. Indeed, several earlier life events affect labour market withdrawal via their effect on a person's experience in the labour market. Among men, employment stability seems to count the most and strongly reflects previous educational attainment. Among women, occupation plays a key role and mediates not only the effects of education but also the timing of partnership formation and labour market entry. Women in the 'lower' occupations are less likely to be in work at older ages – probably because these occupations are associated with job strains and poor health in later life. These occupations represent nearly 30 per cent of working women and so could be an important target group. Health emerges as a major factor in explaining early withdrawal from employment. Since health often reflects earlier experience in the labour market, this underlines the potential gains from addressing occupational health issues.

Among women in particular, we found that the employment gap between those with and without qualifications, as well as between the 'lower' and 'higher' occupational groups, was larger in their early 50s than at later ages. 'This would

suggest that policy to help lower skilled women should be targeted on middle-aged workers (around 50) rather than the older age group (around 60). As mentioned, the occupational gap is related to health outcomes.

Finally, we have found complementarities between partners' later-life employment behaviour and some evidence of a preference for retiring together. This suggests that if one partner extends their working life, there may be a secondary effect which extends the other partner's employment too.

The analysis raises questions which could usefully be addressed in future research. First, we have hypothesised that several early-life events, such as the timing of labour market entry, may affect later employment because they influence pension saving. Unfortunately, the BHPS has only limited information on pension entitlements (and the LS has none), and so we have not been able to test these possibilities. The English Longitudinal Study of Ageing (ELSA) does collect detailed information about pension scheme membership and saving but only began collecting retrospective life-history data in 2007. Once the new ELSA data are available, future research could use them to examine pension entitlements as a mediating factor in more detail.

A second area which could be extended would be to look in more detail at the destinations of those exiting work and to see whether the effects of life-course events differ across destinations. This would be especially relevant if there were more policy concern about those exiting, say, to long-term sickness than those choosing early retirement options under occupational pension schemes. Equally, there may be less concern about individuals stopping work to care for a sick partner, especially if care would otherwise have to be provided from outside. It would also be useful to examine exit from the labour market according to whether it is perceived to be a positive or negative event by the individual worker. Identifying cases of 'forced' exit and the life-course events leading to them could help to target policy more effectively. A more detailed analysis along these lines would probably need more data on destinations and preferences than are available in the British Household Panel Survey (BHPS). Again, ELSA would be a likely candidate dataset. The results in the present study could be used as a baseline from which to develop more specific models of labour market withdrawal.

Appendix A Descriptive statistics

British Household Panel Survey

Table A.1 Outcome variables and more immediate predictors, individuals aged 50-70 (wave 1-14), mean values or percentages (BHPS)

	Men	Women	Minimum	Maximum
Employed or not	55.4%	49.7%	0	1
Exiting employment	6.0%	8.1%	0	1
Age	59.0	59.3	50	70
State pension age (d)	23.7%	46.8%	0	1
Married/cohabiting (d)	83.1%	70.5%	0	1
Widowed (d)	3.2%	14.0%	0	1
Divorced/separated (d)	7.8%	10.4%	0	1
Never married (d)	5.9%	5.1%	0	1
General health	2.3	2.3	1	5
Mental distress	-0.1	0.0	-0.6	3.6
ADL-limitations	-0.0	0.0	-1.3	5.6
Occupational pension (d)	87.0%	70.8%	0	1
Saves from income	52.4%	52.3%	0	1
Job stress	-0.1	0.1	-2.9	2.4
Job autonomy	-0.0	0.0	-2.3	3.2
Job satisfaction	0.1	-0.1	-2.7	2.5
Travel-to-work-area unemployment rate	5.1	5.1	0.4	17.0
Training in last year (d)	22.4%	27.0%	1	0
New qual in last year (d)	2.6%	2.7%	1	0
Maximum number of observations	13,320	14,773		
Maximum number of people	2,129	2,342		

Notes: d = dummy variables (1/0).

Table A.2 Life-course variables, individuals aged 50-70 (wave 1-14), mean values or percentages (BHPS)

	Men	Women	Minimum	Maximum
With lone parent at age 14 (d)	9.8%	9.8%	0	1
Father not working when 14 (d)	2.0%	3.0%	0	1
Parental social class				
Higher salariat (d)	8.0%	10.0%	0	1
Lower salariat (d)	8.8%	7.7%	0	1
Routine non-manual (d)	3.9%	4.6%	0	1
Petty bourgeoisie (d)	13.1%	13.0%	0	1
Man foremen and technicians (d)	16.5%	16.5%	0	1
Skilled manual (d)	22.0%	20.0%	0	1
Semi- and unskilled manual (d)	27.7%	28.1%	0	1
Main occupation				
Manager (d)	11.4%	4.9%	0	1
Professional (d)	8.4%	8.2%	0	1
Associated professional (d)	6.9%	8.2%	0	1
Clerical (d)	8.5%	32.2%	0	1
Skilled trade (d)	29.3%	7.4%	0	1
Personal services (d)	6.8%	10.5%	0	1
Sales (d)	5.7%	9.6%	0	1
Operatives (d)	5.3%	8.7%	0	1
Routine (d)	7.8%	10.3%	0	1
Highest qualification				
No qualification (d)	34.2%	43.6%	0	1
Less than O-level (d)	1.6%	9.1%	0	1
O-level (d)	12.9%	16.4%	0	1
A-level (d)	40.4%	19.4%	0	1
Degree (d)	10.9%	11.5%	0	1
Number of previous partnerships	0.6	0.6	0	8
Age first partnership	25.5	22.8	11	50
Number of children	2.0	2.0	0	11
Age had first child	27.1	22.6	15	50
Age had last child	31.9	29.4	17	50
Age started first job	16.1	16.1	12	47
Years employed (before 50 years)	31.7	22.9	0	37.5
Years unemployed (before 50 years)	0.4	0.3	0	23.3
Maximum number of observations	13,320	14,773		
Maximum number of people	2,129	2,342		

Notes: d = dummy variables (1/0).

ONS Longitudinal Study

Table A.3 Descriptive statistics for people aged 50-70 and linked in all Censuses from 1971 to 2001, mean values or percentages (LS)

	Men	Women
Dependent variables		
Employed or not 2001	55.5%	41.4%
Exiting employment 1991-2001	37.4%	45.7%
Statistical control variables		
Age	59.2	59.2
State Pension age	24.1%	46.4%
Married/cohabiting	82.8%	73.5%
Widowed	3.1%	11.5%
Divorced/separated	8.2%	7.4%
Never married	6.5%	4.2%
Life-course variables		
Previous unemployed (0-3)	0.16	0.08
Previous sick/disabled (0-3)	0.07	0.06
Age when having a first child	27.1	24.7
Largest number of children in one Census	2.1	2.0
Degree (d)	15.5%	14.0%
A-level or equivalent (d)	3.8%	2.8%
O-level or equivalent (d)	27.9%	20.7%
Less than O-level or equivalent (d)	9.3%	10.1%
No qualifications (d)	44.5%	52.4%
Number of people	48,594	51,924

Notes: d = dummy variables (1/0).

Source: ONS Longitudinal Study. Authors' analysis.

Appendix B
Additional BHPS estimates

Education without parental social class

Table B.1 Associations of education with employment and exits from employment for men aged 50-70 (BHPS)

	Employed or not (1)	Exits from employment (2)
Age 50-55	-0.100**	0.021
Age 55-60	-0.213**	0.042**
Age 60-65	-0.231**	0.025
Age 65-70	-0.128**	-0.100**
State Pension age (d)	-0.176**	0.117**
Widowed (d)	-0.062	0.011
Separated/divorced (d)	-0.157**	0.014
Never married (d)	-0.171**	0.033*
Year trend	-0.010**	0.002*
Local unemployment rate	-0.022**	0.004**
O-level or more (d)	0.139**	-0.007
O-level or more* over 59 years (d)	-0.055	0.007
Number of observations	13,275	7,816

Notes: (d) = dummy variable (1/0); * significant at 5% level; ** significant at 1% level.
Base groups: married/cohabiting; less than O-level or no qualifications.

Table B.2 Associations of education with employment and exits from employment for women aged 50-70 (BHPS)

	Employed or not (1)	Exits from employment (2)
Age 50-55	-0.055*	0.003
Age 55-60	-0.172**	0.055**
Age 60-65	-0.232**	0.013
Age 65-70	-0.199**	-0.018
State Pension age (d)	-0.075**	0.045*
Widowed (d)	-0.035	-0.010
Separated/divorced (d)	0.028	-0.008
Never married (d)	-0.090*	0.001
Year trend	-0.006	0.004**
Local unemployment rate	-0.011**	0.004**
O-level or more (d)	0.216**	-0.025*
O-level or more* over 54 years (d)	-0.081**	0.011
Number of observations	14,678	6,559

Notes: (d) = dummy variable (1/0); * significant at 5% level; ** significant at 1% level.

Base groups: married/cohabiting; less than O-level or no qualifications.

Number of employers

Table B.3 Associations of number of employers before 50 with employment and exits from employment for men aged 50-70 (BHPS)

	Employed or not (1)	Exits from employment (2)
O-level or more (d)	0.052	0.001
O-level or more* over 59 years (d)	0.000	0.001
First partnership		
Age <25	0.095*	-0.016*
Age >25	0.014	-0.006
No children (d)	-0.066	0.019*
More than three children (d)	-0.089*	0.000
Age entered employment		
Age <30	0.251**	-0.010
Age >30	0.148	0.011
Years employed (per five years)	0.200**	-0.002
Years unemployed	-0.028*	0.005
Number of employers	0.016**	-0.002*
Number of observations	10,030	5,999

Notes: (d) = dummy variable (1/0); * significant at 5% level; ** significant at 1% level.

Base groups: less than O-level or no qualifications; 1-3 children.

Controls also included: parental social class, age, marital status, local unemployment rate and time trend .

Table B.4 Associations of number of employers before 50 with employment and exits from employment for women aged 50-70 (BHPS)

	Employed or not (1)	Exits from employment (2)
O-level or more (d)	0.167**	-0.021
O-level or more* over 54 years (d)	-0.078**	0.013
First partnership		
Age <25	0.075*	-0.016
Age >25	-0.046	0.003
No children (d)	-0.141**	0.015
More than three children (d)	-0.001	0.003
Age entered employment		
Age <30	0.109**	-0.016
Age >30	-0.073	0.031
Years employed (per five years)	0.075**	-0.008**
Years unemployed	-0.002	0.001
Number of employers	0.019**	-0.001
Number of observations	12,818	5,895

Notes: (d) = dummy variable (1/0); * significant at 5% level; ** significant at 1% level
Base groups: less than O-level or no qualifications; 1-3 children
Controls also included: age, marital status, local unemployment rate and time trend

Time since unemployment

Table B.5 Associations of timing of last unemployment spell before 50 with employment and exits from employment for men aged 50-70 (BHPS)

	Employed or not (1)	Exits from employment (2)
O-level or more (d)	0.056	0.000
O-level or more* over 59 years (d)	-0.006	0.001
First partnership		
Age <25	0.088*	-0.016*
Age >25	0.016	-0.006
No children (d)	-0.062	0.018
More than three children (d)	-0.068	-0.002
Age entered employment		
Age <30	0.231**	-0.008
Age >30	0.147	0.012
Years employed (per five years)	0.198**	-0.002
Years unemployed	-0.029*	0.005
Years since unemployed	0.004*	-0.001
Number of observations	10,030	5,999

Notes: (d) = dummy variable (1/0); * significant at 5% level; ** significant at 1% level.

Base groups: less than O-level or no qualifications; 1-3 children.

Controls also included: parental social class, age, marital status, local unemployment rate and time trend.

Table B.6 Associations of timing of last unemployment spell before 50 with employment and exits from employment for women aged 50-70 (BHPS)

	Employed or not (1)	Exits from employment (2)
O-level or more (d)	0.177**	-0.021
O-level or more* over 54 years (d)	-0.083**	0.013
First partnership		
Age <25	0.077*	-0.017*
Age >25	-0.047	0.003
No children (d)	-0.167**	0.017
More than three children (d)	0.011	0.002
Age entered employment		
Age <30	0.100**	-0.015
Age >30	-0.068	0.030
Years employed (per five years)	0.089**	-0.009**
Years unemployed	-0.004	0.002
Years since unemployed	0.003	-0.000
Number of observations	12,818	5,895

Notes: (d) = dummy variable (1/0); * significant at 5% level; ** significant at 1% level

Base groups: less than O-level or no qualifications; 1-3 children

Controls also included: age, marital status, local unemployment rate and time trend

Main industry

Table B.7 Associations of main industry before 50 with employment and exits from employment for men aged 50-70 (BHPS)

	Employed or not (1)	Exits from employment (2)
O-level or more (d)	0.108**	-0.005
O-level or more* over 59 years (d)	-0.018	-0.003
First partnership		
Age <25	0.091*	-0.018*
Age >25	0.006	-0.008
No children (d)	-0.044	0.015
More than three children (d)	-0.098*	0.001
Age entered employment		
Age <30	0.055	-0.005
Age >30	-0.023	0.011
Agriculture (d)	0.217**	-0.009
Energy and water (d)	-0.377**	0.098**
Mineral extract (d)	-0.100	0.018

Continued

Table B.7 Continued

	Employed or not (1)	Exits from employment (2)
Metal and engineering (d)	-0.005	0.015
Construction (d)	-0.009	0.006
Dist and hotels (d)	0.002	0.004
Transp/comms (d)	0.023	0.013
Banking and finance (d)	-0.129	0.013
Other services (d)	-0.125*	0.017
Number of observations	8,764	5,136

Notes: (d) = dummy variable (1/0); * significant at 5% level; ** significant at 1% level.

Base groups: less than O-level or no qualifications; 1-3 children; manufacturing excluding metal and engineering.

Controls also included: parental social class, age, marital status, local unemployment rate and time trend.

Table B.8 Associations of main industry before 50 with employment and exits from employment for women aged 50-70 (BHPS)

	Employed or not (1)	Exits from employment (2)
O-level or more (d)	0.182**	-0.029*
O-level or more* over 54 years (d)	-0.101**	0.022
First partnership		
Age <25	0.051	-0.015
Age >25	-0.030	0.003
No children (d)	-0.075	-0.002
More than three children (d)	-0.065	0.007
Age entered employment		
Age <30	0.018	-0.008
Age >30	-0.129*	0.044*
Agriculture (d)	0.307**	-0.035*
Energy and water (d)	0.075	0.046
Mineral extract (d)	0.002	-0.024
Metal and engineering (d)	0.056	-0.007
Construction (d)	0.091	0.047
Distribution and hotels (d)	0.041	-0.004
Transport/communications (d)	-0.062	0.059
Banking and finance (d)	0.082	-0.015
Other services (d)	0.094*	-0.003
Number of observations	11,372	5,152

Notes: (d) = dummy variable (1/0); * significant at 5% level; ** significant at 1% level.

Base groups: less than O-level or no qualifications; 1-3 children; manufacturing excluding metal and engineering.

Controls also included: age, marital status, local unemployment rate and time trend.

Job strains

Table B.9 Associations of job strains with employment and exits from employment for men aged 50-70 (BHPS)

	Employed or not (1)	Exits from employment (2)
O-level or more (d)	0.051	0.001
O-level or more* over 59 years (d)	-0.013	0.000
First partnership		
Age <25	0.091*	-0.015*
Age >25	0.019	-0.006
No children (d)	-0.079	0.020*
More than three children (d)	-0.077	0.000
Age entered employment		
Age <30	0.233**	-0.008
Age >30	0.113	0.016
Years employed (per five years)	0.192**	-0.001
Years unemployed	-0.029*	0.005
Job stress	-0.023	0.002
Job autonomy	-0.013	0.001
Job satisfaction	-0.048**	0.007
Number of observations	9,885	5,948

Notes: (d) = dummy variable (1/0); * significant at 5% level; ** significant at 1% level.

Base groups: less than O-level or no qualifications; 1-3 children.

Controls also included: parental social class, age, marital status, local unemployment rate and time trend.

Table B.10 Associations of job strains with employment and exits from employment for women aged 50-70 (BHPS)

	Employed or not (1)	Exits from employment (2)
O-level or more (d)	0.164**	-0.020
O-level or more* over 54 years (d)	-0.085**	0.014
First partnership		
Age <25	0.079**	-0.017*
Age >25	-0.055	0.004
No children (d)	-0.160**	0.019
More than three children (d)	0.001	0.003
Age entered employment		
Age <30	0.099**	-0.015
Age >30	-0.066	0.031
Years employed (per five years)	0.086**	-0.009**
Years unemployed	-0.003	0.001

Continued

Table B.10 Continued

	Employed or not (1)	Exits from employment (2)
Job stress	-0.015	0.001
Job autonomy	-0.033*	0.007
Job satisfaction	-0.026	-0.001
Number of observations	12,645	5,890

Notes: (d) = dummy variable (1/0); * significant at 5% level; ** significant at 1% level.

Base groups: less than O-level or no qualifications; 1-3 children.

Controls also included: age, marital status, local unemployment rate and time trend.

Health and main occupation

Table B.11 Associations of main occupation before 50 with employment and exits from employment for men aged 50-70 (BHPS)

	Employed or not (1)	Exits from employment (2)
O-level or more (d)	0.068	0.000
O-level or more* over 59 years (d)	-0.038	-0.001
First partnership		
Age <25	0.080	-0.019**
Age >25	-0.002	-0.006
No children (d)	-0.026	0.015
More than three children (d)	-0.077	-0.004
Age entered employment		
Age <30	0.071*	-0.010
Age >30	-0.107	0.026*
Job stress	-0.017	-0.001
Job autonomy	-0.015	-0.001
Job satisfaction	-0.037*	0.007*
General health	-0.109**	0.010**
Mental distress	-0.046**	0.011**
ADL-limitations	-0.108**	0.005
Manager (d)	0.004	-0.001
Professional (d)	-0.153*	0.024
Associated professional (d)	-0.056	-0.004
Clerical (d)	-0.123*	0.007
Personal services (d)	-0.043	0.010
Sales (d)	0.063	-0.019*
Operatives (d)	-0.004	-0.004
Routine (d)	0.007	0.008
Number of observations	8,501	5,067

Notes: (d) = dummy variable (1/0); * significant at 5% level; ** significant at 1% level.

Base groups: less than O-level or no qualifications; 1-3 children; skilled trade/craft occupation.

Controls also included: parental social class, age, marital status, local unemployment rate and time trend.

Table B.12 Associations of main occupation before 50 with employment and exits from employment for women aged 50-70 (BHPS)

	Employed or not (1)	Exits from employment (2)
O-level or more (d)	0.126**	-0.010
O-level or more* over 54 years (d)	-0.069*	0.008
First partnership		
Age <25	0.020	-0.006
Age >25	-0.021	0.000
No children (d)	-0.070	-0.003
More than three children (d)	-0.067	0.012
Age entered employment		
Age <30	0.014	-0.005
Age >30	-0.111*	0.040*
Job stress	0.003	-0.003
Job autonomy	-0.029	0.008
Job satisfaction	-0.016	-0.002
General health	-0.093**	0.018**
Mental distress	0.009	0.005
ADL-limitations	-0.080**	0.016**
Manager (d)	0.060	0.030
Professional (d)	0.108	-0.021
Associated professional (d)	0.053	-0.030
Craft (d)	-0.065	0.007
Personal services (d)	0.036	-0.010
Sales (d)	-0.102*	0.026
Operatives (d)	-0.128*	-0.008
Routine (d)	-0.023	0.026
Manager* over 54 (d)	0.082	-0.044**
Professional* over 54 (d)	-0.073	0.035
Associated professional*over 54 (d)	-0.038	0.056
Craft* over 54 (d)	-0.000	0.021
Personal services* over 54 (d)	0.013	0.001
Sales* over 54 (d)	0.117	-0.029
Operatives*over 54 (d)	0.114	0.010
Routine* over 54 (d)	0.122	-0.036*
Number of observations	10,967	5,073

Notes: (d) = dummy variable (1/0); * significant at 5% level; ** significant at 1% level.
Base groups: less than O-level or no qualifications; 1-3 children; clerical occupation.
Controls also included: age, marital status, local unemployment rate and time trend.

Partner's employment history

Table B.13 Associations of partner's employment history with employment and exits from employment for men aged 50-70 (BHPS)

	Employed or not (1)	Exits from employment (2)
O-level or more (d)	0.064	-0.002
O-level or more* over 59 years (d)	-0.004	0.002
First partnership		
Age <25	0.076	-0.015
Age >25	0.015	-0.004
No children (d)	-0.063	0.017
More than three children (d)	-0.031	-0.009
Age entered employment		
Age <30	0.209**	-0.001
Age >30	0.162	0.002
Years employed (per five years)	0.183**	0.002
Years unemployed	-0.020	0.006
Spouse's years employed (per five years)	-0.001	0.000
Spouse's years unemployed	-0.002	-0.004
Number of observations	8,070	4,531

Notes: (d) = dummy variable (1/0); * significant at 5% level; ** significant at 1% level.

Base groups: less than O-level or no qualifications; 1-3 children.

Controls also included: parental social class, age, marital status, local unemployment rate and time trend.

Table B.14 Associations of partner's employment history with employment and exits from employment for women aged 50-70 (BHPS)

	Employed or not (1)	Exits from employment (2)
O-level or more (d)	0.184**	-0.018
O-level or more* over 54 years (d)	-0.088**	0.011
First partnership		
Age <25	0.078*	-0.022*
Age >25	-0.055	0.010
No children (d)	-0.144**	0.010
More than three children (d)	-0.004	0.002
Age entered employment		
Age <30	0.096**	-0.013
Age >30	-0.081	0.032*
Years employed (per five years)	0.089**	-0.010**
Years unemployed	0.006	0.001
Spouse's years employed (per five years)	0.014	-0.005
Spouse's years unemployed	0.001	0.001
Number of observations	10,810	5,033

Notes: (d) = dummy variable (1/0); * significant at 5% level; ** significant at 1% level.
Base groups: less than O-level or no qualifications; 1-3 children.
Controls also included: age, marital status, local unemployment rate and time trend.

Timing of partner's exit from employment

Table B.15 Associations of partner's exit timing with exits from employment for men and women aged 50-70 (BHPS)

	Men	Women
O-level or more (d)	-0.003	-0.014
O-level or more* over 59 years (d)	0.012	0.017
First partnership		
Age <25	-0.011	-0.016
Age >25	0.003	0.007
No children (d)	0.010	0.011
More than three children (d)	-0.009	-0.009
Age entered employment		
Age <30	0.006	-0.019*
Age >30	0.017	0.048**
Years employed (per five years)	0.005	-0.008*
Years unemployed	0.001	0.003
Spouse exited >5 years ago	0.006	-0.022

Continued

Table B.15 Continued

	Men	Women
Spouse exited 1-5 years ago	0.001	0.002
Spouse exited within last year	0.082*	0.100*
Spouse has job	-0.032*	-0.057**
Number of observations	3,188	3,732

Notes: (d) = dummy variable (1/0); * significant at 5% level; ** significant at 1% level.

Base groups: less than O-level or no qualifications; 1-3 children.

Controls also included: parental social class (men), age, marital status, job strains, health, local unemployment rate and time trend.

Number of previous partners

Table B.16 Associations of number of previous partners with employment and exits from employment for men aged 50-70 (BHPS)

	Employed or not (1)	Exits from employment (2)
O-level or more (d)	0.107**	-0.002
O-level or more* over 59 years (d)	-0.042	0.004
First partnership		
Age <25	0.090*	-0.017*
Age >25	-0.009	0.003
Number of previous partners	0.006	0.000
Number of observations	10,698	6,449

Notes: (d) = dummy variable (1/0); * significant at 5% level; ** significant at 1% level.

Base groups: less than O-level or no qualifications.

Controls also included: parental social class, age, marital status, local unemployment rate and time trend.

Table B.17 Associations of number of previous partners with employment and exits from employment for women aged 50-70 (BHPS)

	Employed or not (1)	Exits from employment (2)
O-level or more (d)	0.206**	-0.023*
O-level or more* over 54 years (d)	-0.079**	0.011
First partnership		
Age <25	0.069*	-0.019*
Age >25	-0.026	0.002
Number of previous partners	0.016	-0.005
Number of observations	13,920	6,315

Notes: (d) = dummy variable (1/0); * significant at 5% level; ** significant at 1% level.

Base groups: less than O-level or no qualifications.

Controls also included: age, marital status, local unemployment rate and time trend.

Age of last partnership dissolution

Table B.18 Associations of last partnership dissolution with employment and exits from employment for men aged 50-70 (BHPS)

	Employed or not (1)	Exits from employment (2)
O-level or more (d)	0.108**	-0.002
O-level or more* over 59 years (d)	-0.043	0.005
First partnership		
Age <25	0.084*	-0.016*
Age >25	-0.011	0.004
Age at last partnership dissolution	0.006	-0.001
Number of observations	10,698	6,449

Notes: (d) = dummy variable (1/0); * significant at 5% level; ** significant at 1% level.

Base groups: less than O-level or no qualifications.

Controls also included: parental social class, age, marital status, local unemployment rate and time trend.

Table B.19 Associations of last partnership dissolution with employment and exits from employment for women aged 50-70 (BHPS)

	Employed or not (1)	Exits from employment (2)
O-level or more (d)	0.207**	-0.023*
O-level or more* over 54 years (d)	-0.080**	0.011
First partnership		
Age <25	0.064*	-0.017*
Age >25	-0.026	0.002
Age at last partnership dissolution	0.002	0.000
Number of observations	13,931	6,316

Notes: (d) = dummy variable (1/0); * significant at 5% level; ** significant at 1% level.

Base groups: less than O-level or no qualifications.

Controls also included: age, marital status, local unemployment rate and time trend.

Appendix C
Additional LS estimates

Number of children

Table C.1 Associations of highest number of children in 1971-2001 Censuses with employment in 2001 and exits from employment 1991-2001, for men aged 50-70 in 2001 (LS)

	Employed or not 2001 (1)	Exits from employment 1991-2001 (2)
Age 50-55	-0.128**	0.137**
Age 55-60	-0.188**	0.194**
Age 60-65	-0.262**	0.254**
Age 65-70	-0.170**	0.141**
State Pension age (d)	-0.201**	0.202**
Separated/divorced (d)	-0.131**	0.072**
Widowed (d)	-0.139**	0.111**
Never married (d)	-0.168**	0.075**
Degree (d)	0.119**	-0.054**
A-level (d)	0.094**	-0.046**
O-level (d)	0.120**	-0.073**
Less than O-level (d)	0.095**	-0.046**
Degree* over 59 years (d)	-0.071**	0.038**
A-level* over 59 years (d)	-0.061**	0.012
O-level* over 59 years (d)	-0.052	0.023*
Less than O-level* over 59 years (d)	0.001**	-0.019

Continued

Table C.1 Continued

	Employed or not 2001 (1)	Exits from employment 1991-2001 (2)
Age had first child		
Age <25	0.069**	-0.052**
Age >25	0.021**	-0.024**
No children (d)	-0.049**	0.040**
Two children (d)	0.044**	-0.032**
Three children (d)	0.039**	-0.043**
Four children (d)	0.015	-0.034**
Five children (d)	-0.051**	-0.025
Six or more children (d)	-0.067**	-0.041
Number of observations	46,423	39,202

Notes: (d) = dummy variable (1/0); * significant at 5% level; ** significant at 1% level.

Base groups: married/cohabiting; no qualifications; 1 child.

Source: Office for National Statistics Longitudinal Study (ONS LS). Authors' analysis.

Table C.2 Associations of highest number of children in 1971-2001 Censuses with employment in 2001 and exits from employment 1991-2001, for women aged 50-70 in 2001 (LS)

	Employed or not 2001 (1)	Exits from employment 1991-2001 (2)
Age 50-55	-0.063**	0.091**
Age 55-60	-0.160**	0.199**
Age 60-65	-0.283**	0.296**
Age 65-70	-0.270**	0.251**
State Pension age (d)	-0.097**	0.125**
Separated/divorced (d)	0.015**	-0.048**
Widowed (d)	-0.030**	0.007
Never married (d)	-0.036**	-0.003
Degree (d)	0.242**	-0.152**
A-level (d)	0.208**	-0.150**
O-level (d)	0.159**	-0.104**
Less than O-level (d)	0.158**	-0.113**
Degree* over 54 years (d)	-0.139**	0.129**
A-level* over 54 years (d)	-0.049*	0.036
O-level* over 54 years (d)	-0.065**	0.050**
Less than O-level* over 54 years (d)	-0.051**	0.041**

Continued

Table C.2 Continued

	Employed or not 2001 (1)	Exits from employment 1991-2001 (2)
Age had first child		
Age <25	0.042**	-0.046**
Age >25	0.018**	-0.046**
No children (d)	-0.111**	0.070**
Two children (d)	0.076**	-0.064**
Three children (d)	0.092**	-0.072**
Four children (d)	0.092**	-0.068**
Five children (d)	0.053**	-0.025
Six or more children (d)	0.055	-0.048
Previously employed (0-3)	0.137**	-0.034**
Previously unemployed (0-3)	0.019*	-0.003
Previously sick/disabled (0-3)	-0.335**	0.279*
Number of observations	49,999	32,789

Notes: (d) = dummy variable (1/0); * significant at 5% level; ** significant at 1% level.
Base groups: married/cohabiting; no qualifications; 1 child.

Source: ONS LS. Authors' analysis.

Employment history

Table C.3 Associations of employment/unemployment/sickness experiences in 1971-2001 Censuses with employment in 2001 and exits from employment 1991-2001, for men aged 50-70 in 2001 (LS)

	Employed or not 2001 (1)	Exits from employment 1991-2001 (2)
Age 50-55	-0.153**	0.136**
Age 55-60	-0.201**	0.199**
Age 60-65	-0.269**	0.257**
Age 65-70	-0.152**	0.141**
State pension age (d)	-0.203**	0.201**
Separated/divorced (d)	-0.085**	0.066**
Widowed (d)	-0.115**	0.108**
Never married (d)	-0.085**	0.072**
Degree (d)	0.096**	-0.044**
A-level (d)	0.050**	-0.039*
O-level (d)	0.085**	-0.069**
Less than O-level (d)	0.052**	-0.041**
Degree* over 59 years (d)	-0.074**	0.030
A-level* over 59 years (d)	-0.032	0.007
O-level* over 59 years (d)	-0.037**	0.022
Less than O-level* over 59 years (d)	0.019	-0.022
Age had first child		
Age <25	0.046**	-0.048**
Age >25	0.026**	-0.025**
No children (d)	-0.031*	0.038**
Two children (d)	0.037**	-0.031**
Three children (d)	0.046**	-0.043**
Four children (d)	0.046**	-0.038**
Five children (d)	0.024	-0.034
Six or more children (d)	0.031	-0.052
Previously employed (0-3)	0.168**	0.029
Previously unemployed (0-3)	-0.014	0.129**
Previously sick/disabled (0-3)	-0.400**	0.194**
Number of observations	46,423	39,202

Notes: (d) = dummy variable (1/0); * significant at 5% level; ** significant at 1% level.

Base groups: married/cohabiting; no qualifications; 1 child.

Source: ONS LS Authors' analysis.

Table C.4 Associations of employment/unemployment/sickness experiences in 1971-2001 Censuses with employment in 2001 and exits from employment 1991-2001, for women aged 50-70 in 2001 (LS)

	Employed or not 2001 (1)	Exits from employment 1991-2001 (2)
Age 50-55	-0.068**	0.093**
Age 55-60	-0.181**	0.204**
Age 60-65	-0.305**	0.302**
Age 65-70	-0.242**	0.253**
State pension age (d)	-0.100**	0.125**
Separated/divorced (d)	0.040**	-0.050**
Widowed (d)	-0.017*	0.007
Never married (d)	0.005	-0.002
Degree (d)	0.184**	-0.147**
A-level (d)	0.153**	-0.143**
O-level (d)	0.110**	-0.099**
Less than O-level (d)	0.110**	-0.107**
Degree* over 54 years (d)	-0.133**	0.129**
A-level* over 54 years (d)	-0.009	0.029
O-level* over 54 years (d)	-0.043**	0.045**
Less than O-level* over 54 years (d)	-0.025	0.036
Age had first child		
Age <25	0.047**	-0.049**
Age >25	0.019**	-0.046**
No children (d)	-0.111**	0.070**
Two children (d)	0.076**	-0.064**
Three children (d)	0.092**	-0.072**
Four children (d)	0.092**	-0.068**
Five children (d)	0.053**	-0.025
Six or more children (d)	0.055	-0.048
Previously employed (0-3)	0.137**	-0.034**
Previously unemployed (0-3)	0.019*	-0.003
Previously sick/disabled (0-3)	-0.335**	0.279*
Number of observations	49,999	32,789

Notes: (d) = dummy variable (1/0); * significant at 5% level; ** significant at 1% level.

Base groups: married/cohabiting; no qualifications; 1 child.

Source: ONS LS. Authors' analysis.

Appendix D
Three job strains

Measuring job strains

WERS 2004 has, altogether, nine questions or sets of questions about the employee's job out of which three include job characteristics/strains that can be generalised towards occupations rather than workplaces (e.g. how are employment relations organised at this place of work?) or individuals (e.g. how does the job fit individual skills/preferences?).

Job stress was first measured as an additive index of two items: *'Do you agree or disagree with the following statements about your job? (1) My job requires that I work very hard. (2) I never seem to have enough time to get my work done.'* Five responses varied from 'strongly agree' to 'strongly disagree' plus 'don't know' (set to missing).

Job autonomy was first measured as a simple additive index of four items: *'In general how much influence do you have over the following: (1) the tasks you do in your job, (2) the pace at which you work, (3) how you do your work, (4) the order at which you carry out tasks.'*

Job satisfaction was first measured as an additive index of two items: *'How satisfied are you with the following aspects of your job? (1) The sense of achievement you get from your work; (2) the work itself.'* Five responses varied from 'very satisfied' to 'very dissatisfied' plus 'don't know' (set to missing).

Limiting influential occupations

Unfortunately, when these indices were imputed into occupational job strains in the BHPS the job strains variables had some very deviant observations: standardised scores varied by as much as nine standard deviations for job stress, 13 standard deviations for job autonomy and ten standard deviations for job satisfaction when comparing the lowest and highest scores. One consequence was that the

results were likely to be dominated by only a few occupations, meaning that the prospects of generalising the results across occupations are low. Thus, this variable was transformed using a square root transformation (from the mean, restoring negative values later on) which makes the most deviating occupations less influential while expanding differences closer to the mean in a relative sense. Also the transformed variable was standardised (mean=0 and standard deviation=1). Luckily, results are very similar for the three transformed and the non-transformed job strain variables. But the transformed variables give us the confidence that these results do not result from a few odd/deviant occupations.

Linking occupational codes

The BHPS uses the Standard Occupational Classification (SOC)1990 classification whereas the WERS 2004 uses the SOC2000 classification. In spite of seemingly similarities in labels the two classifications are actually very different. The three digit SOC1990 corresponds to the four digit SOC2000. The documentation (Volume 2) of the 2000 classification (ONS 2000) presents a list of nearly 2,200 occupational titles with both the SOC1990 and SOC2000 codes. From this list there are 375 unique combinations of the two coding schemes, including 270 unique SOC1990 (three digit) codes and 249 unique SOC2000 (four digit) codes. A joint data file (of 375 records) was made on the basis of this information. Then, the three job strains (job stress, job autonomy, job satisfaction) from WERS 2004 were imputed into this joint data file. Since the SOC1990 codes do not always correspond to the unique SOC2000 codes, the average job characteristic of the SOC2000 codes were imputed into each SOC1990 code using the number of people contributing with job characteristics in the WERS 2004 for each SOC2000 code as weighting variable. From this procedure, job characteristics were ascribed to 261 of the 270 SOC1990 codes. In cases where no estimates could be obtained using this procedure (no data available at this level from WERS 2004) a similar procedure was done using the first two digits of the SOC1990 codes in combination with the first three digits of the SOC2000 codes.

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