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Residential mobility, neighbourhood quality and life-course events

Birgitta Rabe
Mark Taylor
Institute for Social and Economic Research
University of Essex

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Non-technical summary

Life-course events like having a baby, losing a job, or forming or dissolving a partnership are often associated with moving house. Many studies have analysed how households adjust the size, tenure, type and quality of housing at such different life stages. However little is known about the effect that life-course events have on moving into 'better' or 'worse' neighbourhoods. This is astonishing given that research suggests that neighbourhood characteristics influence important outcomes such as life satisfaction, health, and labour market experiences.

In this paper we focus on the relationship between life-course events, residential mobility and neighbourhood quality. Using data from the British Household Panel Survey, we analyse which life-course events entice households to move house, and what role the quality of the neighbourhood has in this decision. Furthermore we look at the changes in neighbourhood quality of those who move and investigate which life-course events are associated with moves into better and with moves into worse neighbourhoods. The dimensions of neighbourhood quality adjustment we examine include both a subjective measure, liking or not liking the neighbourhood, and objective measures as assessed by the Indices of Multiple Deprivation.

We find that for singles and couples, many life-course events such as taking up a new job, partnership break-up, a child leaving home and leaving the parental home are associated with moving house. Not liking the neighbourhood is also an important factor in this decision. Among the objective measures of neighbourhood deprivation, crime and the quality of the local environment both within and beyond the home are most important. In contrast, most of the life-course events that we consider have no statistically significant association with moving into more or less deprived neighbourhoods. Ceasing to live with parents, entering work or having a child leave home are associated with single people moving into more deprived neighbourhoods. The only life-course event that seems to seriously affect couples is the husband becoming unemployed, which leads to moves into more deprived areas, whereas having a new baby is associated with improved neighbourhood quality outcomes.

Residential mobility, neighbourhood quality and life-course events

Birgitta Rabe

and

Mark Taylor

Institute for Social and Economic Research
University of Essex
Colchester
Essex, C04 3SQ
UK
Email: brabe@essex.ac.uk

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Abstract: Neighbourhood characteristics affect the social and economic opportunities of their residents. While a number of studies have analysed housing adjustments at different life stages, little is known about neighbourhood quality adjustments, or movements into 'better' or 'worse' neighbourhoods. Based on a model of optimal housing consumption we analyse the determinants of residential mobility and the associated neighbourhood quality adjustments, drawing on data from the British Household Panel Survey and Indices of Multiple Deprivation. We measure neighbourhood quality both subjectively and objectively and find that not all life-course events that are associated with moves lead to neighbourhood quality adjustments. Single people are negatively affected when ceasing to live with parents and couples by a husband's unemployment. Couples having a new baby move into better neighbourhoods.

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1. Introduction

Life-course events like having a baby, losing a job, or forming or dissolving a partnership are often associated with residential mobility. The housing needs and consumption opportunities of a household change due to changes in its circumstances (Kan 1999) and numerous studies have analysed housing adjustments at different life stages. For example, there is a large literature looking at the consequences of partnership dissolution for the type, tenure and quality of housing (e.g. Poortman 2000; Feijten 2005; Aassve et al. 2006), and studies on housing adjustments related to retirement (e.g. Ermisch and Jenkins 1999) and unemployment (e.g. Ermisch and Di Salvo 1996). In contrast, little is known about the effect that life-course events have on neighbourhood quality adjustments, i.e. moving into 'better' or 'worse' neighbourhoods. This is astonishing, given that research suggests that neighbourhood features affect important outcomes such as life satisfaction, health, and labour market experiences (e.g. Buck 2001; van der Klaauw and van Ours 2003; Ioannides and Zabel 2003). In this paper we focus on the relationship between life-course events, residential mobility and neighbourhood quality, drawing on data from the British Household Panel Survey (Taylor et al. 2009) and Indices of Multiple Deprivation (Noble et al. 2006). The dimensions of neighbourhood quality adjustment we examine include both a subjective measure, liking or not liking the neighbourhood, and objective measures as assessed by the Indices of Multiple Deprivation.

The classic view indicates that residential mobility is prompted by the unsuitability of current housing, with the desire for more space, change in home ownership status, and for cheaper dwellings explaining relocation behaviour (Rossi 1955). Residential mobility has been linked in the literature to a range of life-course events, including demographic and employment-related events. The former include changes in family composition such as divorce, childbirth or children leaving the parental home which may alter preferences for housing attributes including housing type and neighbourhood quality (Clark and Onaka 1983; Dieleman and Schouw 1989; Mulder and Hooimeijer 1999). For instance, when the household enters the childbearing and childrearing stages of the life-course, both the current neighbourhood and the current housing unit may be judged on new standards (Lee et al. 1994). There is a substantial literature that examines the complex relationships between job and employment status changes and residential mobility. Much geographical mobility is associated at least

partly with employment-related reasons, including retirement, and within the family context this can create 'tied movers', i.e. spouses who are adversely affected by the move in terms of their own employment and earnings (Bartel 1979; Bailey and Cooke 1998; Boyle et al 2003; Clark and Davies Withers 2007).

The neighbourhood as well as the dwelling can be a source of dissatisfaction with the current location (van Ham and Feijten 2008). However studies which incorporate the neighbourhood context into the analysis of residential mobility have mixed results. Some suggest that although many individuals express dissatisfaction with their local area, neighbourhood characteristics explain a relatively small proportion of actual mobility (e.g. Newman and Duncan 1979; Clark and Onaka 1983; Böheim and Taylor 2002; Kearns and Parkes 2005; Clark and Ledwith 2006). Other papers do find effects for neighbourhood characteristics such as neighbourhood deterioration, adequacy of services, safety and accessibility, and the overall assessment of the neighbourhood (Boehm and Ihlanfeldt 1986; Clark and Huang 2003). The quality of the neighbourhood has also been found to be an important motivation for moving out of distressed neighbourhoods, particularly in terms of an environment for bringing up children, deficiency in law and order, and poverty (Shefer and Primo 1985; Skogan 1990; South and Crowder 1997).

While there has been substantial interest in studying the reasons for moving house and the role of neighbourhoods in this, neighbourhoods have been studied much less as an outcome (Clark et al. 2006 are an exception). The general consensus from the existing literature is that the young, the highly educated, those in high level occupations, private tenants and higher income households have the highest mobility propensities (Böheim and Taylor 2002; Clark and Dieleman 1996; Bailey and Livingston 2008), and it is assumed that these individuals choose to live in 'good' neighbourhoods. Clark et al. (2006) also concentrate on improvements in neighbourhood quality and show that they often accompany housing improvements. This could be because better houses are concentrated in better neighbourhoods. But neighbourhood improvements also occur independently of any changes in housing size or tenure, thus indicating that neighbourhoods motivate households in their own right. In this paper we take account of the fact that life-course events can trigger moves into favourable as well as into non-favourable environments, depending on the nature of the events.

An important distinction to make is between objective and subjective measures of neighbourhood quality. Most of the literature relies on survey data which collects subjective perceptions of different aspects of neighbourhoods, and linking in objective measures is not always possible. Although it is clear that perceptions of area quality may be just as important as objective indicators (Logan and Collver 1983), little is known about the relationship between the two, and in particular which objective aspects of a neighbourhood are relevant to individuals' perceptions of their living environment. This paper will explore the relationship between objective and subjective measures of neighbourhood quality by merging the English Indices of Multiple Deprivation into the British Household Panel Survey.

Our work contributes to the existing literature in a number of ways. To the best of our knowledge this is the first paper looking at the effects of life-course events on moving into neighbourhoods of different quality, which we refer to as 'neighbourhood quality adjustments'. We adopt a dynamic perspective, focusing on life-course events which potentially change an individual's or household's housing needs as well as their assessment of the suitability of the neighbourhood. Moreover, by combining area-based measures of deprivation with panel data, we are able to use both objective and subjective measures of neighbourhood quality in our analysis and to explore the relationship between the two. We find that (i) both subjective and objective neighbourhood quality are determinants of couples' mobility behaviour, but subjective aspects are more important. Singles are affected by subjective neighbourhood quality only; (ii) not all life-course events associated with mobility lead to neighbourhood quality adjustments; (iii) couples move into worse neighbourhoods when a husband experiences unemployment and into better ones when they have a new baby, whereas singles are most affected when ceasing to live with parents; (iv) moving into better (worse) houses in terms of tenure and/or size is associated with moving into better (worse) neighbourhoods.

2. Theoretical background and methods

To provide a structure for the empirical analysis we model households' mobility decisions as reactions to desired changes in the type, location and/or cost of the current accommodation, which we call a household's 'housing consumption'. This is

comprised of a vector of housing characteristics (H_t) such as housing tenure, the number of rooms, cost, etc., and a vector of neighbourhood quality characteristics (N_t). The maximum level of satisfaction that can be obtained from housing consumption, h_t*, is a function of these housing and neighbourhood quality characteristics, together with characteristics that describe a household's needs in period *t*, which can be expressed as:

$$h_t^* = h(D_t, H_t, N_t, u_t) \tag{1}$$

where D_t is a vector of demographic and employment-related characteristics of the household such as age of household members, the number of children, partnership status, employment status, etc., and u_t is an unobserved random variable that represents household-specific tastes for housing not captured in the observable characteristics. Equilibrium is reached when current housing needs are met, i.e. when a household maximises its relative satisfaction from housing consumption and the consumption of non-housing goods within the constraints of what it can afford (e.g. Boehm and Ihlanfeldt 1986).

If any of the components determining housing consumption changes, because of partnership or family formation for example, or because of changes in neighbourhood quality characteristics or requirements, then the level of satisfaction derived from housing consumption also changes. This will prompt residential mobility if it is anticipated that a higher level of satisfaction can be achieved in a different dwelling or location. Given this, the probability of a residential move between time *t*–1 and *t*, $P(M_{t-1,t})$, can be written as a function *k* of moving costs (C_t) and the disequilibrium between satisfaction from housing consumption at *t*–1 (h_{t-1}) and that anticipated for time *t* (h_t*):

$$P(M_{t-1,t}) = k(h_t^* - h_{t-1}, C_t) \tag{2}$$

Therefore mobility in this model might take place when h_t* is sufficiently larger than h_{t-1} to offset the associated moving costs. This may occur when households wish to change their total spending on housing or wish to change their housing consumption

through housing tenure, size, or neighbourhood. Mobility then is a response to changes in household characteristics, housing requirements, or changes in neighbourhood quality characteristics or requirements.

In this model moving into a better or worse neighbourhood can occur directly as an intended outcome of the mobility process, such as a desire to locate to a better neighbourhood. It can also be the result of a trade-off between the constituent components of the household's housing consumption, for example moving to a lower quality neighbourhood in order to be able to afford a larger house.

Although we cannot observe the actual gain from residential mobility, it is clear that households will only choose to move if the benefits outweigh the moving costs both in financial and psychological terms. The housing and neighbourhood adjustment process will comprise two parts, (1) changes in overall housing consumption through mobility, and (2) changes in housing and neighbourhood characteristics as part of the move. As we are particularly interested in neighbourhood quality adjustments, we focus on the neighbourhood changes in the second part of the adjustment process, controlling for housing adjustments.

The empirical counterpart to the simple model comprises regression models which capture the adjustment as a sequential process:

(1) the propensity to make a residential move between time *t*-1 and time *t*, and
(2) the extent and direction of neighbourhood quality adjustment conditional on making a residential move.

An alternative to this sequential approach is to model residential mobility and the associated neighbourhood quality adjustments simultaneously, which would yield more efficient parameter estimates. However, as well known from standard econometric methodology, this presents a problem known as identification which can only be resolved by finding 'instrumental variables' that determine the probability of moving home but not neighbourhood quality adjustment conditional on moving. The lack of any such suitable instrumental variable in our data leads us to follow the sequential approach. We use several measures of neighbourhood quality adjustment, namely the subjective measure of moving into and out of neighbourhoods which

individuals like, and the objective measures of moving into more or less deprived neighbourhoods as assessed by the Index of Multiple Deprivation and its sub-indices.

We define $M^*_{t-1,t}$ to be an unobserved continuous latent variable which identifies housing consumption disequilibrium via an index of the *propensity to make a residential move* between year *t*–1 and *t*. According to the life-course perspective we adopt, this is assumed to be influenced by specific 'shocks' in the interval between those years. A residential move takes place when $M^*_{t-1,t}$ is greater than a threshold of an arbitrary origin of zero on the latent continuum. Below we discuss the use of logit models for the probability of the move, $P(M^*_{t-1,t}>0)$, where $M^*_{t-1,t}$ is modelled by:

$$M^*_{t-1,t} = \alpha_o + \alpha_1 D_{t-1,t} + \alpha_2 H_{t-1} + \alpha_3 N_{t-1} + u_t \qquad (3)$$

Here $D_{t-1,t}$ captures changes in individual and household demographic and employment-related characteristics between *t*–1 and *t*. We refer to these changes as life-course events. H_{t-1} are housing characteristics prior to any move, N_{t-1} is neighbourhood quality prior to any move and u_t is random error. Each of the life-course events is expected to increase the chances of residential mobility by providing a shock either to housing and neighbourhood demand, income, or the costs of moving. For example, losing a job will affect the affordability of housing via an income effect, whereas the birth of a child may alter the housing needs and the evaluation of the current neighbourhood, and losing a spouse by death or separation may significantly alter both moving costs and income. The life-course events we look at include employment-related events such as entering work, unemployment, inactivity or retirement and changing job and/or employer. Demographic events include a birth in the family, a child approaching school age, and an adult child leaving the family home. For singles we also consider whether they have experienced partnership dissolution (by separation, divorce or death of partner) and whether they cease to live with their parents. For couples, we look at employment-related events of both spouses.

We treat life-course events as exogenous. If instead there is residual correlation between mobility and such events due to unobserved factors which influence both, our

results could be biased. We would expect such endogeneity to be an issue when (1) there are fixed person-specific attributes that affect both the life-course events and mobility or (2) there is anticipation, for example a couple moves in anticipation of planned fertility. Research has suggested both for mobility and fertility choices, for example (e.g. Kulu 2008), but there is little research on the expected direction of a possible bias. We would assume that individuals who are prone to experience job-related events are also more likely to move, for example because they are happy to take risks. In this case our results would be biased upwards. We have no means of identifying this as we do not observe enough multiple moves in our data to exploit variation within individuals in life-course events and mobility. Furthermore, and as discussed earlier, there are also no variables available that are correlated with the life-course events but that have no independent or direct effect on mobility which we could use as instruments.

In addition to life-course events, we capture differences across households using variables measuring housing characteristics at *t*–1 prior to any move (H_{t-1}), including home ownership or tenure status and the number of 'excess' rooms, which is defined as the number of rooms in a dwelling minus the number of individuals living in the dwelling. N_{t-1} includes variables measuring neighbourhood quality, which are of central interest in this paper.

We might suppose without any loss of generality that a residential move occurs when $M^{*}_{t-1,t}$ is positive and therefore estimate a logit model specification for the probabilities of the observed mobility behaviour. However, because we have repeated observations on the same individuals over time, we also allow for time-invariant unobserved effects that may be correlated with both residential mobility and observable characteristics. We do this by decomposing the error terms u_t as:

$$u_t = \varepsilon + v_t \tag{4}$$

where ε denotes the individual-specific unobservable effects and v_t is random error. We treat ε as random and normally distributed and use the random effects logit

model estimated under the standard assumption that v_t are independent and follow a standard logistic distribution with mean zero and variance $\sigma_v^2 = \pi^2/3$. With $M^*_{t-1,t}$ as in (3) and these assumptions about ε and v_t as components of u_t, if we denote $\pi = \Pr\left(M^*_{t-1,t} > 0\right)$ then the model is:

$$\ln\left(\frac{\pi}{1-\pi}\right) = \alpha_o + \alpha_1 D_{t-1,t} + \alpha_2 H_{t-1} + \alpha_3 N_{t-1} + \varepsilon \tag{5}$$

Estimation in this framework assumes that the time invariant unobserved individual-specific effects (ε) are independent of the observable characteristics. This is a quite restrictive assumption if, for example, more motivated and committed individuals are both more likely to get married or find a new job and also more likely to move home. In this case the estimated coefficients of interest (α) will pick up some of the effects of the unobservable ε. To avoid this problem we relax the assumption that the ε are independent of the observed time-varying covariates. Following Chamberlain (1984) and Mundlak (1978), we model the dependence between ε and observed characteristics by assuming that the regression function of ε is linear in the mean values of the time-varying covariates. This can be written as:

$$\varepsilon = a_0 + a_1\overline{D} + a_2\overline{H} + a_3\overline{N} + \mu \tag{6}$$

where μ, the residual unobservable effect, is assumed to be uncorrelated with *D*, *H*, *N* and u_t, a_0 will be incorporated into the overall intercept α_0, and $\overline{D}$, $\overline{H}$ and $\overline{N}$ refer to the vectors of mean values of the subset of the covariates in $D_{t-1,t}$, H_{t-1}, and N_{t-1} that are time-varying. Time-invariant covariates are excluded. Therefore the latent propensity to move becomes:

$$M^*_{t-1,t} = \alpha_o + \alpha_1 D_{t-1,t} + \alpha_2 H_{t-1} + \alpha_3 N_{t-1} + a_1\overline{D} + a_2\overline{H} + a_3\overline{N} + \mu + v_t \tag{7}$$

The parameters of this are estimated from the observed mobility process through the logit model considered above but with additional regressors $\overline{D}$, $\overline{H}$ and $\overline{N}$. As the mobility behaviour of singles is known to be distinct from that of couples (married

and cohabiting) we estimate separate mobility equations for single and couple households. We provide a more detailed discussion of the units of analysis and how they are defined in the data section.

The second part of the analysis focuses on *neighbourhood quality adjustments conditional on a move*. Neighbourhood quality adjustments are now treated as outcomes which are a function of life-course events and housing adjustments. The effect of these can only be analysed by using information on movers. Housing adjustments may result in neighbourhood quality changes, for example because higher quality housing is likely to be situated in 'better' neighbourhoods. The coefficients on the life-course events will measure their effect on neighbourhood quality holding constant changes in housing quality. We focus on changes in the quality of the neighbourhood in which a household lived at time t–1 compared to the quality of the neighbourhood of residence at time t. We use two measures of neighbourhood quality adjustments between the destination and origin location. The first examines the change in deprivation score of the lower layer super output area of residence between year t–1 and t, defined as:

$$n_{t-1,t} = n_t - n_{t-1} \tag{8}$$

Where n is an element of the vector $N = n_1,\ldots,n_8$, which consist of the Index of Multiple Deprivation and its seven domain indices described in more detail in the data section. These are our objective measures of neighbourhood quality. Super output areas are a statistical geography defined for the collection and publication of small area statistics. There are 32,482 lower layer super output areas (LSOAs) in England which were constructed using measures of proximity (to give a reasonably compact shape) and social homogeneity (type of dwelling and type of tenure, to encourage areas of similar social background). Each LSOA has constant boundaries and a mean population of 1,500 and a minimum of 1,000 individuals. Although LSOAs are far from being a perfect definition of a neighbourhood, they do allow more meaningful fine-grained area analysis at the local level than the more heterogeneous Census tracts or wards.

To investigate the extent to which life-course events are associated with these objective neighbourhood quality adjustments, we estimate the following using Ordinary Least Squares (OLS):

$$n_{t-1,t} = \beta_0 + \beta_1 D_{t-1,t} + \beta_2 H_{t-1,t} + w_t \quad (9)$$

where $D_{t-1,t}$ again captures life-course events, and $H_{t-1,t}$ captures adjustments in housing between *t*–1 and *t*. To define changes in the quality of housing tenure we assume a tenure hierarchy on an ordinal scale: (1) social renting; (2) private renting; (3) owning with a mortgage; (4) owning outright. Households moving up (down) one or more places in this scale are defined as moving into 'better' ('worse') housing tenure (Clark et al. 2006, p. 333, use a similar procedure). As we have repeated observations on the same individuals over time, it is possible to again allow for unobserved individual-specific effects using panel data models. However, to do this requires individuals with repeated moves within the period, and there are too few individuals who move more than once to make this feasible. Instead we adjust standard errors for clustering (repeated observations for singles and couples respectively, Wooldridge 2002).

Our second measure of neighbourhood quality is subjective and captures changes in whether an individual likes his/her neighbourhood before and after a move between *t*–1 and *t*. In particular we relate whether or not an individual likes their current neighbourhood at time *t*–1 (pre-move) to whether or not they like their current neighbourhood at time *t* (post-move) by creating a variable ($L_{t-1,t}$) that takes the following values:

1 if the individual likes the current neighbourhood both at *t*–1 and *t*;
2 if the individual does not like the current neighbourhood at *t*–1 but likes it at *t*;
3 if the individual likes the current neighbourhood at *t*–1 but does not like it at *t*;
4 if the individual does not like the current neighbourhood at both *t*–1 and *t*.

Here our dependent variable is unordered and categorical and we specify the category probabilities as a function of contemporaneous life-cycle events and changes in

housing characteristics by a multinomial logit model. Letting π_{Li} = Prob($L_{t-1,t}$=i), i = 1, 2, 3, 4, this specifies

$$\ln\left(\frac{\pi_{L_i}}{\pi_{L_1}}\right) = \gamma_{0i} + \gamma_{1i} D_{t-1,t} + \gamma_{2i} H_{t-1,t} \quad \text{for } i = 2, 3, 4 \tag{10}$$

In this characterisation, category 1, the transition from like to like, acts as the reference category for the odds.

3. Data

3.1. Measures of neighbourhood quality

Our objective data on neighbourhood quality is from the Index of Multiple Deprivation (IMD) 2004 and 2007 (Noble et al. 2006). This is a lower layer super output area (LSOA) index consisting of seven domain indices which capture different aspects of deprivation within a super output area, relating to income, employment, health and disability, education, skills and training, barriers to housing and geographical access to services as well as crime and living environment. Most indices refer to social characteristics of the LSOA, but indicators relating to physical characteristics are used in the barriers to housing and services index (e.g. road distance to a post office) and the living environment index (e.g. condition of housing and air quality). The domain indicators use up-to-date information from 37 indicators to describe deprivation at the LSOA level. Although called the IMD 2004 and 2007, most indicators used to measure deprivation relate to 2001 and 2005 respectively. Note that these are cross-sectional indices, relating to LSOA level deprivation at a particular point in time.

As well as the seven domain specific indices, there is an overall LSOA level index which is a weighted combination of the domain indices. The income and employment domain indices carry more weight than others, both because they are the most robust indicators of deprivation and because academic literature indicates that these are the domains most likely to contribute to deprivation. As well as each LSOA having an absolute score for each index, it has also been assigned a national rank which may differ for each index used. The most deprived LSOA for each index is ranked 1 and

the least deprived LSOA is ranked 32,482. The scores use different domain-specific units of measurement and a high score indicates a high level of deprivation. The ranks and scores show how each LSOA compares to all others in the country.

The subjective measure of neighbourhood quality we use is the response to the question, "Overall, do you like living in this neighbourhood?" from the British Household Panel Survey (BHPS) which we describe in more detail below. It is important to note that subjective measures may be subject to measurement error and ex-post rationalisation. They may capture characteristics of the neighbourhood itself but can also be influenced by positive or negative feelings following a life cycle event. In addition, the answer category is binary and as such does not capture a scale of liking or not liking the neighbourhood. Despite these shortcomings, which are commonly encountered in subjective assessments, empirically they are useful in explaining differences in behaviour (Bertrand and Mullainathan 2001). One of the aims of the paper is to compare the extent to which subjective and objective criteria coincide. Empirically, the liking (or not) of neighbourhoods is fairly constant within individuals over successive waves of the BHPS, with only 9.5% of singles, 6% of husbands and 8% of wives that stay in the same residence changing their status. Among movers, 23% of singles change their status when they move, either by moving from a neighbourhood they did not like into one that they like or vice versa. For husbands in moving couples the proportion that change their status is 21% and for wives 38%.

3.2. Survey data

Our aim in this paper is to relate residential mobility between more and less deprived neighbourhoods to life-course events. Micro-level panel data are required in order to accurately identify both residentially mobile individuals and households, and the life-course events they experience. Our analysis uses waves nine to sixteen of the British Household Panel Survey (BHPS), covering the period 1999–2006. We link data from the years 1999–2002 to the IMD 2004 and data from the years 2003–2006 to the IMD 2007, as these relate to the years closest to when the indicators used to measure deprivation in the IMD were assessed. We do not use BHPS data prior to 1999 as we

cannot assume neighbourhood quality or deprivation to be constant over the medium term and therefore focus only on BHPS data close to the years for which IMD indices are available.

The BHPS is a nationally representative sample of some 5,500 private households recruited in 1991, containing approximately 10,000 adults. These same adults are interviewed each successive year. If anyone splits from their original household to form a new household, then all adult members of the new household are also interviewed. Children in original households are interviewed when they reach the age of 16. The core questionnaire elicits information on income and earnings, labour market status, housing tenure and conditions, household composition, education and health at each annual interview.

As part of maintaining the panel sample, information is collected on the migration behaviour of BHPS respondents, identifying those that move house and attempting to follow all migrants who remain in Britain. Attrition rates among migrants are higher than among non-migrants (Buck 2000) and if the selection into the sample of individuals observed at two consecutive times (i.e. at wave t–1 and at wave t) is non-random this could bias our results. We have investigated this, and found that we cannot reject the null hypothesis that residential mobility is independent of attrition. Therefore we conclude that attrition does not affect our results. Details of the procedure used are available from the authors on request.

The set of observations in our analysis samples are household-years, i.e. households observed over a period between two points t–1 and t across adjacent years from 1999–2006. For each year t–1 we extract from the data samples of singles and couples (married or cohabiting) and trace them through to time t. The singles sample include those observations where the household was a single one at both t–1 and t but also those on single individuals at t who had left a partner since t–1, either through separation, divorce or death of partner. The couples sample is for those of intact couples over t–1 to t. The samples exclude the situation of a newly formed couple at time t, including those from single BHPS households at time t–1, because information

for wave *t*–1 is not available for a spouse who joined an existing BHPS household. The same households may appear in several of the household-year observations but are included only if they are interviewed for the relevant consecutive years. Thus some households who drop out may re-enter if they are later interviewed over two consecutive years. Within this sampling frame, it is possible for the same individual to appear in both the couples and singles sample at different years, but only 5% of individuals do so. We refer to the members of a couple as husbands and wives even if they are not married. For couples, we merge the characteristics of the wife to those of the husband to assess the impacts of each separately, though we treat couple-years as the unit of analysis in analysing movement.

To be able to identify objective neighbourhood quality adjustments of movers, residential mobility is defined as moving from one LSOA to another between two consecutive annual interviews. Recent research has suggested that moves of both long and short distance are at least partially motivated by housing adjustment reasons (Clark and Davies Withers 2007). Therefore we impose no distance constraints on our definition of residential mobility. For those who move within LSOA boundaries we have no measure of objective neighbourhood quality change and we therefore delete these observations (159 singles, 146 couples) from our sample. Since the IMD is only available for LSOA in England we select only those living in England at both dates who were aged 18-80. This results in a sample size of 13,777 single person observations and 14,761 couple observations, of which 1,819 single person observations and 1,236 couple observations moved from one LSOA to another. To these we have matched the IMD indices according to their LSOA of residence prior to and after a move. With these data we are able to relate each move and change in neighbourhood quality to the life-course events that individuals and households experienced between the dates of interview.

4. Results

4.1. Descriptive evidence

Table 1 summarises the main characteristics of the singles and couples sets of household-year observations by mover status between *t*–1 and *t*, where life events are also defined between *t*–1 and *t*. In this and the following descriptive tables, we apply weights that adjust for both the probability of selection into the BHPS sample and for

non-random non-response. Most of the differences between movers and stayers are statistically significant beyond the 5% level (see table for details). Looking first at singles, changing job and/or employer and taking up work are the most frequent employment-related events, whereas retirement occurs very rarely. A higher proportion of singles that move change their labour market status than of those who stay in the same LSOA. For example 17% of singles who moved home also entered work (compared with 9% of stayers) and 19.4% changed their job or employer (11.7% of stayers).

The differences between moving and staying single households are also pronounced when it comes to the arrival of a new child (2% compared with 0.5% of stayers) and a child leaving home (5.7% compared with 1.7% of stayers). Most singles that cease to live with their parents move home, while the small number of staying singles could have a change in household composition due to the death or moving out of parent/s. A high proportion of single movers has also experienced partnership dissolution (16.8% compared with 4.1% for stayers), and was living in private rented accommodation at time t–1 (35.6% compared with 7%). The mean overall deprivation score of the LSOA of residence does not differ between moving and staying singles, but a lower proportion of movers reports liking their neighbourhood prior to the move (83.5% compared with 91%).

Among couples, both husbands and wives that move experience labour market events more frequently than those that stay. A larger proportion of husbands that move rather than stay in the same LSOA enter work (6.2% compared with 2.6%), enter unemployment (2.6% compared with 0.9%) and change job or employer (21.6% compared with 11.3%). A similar pattern emerges for women that move. The proportion of couples that have a new baby and whose child reaches school age is higher among the movers (7.1% and 11.8% compared with 3.1% and 7.1% among stayers), but a child leaving home is a more frequent event among stayers (4.1% compared with 2.8%).

Couples resemble singles in that home ownership seems to be associated with staying at a location whereas private renting is associated with mobility (21% of movers were private tenants compared with 3.4% of stayers). The vast majority of husbands and

wives in couples like their neighbourhood although the proportion is higher among stayers than movers and the difference is particularly marked among wives. Almost 93% of wives that did not move reported liking their neighbourhood compared with 68% of those that subsequently moved. Moving couples lived in more deprived LSOAs than staying couples, with a mean overall IMD score of 20.7 prior to the move, compared with 18.5 for stayers.

Table 2 compares households' subjective perceptions of their local neighbourhood with the objective deprivation level as assessed by the overall IMD as well as by the seven domain indices. In particular it compares separately for singles, husbands and wives mean LSOA rankings by domain for individuals that reported liking their current neighbourhood with those of individuals who did not like their current neighbourhood. We use deprivation rankings rather than scores in this and the following table because they allow a direct comparison between the different dimensions of deprivation; the scores use different units of measurement in each domain which makes interpretation and comparisons more difficult. If the objective and subjective measures are consistent, then we expect individuals who did not like their current neighbourhoods to live in more deprived, lower ranked LSOAs.

The descriptive statistics match our expectations – within each domain individuals who liked their current neighbourhood were living in less deprived (higher ranked) LSOAs than those who did not like their neighbourhoods. The difference in rankings is substantial, with singles (husbands, wives) liking their neighbourhoods living in LSOAs ranked around 4000–5000 (6000–7000, 4000–5000) places higher than those not liking their neighbourhoods. For example, singles who liked their neighbourhood lived in LSOAs with an average overall IMD ranking of 15902, compared with 11058 for those that did not like their current neighbourhood. The comparable rankings for husbands (wives) are 18618 (18578) and 11447 (13069). This suggests that (1) the neighbourhoods that singles like are more deprived than those that couples like, and (2) the neighbourhoods that wives dislike are less deprived than those that singles and husbands dislike. In the barriers to housing and services domain the difference in ranking is negligible (around 400). This may reflect the fact that this domain index is likely to assign a low deprivation level to urban areas due to the proximity of many

services, but these areas may well be deprived along other dimensions (Deas et al. 2003).

Table 3 summarises the relationship between objective and subjective neighbourhood quality changes for moving households. It shows the change in deprivation ranking for households who moved from liking the neighbourhood at wave *t*–1 to liking it after a move at wave *t* (column 1); from not liking the neighbourhood to liking it (column 2); and from liking the neighbourhood to not liking it (column 3). We do not include those who reported not liking their neighbourhood both pre- and post-move because of very small cell sizes. In line with expectations the table shows that households that experience a positive subjective transition (from not liking to liking) move into considerably less deprived neighbourhoods, whereas those experiencing a negative transition move into neighbourhoods with higher levels of deprivation. For example singles who reported an improvement in subjective neighbourhood quality after moving were in an LSOA ranked 3429 places higher according to the overall IMD. Those who reported a deterioration in subsequent neighbourhood quality were in a LSOA ranked 2987 places lower according to the overall IMD. Those with a neutral subjective transition experience relatively small changes in deprivation ranking.

Comparing singles with husbands and wives, singles who make a like-like transition move to a neighbourhood ranked around 300–400 places lower than the neighbourhood of origin, whereas husbands and wives making the same transition on average move up in ranking by several hundred places (sometimes thousands). The drop in deprivation ranking associated with a negative subjective neighbourhood transition is similar for singles and husbands in most domains, whereas for wives relatively smaller drops in ranking are associated with a negative subjective transition. However, both singles and husbands who dislike their new neighbourhood experience relatively small drops or even slight increases in ranking as assigned by the living environment domain, and for singles this is also true for the crime domain. This may indicate that these domains have a particular importance for how individuals perceive their neighbourhoods. The barriers to housing and services domain follows a similar pattern, but as before we assume this has to do with deprivation in this domain being relatively low in urban neighbourhoods which may be otherwise deprived.

4.2. Probability of a residential move

We first explore the probability of making a residential move which we estimate separately for singles and couples. Table 4 presents the results from estimating random effects logit models with means of the time varying covariates as additional regressors, where the dependent variable takes the value 1 if a single individual or couple moves, and zero if they do not. These are base models with life course and housing covariates only. Table 5 below will consider extensions by adding in neighbourhood quality. The models are estimated using maximum likelihood, implemented in Stata version 10.0. The figures shown in Table 4 are odds ratios – the exponentiated coefficients which give the change in odds in the multiplicative scale for a unit increase in the predictor variable holding other variables constant. Therefore values of greater than one indicate covariates that increase the chances of moving, while values of less than one indicate covariates that reduce the chances of moving. The z statistics reported in the tables are the ratios of the actual coefficients divided by their estimated standard errors. Note that for both singles and couples, the proportion of the total variance contributed by the household-level variance component or the variance partition coefficient (rho), defined as $\sigma_\mu^2/(\sigma_\mu^2+\pi^2/3)$, is 22% and 17% respectively. Both are quite large and quite precisely estimated, indicating the importance of allowing for unobserved individual heterogeneity within this random effects framework.

Looking first at singles, the table indicates that moving into work is positively associated with residential mobility – holding other covariates constant, entering work increases the odds of moving by 56%. Interactions with housing tenure (not shown) reveal that entering a job is particularly associated with residential mobility for private tenants. Changing job and/or employer and moving into unemployment, inactivity or retirement do not trigger a move in the same year. Having a baby is associated with an increase in the odds of moving from one LSOA to another. The odds for those who have a baby are five times higher than the odds for those who do not have a baby. A child leaving the parental home also increases the chances of residential mobility, by 83%. Ceasing to live with parents has the strongest impact on the probability of moving, increasing the odds by a factor of almost 90 compared to individuals not leaving the parental home. Partnership dissolution also increases mobility

considerably – the odds of moving are almost eight times higher for those that leave a partnership than for those who do not. However, the estimated coefficient on the partnership dissolution and female interaction term is also statistically significant and indicates that women are less likely than men to move as a result of partnership dissolution. The coefficients on the housing characteristics confirm earlier research that living in private rented accommodation is associated with higher mobility than home ownership and social renting. The number of excess rooms has no effect on moving for singles.

The second set of results in Table 4 displays the odds ratios from the random effects logit model of residential mobility for couples. The first set of employment variables in this specification relate to the husband, and we find that most of the husbands' labour market events have a statistically significant effect on the mobility probability (with the exception of entering unemployment). In particular, the odds of moving house are increased by 50% for couples in which the husband enters work, by 99% for couples in which the husband enters economic inactivity and by 32% for couples in which the husband changes his job or employer. In contrast only a wife's retirement is significantly associated with a residential move. Therefore mobility decisions of couples appear to be more sensitive to the labour market position of the husband than the wife. In contrast to singles, having a baby and a child leaving home do not seem to be associated with moving home for couples. The effects of housing tenure on couples' mobility are similar to those for singles in that private renting is associated with an increase in the odds of moving while home ownership reduces the odds of moving. Living in a house with many rooms compared to household size reduces the odds of residential mobility for couples.

In order to capture anticipatory moves and time-delays in mobility following a life-course event, we have also estimated models for singles and couples using leads and lags of life-course events. However, this requires observing households during a number of consecutive waves and thus greatly reduces sample size. With the reduced sample size we were not able to estimate effects precisely and therefore do not reproduce the results here (but these are available from the authors on request).

Table 5 shows the results when successively introducing the measures of neighbourhood quality. Again, the proportion of the total variance contributed by the panel-level variance component (rho) is relatively large and also highly statistically significant, indicating the importance of allowing for unobserved individual heterogeneity within this random effects framework. In model (1) we include the subjective measure of neighbourhood quality and the estimates reveal that liking the neighbourhood deters residential moves for both singles and couples – the associated odds ratios are less than one. In particular, the odds of moving for singles who like their current neighbourhood are just 40% of those for singles who do not like their current neighbourhood. Among couples the size of the effect differs considerably between husbands and wives. The odds of moving for couples in which the wife likes the neighbourhood are just 11% of those for couples in which the wife does not like the neighbourhood. The odds of moving for couples in which the husband likes the neighbourhood are 54% of those for couples in which the husband does not like the neighbourhood. Hence the views of the wife about the current neighbourhood have a larger relative effect than those of the husband on the chances of a couple moving.

In model (2) we include the overall IMD score as the objective measure of neighbourhood quality. The IMD and its sub indices are rescaled to have a minimum value of zero and a maximum value of 100 to make the sizes of the effects comparable across indices. For singles neighbourhood deprivation as assessed by the IMD score has no statistically significant effect on subsequent mobility. For couples, the probability of moving house increases with neighbourhood deprivation. In particular we find that a one unit increase in the IMD score results in a 0.5% increase in the odds of moving. This implies that couples move away from more deprived neighbourhoods, controlling for other life-course events.

In model (3) we investigate further which aspects of deprivation affect households' propensities to move. Because of high collinearity between all the domain indices (except barriers to housing and services) we enter each of the indices into separate equations. The results show that for singles deprivation in the crime and in the living environment domain is associated with higher odds of moving home, although the coefficient on the living environment domain is statistically significant at the 10% level only. A one unit increase in the crime score results in a 0.7% increase in the

odds of moving, while a one unit increase in the living environment score results in a 0.4% increase in the odds. However a one unit increase in the education skills and training deprivation score results in a 0.5% reduction in the odds of moving, and an equivalent increase in the employment domain results in a 0.7% reduction (significant at the 10% level only). The education domain relates to a lack of skills and qualifications among working age adults within a neighbourhood, and residential mobility is known to be less common among those with lower levels of education.

We find that the mobility behaviour of couples is sensitive to similar aspects of deprivation to that of singles. The largest relative effects are found for the living environment and the crime domains – one unit increases in the deprivation score in the crime and in the living environment domains increase the odds of moving by 1%, holding other variables constant. The effect of the health and disability domain is smaller at 0.6%, and the coefficient is significant at the 10% level only.

In model (4) we enter both the subjective measure of neighbourhood quality and the objective measure in the form of the overall IMD score. The estimates for singles suggest that, for them, subjective perceptions of neighbourhood quality matter rather than objective measures. Liking the neighbourhood reduces the odds of subsequent residential mobility (by about 60%), while the overall IMD score has no additional effect. Likewise for couples, only the subjective measures of neighbourhood quality are statistically significant when entered together with the IMD score. However both were statistically significant when entered separately. This suggests that, for couples, the subjective and objective quality indicators in part capture similar aspects of the neighbourhood, and the subjective assessment is more important. Therefore whether or not people like the neighbourhood in which they live is more important than objective measures of neighbourhood quality in explaining mobility. This might suggest either that there are aspects of neighbourhoods that contribute to people's subjective evaluation of neighbourhood quality that are not captured by more objective measures, or that people's interpretation of their neighbourhood bears little overlap with LSOA boundaries.

4.3. Neighbourhood quality adjustments

The second set of results relates to neighbourhood quality adjustments of households conditional on a move. Table 6 presents the results from OLS estimation where the dependent variable is the change in deprivation score for singles that moved house between wave *t*–1 and wave *t*. When analysing changes in scores, it is possible that the limited possibilities for a downward (upward) move for households living in the most (least) deprived wards affect the overall results. Tests based on running the analysis on a sub-sample that excluded the 10% most and least deprived LSOAs yielded unchanged results, implying that this problem did not bias results. Similar results were also obtained using rankings rather than scores, and using ordered categories of moving up or down LSOA rankings. The coefficients in the OLS models can be interpreted as the average change in deprivation score in each domain associated with each event holding all else constant. A positive (negative) coefficient indicates moves into more (less) deprived neighbourhoods.

The bottom panel displays neighbourhood adjustments associated with housing adjustments after controlling for those associated with life-course events (top panel) and other housing adjustments. The estimates show that moving into a better housing tenure (e.g. from renting to owning) is associated with improvements in the neighbourhood quality when measured by the overall IMD and by five of the seven domain indices. The reverse is true for moving into a worse tenure. Moreover, moving into a larger house with more excess rooms seems to take singles into better neighbourhoods, although this association is not as evident as the tenure effect.

The results in the top panel show the effects of life-course events on neighbourhood quality, holding constant changes in housing quality and other life-course events. The estimates indicate that for singles, most of the life-course events that we consider have no statistically significant net association with neighbourhood quality adjustment. One exception is ceasing to live with parents which is associated with moving into more deprived neighbourhoods in terms of overall IMD and the health and disability, crime and living environment domains. Young people leaving their parental home tend to move into more deprived neighbourhoods. The only other events that have statistically significant effects on neighbourhood quality adjustments are entering work and a child leaving home. Entering work is associated with more deprived

neighbourhoods in terms of education, but less deprived neighbourhoods in terms of the living environment. A child leaving home is associated with single people moving to more deprived neighbourhoods, in terms of overall IMD, income, employment and the living environment.

Table 7 presents the results on the relationship between life-course events, housing adjustments and objective neighbourhood quality adjustments for couples that move. Moving into a worse housing tenure is again associated with worse neighbourhood quality across five of the eight deprivation measures, although moving into a better tenure or a larger house has little affect on neighbourhood quality adjustments for couples. There is a (weak) association of moving into better housing tenure with increased deprivation in the education domain. This could represent a trade-off between location and tenure status in a bid to afford owner-occupation. The effects of life-course events 'net' of housing adjustments indicate that again, while many of the life-course events we consider significantly affect the probability of a move, most of them have no statistically significant effect on neighbourhood quality adjustment conditional on moving. Among the employment-related events, a husband's unemployment is associated with moving into more deprived LSOAs as measured along most dimensions. A move coinciding with a wife's unemployment does not result in significant changes in deprivation score which indicates that couples can compensate for this and the other employment-related events of husbands and wives. Couples whose moves take place in the same year that a new baby is born move into better neighbourhoods as assessed by the overall IMD and the employment and education indices.

In summary, several employment-related and demographic life-course events seem important in triggering moves, but these one-off events do not result in significant changes in neighbourhood quality, holding housing adjustment constant. Important exceptions are the transition from living with parents to forming own households for singles and a husband's unemployment as well as the birth of a child for couples.

To get a more complete picture of neighbourhood quality adjustment we also examine the relationship between life-course events and housing adjustments with different types of changes in *subjective* perceptions of neighbourhoods among movers. As we

have four possible state transitions which are not ordered we use a multinominal logit model for their probabilities. Unfortunately relatively small sample sizes and sparsely populated cells force us to restrict the analysis to three of the four possible transitions: (1) from liking the neighbourhood at wave t–1 to liking the new neighbourhood after a move at wave t; (2) from not liking the neighbourhood to liking the new neighbourhood; and (3) from liking the neighbourhood to not liking the new neighbourhood. Thus we omit the not like – not like transition due to small sample sizes. We also drop the retirement variable because of sparsely populated cells. Transition (1) is treated as the reference group. We report relative risk ratios which are the exponentials of the fitted parameters of the multinomial logit model. These show, for each life-course event and housing change, how the relative risk of experiencing transition (2) or (3) rather than (1) differs between households who have experienced a given event/change and those who have not, holding constant values of the other covariates. A relative risk ratio greater (smaller) than one on a given life-course event would indicate that households who experienced this event are more (less) likely than other households to undergo transition (2) or (3) over (1).

The results are presented in Table 8. We do not display the estimates for singles, as the Likelihood Ratio test indicates that we cannot reject the null hypothesis that all coefficients are simultaneously equal to zero at conventional levels of significance. For couples we find that similar events are associated with subjective neighbourhood quality adjustment for both husbands and wives. For example, a husband entering work, entering unemployment and changing job and or employer increases the likelihood for both spouses that the move is from a liked neighbourhood to a disliked neighbourhood rather than moving between neighbourhoods which were both liked. A possible interpretation is that these negative transitions are the result of longer term unstable job attachment which eventually leads to a downward adjustment in terms of neighbourhood. The magnitudes of the effects are considerably larger for wives than for husbands. For example, a husband changing job and/or employer doubles the relative risk of a negative subjective neighbourhood transition for husbands and quadruples it for wives. For both spouses a husband's unemployment is associated with the largest effect on the chances that the neighbourhood transition is negative, making this transition six (eleven) times more likely for husbands (wives) than a neutral transition, compared to not having the husband entering unemployment.

A wife entering work approximately halves the relative risk that the move is from a neighbourhood that a couple did not like to one they liked for both husbands and wives, while a wife entering inactivity is associated with a decreased likelihood of a positive neighbourhood transition for wives only. A new baby more than doubles the relative chances of making a positive subjective neighbourhood transition for husbands, but for wives this effect is not statistically significant. The effect of housing adjustment on neighbourhood quality shows that improving housing tenure increases the likelihood that the move is from a neighbourhood that the spouses did not like to one that they liked. It increases the probability relative to that of the move being between two liked neighbourhoods by a factor of 1.5. Conversely, moving into a worse tenure is associated with moving into a neighbourhood not favoured by husband or wife. Changes in the number of excess rooms have no effect on the subjective neighbourhood transitions.

A comparison of these effects with the results obtained on objective neighbourhood quality adjustments (presented in table 7) shows several similarities. In particular, the negative effect of a husband's unemployment and the positive effect of a new baby on neighbourhood adjustment emerge for both objective and subjective measures of neighbourhood quality. Along both dimensions of neighbourhood quality the results seem to indicate that the effects of a husband's job-related events on neighbourhood quality adjustments are more important than the wives' job-related events. The negative effects of moving into a worse housing tenure found for the objective quality measures is also replicated using the subjective measure.

However, there are also some differences. In addition to most of the effects found for objective neighbourhood quality adjustments, the analysis focusing on subjective adjustments also finds that moving into a better tenure increases the relative risk of a neighbourhood transition being positive, and there are negative subjective effects of a husband taking up work. This could suggest that some aspects of neighbourhoods that are important to individual's assessment of neighbourhood quality are not captured in the Indices of Multiple Deprivation. Alternatively, it is possible that the subjective measure is picking up negative or positive feelings associated with certain life events or housing changes. For example, a move related to a husband taking up work could

be the result of instable job attachment and financial hardship, reflected in the way a new neighbourhood is seen. Likewise, the satisfaction associated with having achieved a better housing tenure could make a neighbourhood appear in a better light. Finally, differences in results for objective and subjective neighbourhood quality measures may also result from the fact that our deprivation measure is continuous whereas liking the neighbourhood is a binary variable. The likelihood that the transition is of a particular type in our model setup is affected by the likelihood of being in a particular state at time *t*-1. Hence a reduced (increased) probability of experiencing a not like-like transition compared to the base case (like-like transition) could indicate that individuals experiencing certain life events were unlikely (likely) to have been residing in a neighbourhood they did not like at time *t*-1. Wives taking up work, for example, could be less likely to have been in a neighbourhood they did not like, and this would explain why no significant change in objective neighbourhood quality was found for this group.

5. Conclusions

We find that both subjective and objective neighbourhood quality affect the decision to move house for couples, after controlling for life-course events and housing characteristics. In particular, living in a neighbourhood that a wife (husband) likes reduces the relative odds of a move by 89% (46%) compared to living in a neighbourhood that she (he) dislikes, holding the other variables constant. Hence the wife liking the current neighbourhood has a much larger effect than the husband liking the neighbourhood on the relative odds of moving home. The probability of moving house also increases with neighbourhood deprivation for couples, but the effect is smaller and disappears when entered into the mobility equations together with subjective measures. A one unit increase in the IMD score, on a scale from 0 to 100, results in a 0.5% increase in the odds of moving for couples. Not all aspects of objective deprivation are equally important among couples, with deprivation in the crime and the living environment domains having the strongest impact.

The mobility behaviour of singles appears to be determined by subjective, but not objective measures of neighbourhood quality. Liking the neighbourhood of residence reduces the relative odds of moving by about 60% compared to not liking the neighbourhood. There is no statistically significant effect of neighbourhood

deprivation on the likelihood of a move. Of the life-course events, we find that for singles entering work, a new baby, ceasing to live with parents, marital dissolution (more so for men than women) and private tenancy are associated with residential mobility. For couples, the husband entering work, inactivity, retirement or changing jobs, and the wife entering retirement all increase the relative odds of moving home, as does living in large houses and living in rented accommodation. In our analysis we treat these life-course events as exogenous, and results may be biased if this does not hold.

Among singles that move, most of the life-course events that we consider have no statistically significant association with moving into more or less deprived LSOAs. Ceasing to live with parents, entering work or having a child leave home are the only events that matter when holding housing adjustment constant, and they generally lead singles into more deprived neighbourhoods. As expected, moving into better (worse) housing tenure is associated with better (worse) neighbourhood outcomes, and moving into larger houses also improves the objective neighbourhood quality.

Most employment-related events of the husband or the wife have no statistically significant effect on objective neighbourhood quality adjustments of couples, conditional on moving. The only life-course event that seems to seriously affect couples is a husband becoming unemployed, which leads to moves that are made into more deprived areas, whereas having a new baby is associated with improved neighbourhood quality outcomes. As for singles, moving into worse housing tenure is associated with deteriorations in neighbourhood quality. When neighbourhood quality is measured in subjective terms, not only a husband's unemployment, but also his job change and taking up of work lead to the neighbourhood transition being negative (from liking the neighbourhood to not liking it) for couples, perhaps as a result of unstable job attachment. In line with expectations moves into a worse (better) housing tenure are associated with worse (better) better neighbourhood outcomes in subjective terms.

For couples, estimates of neighbourhood adjustment derived using objective measures of neighbourhood quality to a large extent correspond to those obtained using a subjective measure. There are several possible explanations for the remaining

differences. These could result from not fully capturing all important aspects of a neighbourhood in the Indices of Multiple Deprivation; from life-course events affecting the subjective perception of a neighbourhood; from differences in the modelling approaches for changes in continuous and in binary outcomes.

Given that the quality of the neighbourhood a household lives in affects important economic, social and health outcomes, our results indicate that some life-course events will have repercussions beyond the immediate effects of these events. For example, a husband's unemployment is associated with immediate income loss, but via a move into a worse neighbourhood is likely to have a wider impact not only for the person himself but for the family as a whole.

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Table 1: Mover and stayer characteristics, singles and couples

	Singles		Couples	
	Movers *t*–1, *t*	Stayers *t*–1, *t*	Movers *t*–1, *t*	Stayers *t*–1, *t*
Life-course events between t–1 and t				
Into work	17.1	9.0	6.2	2.6
Into unemployment	4.0	2.8	2.6	0.9
Into inactivity	7.5	4.8	2.7	1.6
Into retirement	0.7[1)]	0.7[1)]	1.6[1)]	1.6[1)]
Change job/employer	19.4	11.7	21.6	11.3
Wife into work			10.8	5.8
Wife into unemployment			3.4	1.2
Wife into inactivity			5.9	3.2
Wife into retirement			1.9[1)]	1.3[1)]
Wife change job			12.4	8.2
New baby	2.0	0.5	7.1	3.1
Cease living with parents	19.7	0.4		
Child reaches school age	2.7[1)]	2.1[1)]	11.8	7.1
Child leaves home	5.7	1.7	2.8	4.1
Out of partnership	16.8	4.1		
Housing and neighbourhood characteristics at t–1				
Home owner outright	14.3	30.6	16.0	30.6
Home owner mortgage	32.9	41.8	50.7	54.9
Local Authority rent	14.4	24.1	11.8	10.5
Private rent	35.6	7.1	20.9	3.4
Like neighbourhood: single	83.5	91.0		
Like neighbourhood: husband			85.1	93.6
Like neighbourhood: wife			67.7	92.6
Mean IMD score	22.8	22.8	20.7	18.5
Household-year observations	1,819	11,958	1,236	13,525

Notes: BHPS 1999–2006 and IMD 2004/2007. Weighted using BHPS cross-sectional weights. Table shows percentage of group for which life-course events, housing characteristics and neighbourhood quality assessment apply. [1)] Except for these all differences between movers and stayers within the singles and couples sample are statistically significant beyond the 5% level.

Table 2: Average IMD ranking of LSOA of residence by subjective perceptions of neighbourhood quality

Domain	Singles: like neighbourhood			Husbands: like neighbourhood			Wives: like neighbourhood		
	Yes	No	Difference	Yes	No	Difference	Yes	No	Difference
Index of Multiple Deprivation	15,902	11,058	4,844	18,618	11,447	7,171	18,578	13,069	5,509
Income	16,007	11,071	4,936	18,655	11,273	7,382	18,622	12,859	5,763
Employment	15,899	11,644	4.255	18,176	11,813	6,363	18,132	13,340	4,792
Education, Skills and Training	16,137	11,631	4,506	17,783	10,852	6,931	17,739	12,471	5,268
Health and Disability	15,846	11,704	4,142	18,283	12,015	6,268	18,228	13,633	4,595
Barriers to Housing	16,331	15,883	448	16,652	16,279	373	16,662	16,243	419
Crime	15,791	12,365	3,426	18,176	12,458	5,718	18,151	13,680	4,471
Living Environment	15,651	13,001	2,650	18,180	13,759	4,421	18,173	14,588	3,585
Household-year observations	12,520	1,720		13,701	1,687		13,740	1,648	

Notes: BHPS 1999–2006 and IMD2004/2007. Weighted using BHPS cross-sectional weights

Table 3: Changes in IMD ranking of LSOA of residence by subjective perceptions of neighbourhood quality for moving households

	Singles			Husbands			Wives		
Change in mean ranking	(1) Like-like	(2) Not like-like	(3) Like-not like	(1) Like-like	(2) Not like-like	(3) Like-not like	(1) Like-like	(2) Not like-like	(3) Like-not like
Index of Multiple Deprivation	–269	3,429	–2,987	789	4,784	–3,203	1,362	3,314	–1,858
Income	–285	3,039	–3,466	506	4,521	–2,964	1,075	3,102	–1,428
Employment	–336	2,290	–2,491	260	4,166	–3,253	753	2,525	–1,920
Education, Skills and Training	–352	3,576	–3,962	429	4,033	–3,142	741	3,084	–1,771
Health and Disability	–316	3,051	–2,140	478	3,802	–3,226	1,114	1,868	–1,735
Barriers to Housing	38	893	–957	271	249	390	49	344	3,458
Crime	–462	2,712	–376	1,235	3,710	–2,470	1,683	2,896	–4,397
Living Environment	–494	1,181	62	1,466	4,098	–896	2,283	3,390	–3,231
Household-year observations	1,339	188	122	949	150	57	725	159	35

Notes: BHPS 1999–2006 and IMD 2004/2007. Weighted using BHPS cross-sectional weights.

Table 4: Residential mobility random effects logit: models without neighbourhood quality measures

	singles		couples	
	Odds ratio		Odds ratio	
Life-course events				
Into work	1.560**	(3.21)	1.499*	(2.15)
Into unemployment	1.159	(0.64)	1.376	(1.07)
Into inactivity	0.922	(0.41)	1.990*	(2.51)
Into retirement	1.924	(1.54)	1.718+	(1.86)
Change job/employer	1.016	(0.13)	1.323**	(2.70)
Wife into work			1.109	(0.75)
Wife into unemployment			1.323	(1.13)
Wife into inactivity			1.156	(0.81)
Wife into retirement			1.974*	(2.25)
Wife change job/employer			0.908	(0.78)
New baby	5.127**	(3.79)	1.131	(0.79)
Child reach school age	0.703	(1.11)	0.979	(0.16)
Child leaves home	1.830*	(2.51)	1.063	(0.27)
Cease living with parent/s	90.424**	(22.25)		
Out of partnership	7.701**	(8.48)		
Out of partnership and female	0.468*	(2.53)		
Housing characteristics				
Home owner outright	0.629**	(3.97)	0.819+	(1.83)
Local Authority rent	1.059	(0.51)	1.213	(1.59)
Private rent	9.862**	(23.22)	7.047**	(17.64)
Number of excess rooms	0.981	(0.50)	0.736**	(7.53)
Rho (variance partition coefficient)	0.218		0.166	
Rho standard error	0.026		0.025	
Variance of household random effect	0.916		0.654	
Log-likelihood	–3,530.76		–3,672.27	
N	13,464		14,583	

Notes: Dependent variable = 1 for movers and zero for stayers. Random effects logit, means of time-variant variables included as additional regressors. For couples, the first set of employment variables relate to the husband. In parentheses are the absolute values of the z statistics which are the ratios of the actual coefficients divided by their estimated standard errors. BHPS 1999–2006 and IMD 2004/2007. + significant at 10%, * significant at 5%, **significant at 1%.

Table 5: Residential mobility random effects logit: neighbourhood quality effects odds ratios

	singles				couples			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Life-course events	yes	yes	yes	yes	yes	yes	yes	yes
Housing characteristics	yes	yes	yes	yes	yes	yes	yes	yes
Likes neighbourhood (husb)	0.393 **			0.388 **	0.536 **			0.532 **
	(6.06)			(6.14)	(3.69)			(3.72)
Likes neighbourhood (wife)					0.109 **			0.108 **
					(16.87)			(16.89)
IMD score		0.999		0.998		1.005 *		0.998
		(0.37)		(1.36)		(2.33)		(0.68)
Income[1)]			0.996				1.005	
			(1.28)				(1.57)	
Employment[1)]			0.993 +				1.006	
			(1.80)				(1.60)	
Educ., Skills & Training[1)]			0.995 *				1.002	
			(2.25)				(0.92)	
Barriers to Housing[1)]			0.997				0.999	
			(1.19)				(0.23)	
Health & Disability[1)]			1.002				1.006 +	
			(0.72)				(1.78)	
Crime[1)]			1.007 *				1.010 **	
			(2.09)				(3.02)	
Living Environment[1)]			1.004 +				1.010 *	
			(1.85)				(4.42)	
Rho (variance partition coefficient)	0.223	0.218		0.222	0.184	0.169		0.182
Rho standard error	0.026	0.026		0.026	0.025	0.025		0.026
Variance of household random effect	0.938	0.915		0.936	0.739	0.671		0.734
Log-likelihood	–3,509.22	–3,530.60		–3,508.29	–3,373.37	–3,670.85		–3,373.13
N	13,464				14,583			

Notes: Dependent variable = 1 for movers and zero for stayers. Random effects logit, means of time-variant variables included as additional regressors. The 'yes' in the first two rows indicate that models include the life course and housing covariates as in Table 4, but results are not reported. In parentheses are the absolute values of the z statistics which are the ratios of the actual coefficients divided by their estimated standard errors. BHPS 1999–2006 and IMD 2004/2007. [1)] Each sub-index entered into the random effects logit model separately, reporting coefficients and z values for the separate models. + significant at 10%, * significant at 5%, **significant at 1%.

Table 6: Objective neighbourhood quality adjustments of singles by life-cycle events

	IMD	Income	Employment	Education	Barriers to Housing	Health & Disability	Crime	Living environm.
Life-course events								
Into work	0.462	0.009	0.008 +	2.830 *	–0.364	–0.044	–0.073	–2.517 +
	(0.45)	(1.22)	(1.65)	(2.37)	(0.47)	(0.75)	(1.22)	(1.85)
Into unemployment	0.657	0.010	0.004	1.620	0.679	0.007	0.003	–1.878
	(0.33)	(0.64)	(0.42)	(0.62)	(0.46)	(0.06)	(0.02)	(0.74)
Into inactivity	1.306	0.006	–0.000	0.714	0.872	0.113	0.077	2.800
	(0.99)	(0.59)	(0.04)	(0.45)	(0.75)	(1.38)	(0.85)	(1.56)
Into retirement	1.782	–0.015	0.009	7.652	–1.120	0.154	–0.100	–2.326
	(0.40)	(0.35)	(0.44)	(1.46)	(0.23)	(0.54)	(0.37)	(0.65)
Change job/empl.	–0.065	0.002	0.000	0.167	0.287	–0.030	–0.006	–0.374
	(0.07)	(0.32)	(0.08)	(0.15)	(0.39)	(0.56)	(0.10)	(0.33)
Out of partnership	–0.767	–0.009	–0.002	–0.505	–1.756	0.045	0.009	0.932
	(0.44)	(0.69)	(0.26)	(0.24)	(1.53)	(0.56)	(0.09)	(0.52)
Out of partnership and female	–0.220	0.002	–0.000	1.043	–1.138	–0.002	–0.039	–0.389
	(0.11)	(0.14)	(0.01)	(0.44)	(0.79)	(0.02)	(0.32)	(0.18)
Leave parent home	3.806 **	0.016 +	0.005	0.278	–0.657	0.364 **	0.405 **	10.615 **
	(2.94)	(1.70)	(0.82)	(0.20)	(0.66)	(4.93)	(5.31)	(7.25)
New baby	0.635	0.016	0.006	1.654	0.507	–0.063	–0.114	–5.882
	(0.23)	(0.78)	(0.52)	(0.45)	(0.21)	(0.41)	(0.69)	(1.59)
Child school age	1.597	0.009	0.003	2.574	0.445	0.022	0.180 +	1.118
	(0.80)	(0.52)	(0.30)	(0.80)	(0.22)	(0.29)	(1.87)	(0.44)
Child leaves home	4.566 *	0.034 *	0.015 *	3.492	0.780	0.141	0.152	4.718 *
	(2.50)	(2.45)	(2.01)	(1.36)	(0.66)	(1.61)	(1.35)	(2.13)
Housing adjustments								
Better tenure	–3.203 **	–0.020 **	–0.009 +	0.277	–0.757	–0.169 **	–0.243 **	–6.877 **
	(3.22)	(2.74)	(1.95)	(0.24)	(1.01)	(3.03)	(4.03)	(5.41)
Worse tenure	3.957 **	0.027 **	0.012 *	3.021 *	0.285	0.180 **	0.221 **	5.757 **
	(3.65)	(3.20)	(2.31)	(2.35)	(0.36)	(3.08)	(3.59)	(4.85)
Change in number of excess rooms	–0.383 *	–0.003 *	–0.001	–0.268	–0.313 +	–0.027 *	–0.024 +	0.145
	(2.05)	(2.33)	(1.23)	(1.22)	(1.81)	(2.33)	(1.90)	(0.62)
Constant	–0.945	–0.005	–0.003	–1.888 **	0.257	–0.045	–0.038	–0.833
	(1.58)	(1.02)	(0.96)	(2.77)	(0.60)	(1.40)	(1.07)	(1.22)
R^2	0.050	0.035	0.016	0.013	0.010	0.067	0.079	0.121
N	1,803							

Notes: OLS estimates, dependent variable is change in deprivation score of LSOA of residence before and after a move. Absolute values of t-statistics (in parentheses) derived from standard errors adjusted for clustering on individuals. BHPS 1999–2006 and IMD 2004/2007. + significant at 10%, * significant at 5%, **significant at 1%.

Table 7: Objective neighbourhood quality adjustments of couples by life-cycle events

	IMD	Income	Employm.	Education	Barriers to Housing	Health & Disability	Crime	Living Environ.
Life-course events								
Into work	0.407	–0.000	–0.001	–0.708	–0.068	0.048	0.060	3.526
	(0.21)	(0.01)	(0.12)	(0.28)	(0.05)	(0.48)	(0.57)	(1.57)
Into unemploym.	8.837 **	0.064 **	0.029 *	9.942 *	1.505	0.316 **	0.392 **	0.727
	(3.29)	(2.98)	(2.28)	(2.49)	(0.65)	(2.62)	(2.63)	(0.18)
Into inactivity	3.165	0.023	0.012	5.230	–1.742	0.036	0.106	2.462
	(1.11)	(1.14)	(0.95)	(1.46)	(1.16)	(0.24)	(0.66)	(0.70)
Into retirement	–0.751	–0.004	0.002	1.113	–2.933	–0.024	0.241	–4.384
	(0.21)	(0.17)	(0.15)	(0.33)	(0.66)	(0.12)	(0.95)	(0.92)
Change job/empl.	0.970	0.013 +	0.001	2.164 +	–0.253	0.000	–0.023	0.123
	(0.99)	(1.72)	(0.22)	(1.76)	(0.27)	(0.01)	(0.36)	(0.11)
Wife into work	1.317	0.013	0.005	1.581	1.634	0.050	0.083	–1.197
	(1.06)	(1.30)	(0.82)	(0.94)	(1.40)	(0.76)	(1.02)	(0.81)
W. into unemploy.	–1.285	–0.002	–0.004	–1.095	–2.330	–0.051	0.045	–0.941
	(0.53)	(0.11)	(0.33)	(0.32)	(1.50)	(0.42)	(0.32)	(0.33)
W. into inactivity	–0.098	–0.006	–0.002	–0.876	–1.077	0.040	0.027	4.183 *
	(0.05)	(0.44)	(0.20)	(0.42)	(0.67)	(0.41)	(0.28)	(2.22)
W. into retirement	–4.543	–0.037 +	–0.014	–4.265	–4.278	–0.230	–0.219	–3.841
	(1.45)	(1.75)	(0.87)	(1.33)	(0.71)	(1.30)	(1.32)	(1.05)
Wife change job/e.	1.032	0.004	0.008	1.441	0.947	0.032	0.013	–1.525
	(0.78)	(0.43)	(1.20)	(0.97)	(0.86)	(0.43)	(0.15)	(0.89)
New Baby	–4.233 *	–0.024	–0.019 *	–5.058 *	–2.191	–0.123	–0.152	–2.490
	(2.44)	(1.63)	(2.11)	(2.38)	(1.55)	(1.34)	(1.48)	(1.56)
Child school age	–0.778	–0.013	–0.004	–0.046	0.454	–0.112 +	0.038	–0.384
	(0.62)	(1.31)	(0.73)	(0.03)	(0.40)	(1.71)	(0.54)	(0.28)
Child leaves home	–1.601	–0.011	–0.001	–3.897	2.156	–0.052	–0.172	–1.729
	(0.62)	(0.53)	(0.05)	(1.00)	(1.00)	(0.37)	(1.09)	(0.59)
Housing adjustments								
Better tenure	0.470	0.006	–0.002	2.756 +	–1.104	0.081	–0.004	2.267
	(0.42)	(0.72)	(0.46)	(1.92)	(1.15)	(1.31)	(0.05)	(1.58)
Worse tenure	3.065 *	0.024 *	0.015 *	3.798 *	–0.500	0.171 *	0.062	0.781
	(2.38)	(2.46)	(2.57)	(2.25)	(0.47)	(2.53)	(0.86)	(0.53)
Change in number of excess rooms	–0.324	–0.002	–0.002	–0.023	0.067	–0.020	–0.021	–0.486 +
	(1.15)	(0.97)	(1.32)	(0.08)	(0.35)	(1.39)	(1.16)	(1.69)
Constant	–1.878 **	–0.010 *	–0.006 *	–2.367 **	–0.019	–0.085 *	–0.111 **	–2.743 **
	(2.87)	(2.11)	(2.02)	(2.76)	(0.03)	(2.43)	(2.66)	(3.82)
R^2	0.028	0.028	0.025	0.025	0.012	0.021	0.014	0.017
N	1,226							

Notes: OLS estimates, dependent variable is change in deprivation score of LSOA of residence before and after a move. Absolute values of t-statistics (in parentheses) derived from standard errors adjusted for clustering on households. BHPS 1999–2006 and IMD 2004/2007. + significant at 10%, * significant at 5%, **significant at 1%.

Table 8: Subjective neighbourhood quality adjustments of husbands and wives

	husbands		wives	
	Not like-like	Like – not like	Not like-like	Like – not like
Life-course events				
Husband into work	1.447	4.000 **	1.443	5.395 **
	(1.00)	(3.20)	(0.91)	(2.83)
Husband into unemployment	1.614	6.288 **	1.056	10.994 **
	(0.90)	(3.20)	(0.08)	(3.01)
Husband into inactivity	1.434	2.262	1.501	0.000
	(0.75)	(1.05)	(0.87)	(0.00)
Change job/employer	0.769	2.170 *	0.781	4.078 **
	(1.11)	(2.38)	(1.03)	(3.45)
Wife into work	0.464 *	1.410	0.469 *	0.822
	(2.17)	(0.86)	(2.18)	(0.34)
Wife into unemployment	0.856	0.759	1.011	0.353
	(0.33)	(0.35)	(0.02)	(0.93)
Wife into inactivity	0.507	1.592	0.391 *	2.165
	(1.55)	(0.98)	(2.01)	(1.41)
Wife change job/employer	1.209	1.516	0.645	0.775
	(0.74)	(0.99)	(1.64)	(0.48)
New baby	2.310 **	1.683	1.608	1.562
	(2.77)	(1.14)	(1.54)	(0.84)
Child reach school age	0.951	1.845 +	1.159	1.369
	(0.18)	(1.66)	(0.59)	(0.68)
Child leaves home	0.750	1.220	1.582	0.922
	(0.46)	(0.26)	(0.93)	(0.07)
Housing adjustments				
Better tenure	1.475 +	1.553	1.635 *	1.254
	(1.79)	(1.16)	(2.24)	(0.43)
Worse tenure	0.944	2.258 *	1.279	2.805 *
	(0.22)	(2.44)	(0.93)	(2.48)
Change in number of excess rooms	1.080	0.939	1.007	0.931
	(1.57)	(1.16)	(0.15)	(0.73)
Log likelihood	–634.40		–535.91	
Likelihood Ratio $\chi 2$	61.42		58.64	
N	1,156		919	

Notes: Results from multinominal logit models, figures reported are relative risk ratios. Absolute value of z statistics in parentheseses. Transition from liking to liking the neighbourhood is base comparison group. BHPS 1999–2006