

Occupational Mobility and Living in Deprived Neighbourhoods: Housing Tenure Differences in ‘Neighbourhood Effects’

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Abstract The literature on neighbourhood effects suggests that the lack of social mobility of some groups has a spatial dimension. It is thought that those living in the most deprived neighbourhoods are the least likely to achieve upward mobility because of a range of negative neighbourhood effects. Most studies investigating such effects only identify correlations between individual outcomes and their residential environment and do not take into account that selection into neighbourhoods is a non-random mechanism. This paper investigates occupational mobility between 1991 and 2001 for those who were employed in Scotland in 1991 by using unique longitudinal data from Scottish Longitudinal Study (SLS). We add to the existing literature by investigating neighbourhood effects on occupational mobility separately for social renters, private renters and home owners. We find that ‘neighbourhood effects’ are strongest for home owners, which is an unexpected finding. We argue that the correlation between characteristics of the residential environment and occupational mobility can at least partially be explained by selection effects: homeowners with the least resources, who are least likely to experience upward mobility, are also most likely to sort into the most deprived neighbourhoods. Social housing tenants experience less selective sorting across neighbourhoods as other than market forces are responsible for the neighbourhood sorting mechanism.

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Introduction

It has been argued that Britain is moving towards a meritocracy, in which one would expect social advancement to result from an individual's talents and abilities, and not depend on social class, where you were born, or where you live (van Ham et al. 2012b). However, there seems to be little evidence of any increase in social mobility in the UK and many other West European societies (Breen 2004; Blanden et al. 2005; Nunn et al. 2007). Social mobility may even have fallen in UK for those in the lowest income groups, despite the expansion of the education system and the erosion of traditional class structures. A recent government report in the UK highlighted that amongst the top occupations, including medicine and journalism, access was limited for individuals from deprived backgrounds, whilst even in those professions that had taken steps to open up their access routes, including legal firms and the civil service, progression was still slow. Whilst only 7 % of UK school children are educated within the private education system, they still commanded 27 % of all civil service occupations (Independent 2012). According to the UK government report *Opening Doors, Breaking Barriers: A Strategy for Social Mobility* "In Britain today, life chances are narrowed for too many by the circumstances of their birth: the home they're born into, the neighbourhood they grow up in or the jobs their parents do. Patterns of inequality are imprinted from one generation to the next" (Nick Clegg, Cabinet Office 2011).

The literature on neighbourhood effects (see van Ham et al. 2012a, 2013; Manley et al. 2013) suggests that the lack of social mobility of some groups has a spatial dimension (see Ellen and Turner 1997; Dietz 2002; Durlauf 2004; van Ham and Manley 2010). The concept of neighbourhood effects refers to the idea that the neighbourhood in which an individual lives has an independent effect on the life course of that individual. Research has suggested that there is evidence of negative neighbourhood effects of living in deprived neighbourhoods on a diverse range of outcomes, including educational achievement (Galster et al. 2007); entry into and out of work (Van der Klaauw and Ours 2003); crime and violent behaviour (Friedrichs and Blasius 2003); social exclusion (Buck 2001); and social mobility (Buck 2001). There is now a growing set of more critical literature that questions the validity of many of the conclusions drawn in the neighbourhood effects literature. For instance, Oreopoulos (2003) and van Ham and Manley (2010) have both provided critical arguments that the vast majority of evidence presented in the literature investigating neighbourhood effects is unconvincing. The problem is that many studies claim to uncover causal pathways, while in reality they have only found correlations between living in places of disadvantage and poorer individual outcomes. Of course it is the case that individuals living in deprived neighbourhoods are, on average, more likely to be unemployed, in receipt of welfare payments and other benefits, and have worse health outcomes than individuals in less deprived areas. However, this does not mean that these correlations can be taken as evidence of a causal mechanism where the neighbourhood context is responsible for the individual outcomes. In other words, the key question which the literature should address is whether a disadvantaged neighbourhood can make an individual's

outcomes poorer or whether poor people enter disadvantaged neighbourhoods because they are excluded, through resources or other constraints, from living in more advantaged places (see Cheshire 2012; Slater 2013)?

There is little work in the current literature that explicitly investigates the link between living in deprived neighbourhoods and occupational mobility (van Ham et al. 2012a). In this paper we investigate occupational mobility between 1991 and 2001 for those who were employed in Scotland in 1991. The aim of this study is to get more insight in the relationship between living in a deprived neighbourhood and occupational mobility. We will address this by asking the following two questions:

1. Are individuals living in deprived neighbourhood less likely to achieve upward occupational mobility than individuals living in better off places?
2. Do the results found in answer to question 1 appear robust across all groups in society, or are there subgroups that are more or less affected by neighbourhood context?

The second question is in response to the criticism on the neighbourhood effects literature by Small and Fieldman (2012) who said that the vast majority of work has tended to identify average effects for the whole population. There is no reason to assume that neighbourhood context, if it actually does influence individual outcomes, does so for all individuals equally. To overcome this problem we explore sub groups within the population to determine if apparent neighbourhood effects can be accounted for through other societal processes.

To answer our research questions, we use unique data from the Scottish Longitudinal Study (SLS) which is a 5.3 % sample of the Scottish population linked through time by matching census forms from 1991 and 2001. Detailed occupational information from the two censuses allowed us to determine occupational mobility over a 10 year period. Low level geocoding means that it is possible to add information about neighbourhoods to individual records and we can link 1991 neighbourhood characteristics (using two definitions of neighbourhoods) to 2001 occupational achievement. The data is not without limitations, but it is one of the best longitudinal datasets available in the UK to study neighbourhood effects.

Neighbourhood Effects, Selective Mobility and Occupational Status

This paper draws on and contributes to a number of literatures. The first of these is the literature on social (and occupational) mobility. The second literature relates to neighbourhood effects and the processes through which neighbourhood contexts are thought to influence individual outcomes. Both of these are related to a third body of literature on residential sorting into and out of neighbourhoods.

Social mobility remains an issue of great concern to western governments. There are numerous reports which state that, since the 1970s the rate at which individuals are able to improve their social status has been slowing. Breen (2004) and Blanden and colleagues (2005) both conclude that relative social mobility, whereby individuals are able to improve their social status relative to others in their cohort, has stagnated and even declined for those in the lowest income groups. This is despite the expansion of

the education with the elimination of grammar schools and the introduction of full comprehensive education systems for all. Recognising that the social mobility debate is complex and difficult to unpick, Gorad (2008) and Jantti and colleagues (2006) have suggested that the discussions around the death of social mobility in the United Kingdom have been overblown and that, if anything, social mobility in Britain is on a par with the experience of the Nordic Countries. In explaining the changes in social mobility over time, the one aspect that the literature does agree on is the role of education. Along with social class, gender and ethnicity, education is seen as the main driver of occupational achievement.

The literature that has investigated the role of geography in socio-economic mobility has focussed mainly on the urban and regional scales. For example, the literature on escalator regions investigated the effects of living in large metropolitan areas on occupational mobility (see Fielding 1992; Findlay et al. 2009; Champion 2004 for examples). Other work has analysed the effect of spatial variations in access to job opportunities on occupational achievement (see van Ham et al. 2001 for an example). As yet, a relatively under-developed line of research has been the role that the very local environment, the neighbourhood, could have on occupational mobility outcomes. There is a wide literature presenting evidence that neighbourhoods where concentrations of social housing, deprivation and ethnic minorities exist are perceived to experience substantial disadvantage. There are many mechanisms through which such concentrations are thought to transmit disadvantage to individuals. In a recent overview, Galster (2012) identified 17 different mechanisms, which could be grouped into four categories: geographical mechanisms which rely on the organisation or distribution of resources or amenities; social interactive mechanisms which rely on the interactions between individuals in local neighbourhood spaces; environmental mechanisms whereby the condition of the local area can influence individual outcomes, especially with respect to health outcomes, and; Institutional mechanisms whereby (non)governmental service providers can exclude people or places from accessing their services.

With regard to the labour market, individuals living in neighbourhoods where there is, rightly or wrongly, a perceived concentration of social problems may, for example, experience stigma and discrimination, may be removed from mainstream services either because of a lack of local resources, dislocation from service and employment centres or exclusion from the transportation networks, or may suffer from the consequences of negative socialisation. There is a great deal of literature that suggests how concentrations of disadvantage can affect individual life courses. For instance, areas of high deprivation are frequently stigmatised when employers use neighbourhood reputations to discriminate between job applications (see Tunstall et al. 2012). Thus, living in a stigmatised neighbourhood can make it difficult for unemployed individuals to find work and for individuals in work to make significant occupational progression when applications are, either implicitly or explicitly, filtered by postcode. Similarly, firms with vacancies may choose not to advertise opportunities in job centres located within neighbourhoods with poor reputations limiting the access to employment and career progression for individuals living in those residential areas. The spatial mismatch hypothesis (Kain 1968) suggests that there are important (geographical) barriers between the locations of residence and work, and that a lack of transport between these locations can disadvantage some groups. With the peripheralisation of many large

social housing estates in Western Europe over the last 50 years spatial mismatch is frequently a problem for residents in deprived neighbourhoods. Even when in work, individuals can find it challenging to make the most of labour market opportunities if these opportunities arise outside their local environment because of the costs (temporal and financial) of travelling across the urban space (van Ham 2001). Finally the literature on negative socialisation suggests that in concentrations of disadvantage, individuals can adopt positive attitudes regarding being unemployed and using social benefits, reducing their search intensity on the labour market.

Much of the evidence of neighbourhood effects is based on the claim that causal mechanisms linking individual outcomes and neighbourhood contexts have been identified. However, in many cases this apparently causal evidence is not as robust as the literature suggests. There are a number of challenges associated with the identification of causal neighbourhood effects, such as overcoming the simultaneity problem; the omitted-context variables problem; and the endogenous membership problem. It is worth outlining these problems in more detail. The simultaneity problem (see Manski 1993) relates to the inference between individual behaviour based on the average behaviour of the group to which they belong. It is possible to limit the simultaneity problem by using longitudinal data which enables the ordering of events so that current outcomes can be tested against previous contexts. The omitted context variable problem relates to the omission of neighbourhood level variables that are important in explaining the dependent variable, but which have either not been included in the model through design (ie. not collected) or by omission (not considered sufficiently important to include) (see also the racial proxy hypothesis, Harris 1999). The final problem, the endogenous membership problem, relates to the fact that there may be omitted variables that are important at an individual level as well as at the neighbourhood level. A prime example of this is neighbourhood selection: individuals are not randomly distributed over neighbourhoods and previous research has demonstrated that neighbourhood entry and exit is a far from random process. For example, Schelling (1969, 1971) theorised that household preferences with regard to the type of neighbourhood to live in are strongly related to the characteristics of the people living in these neighbourhoods. Using ethnic preference, Schelling demonstrated that even a small preference to live in a neighbourhood with co-ethnics could lead to high levels of ethnic segregation. Clark (1991, 1992) empirically confirmed that Schelling's theoretical model was broadly correct, and demonstrated that much of the segregation in American cities was a consequence of (usually White) preferences to live among other households with similar ethnic profiles. Using data from Sweden, Hedman and colleagues (2011) demonstrated that neighbourhood choice was highly structured and led to the reproduction of neighbourhoods over time. The most important factor in determining the neighbourhood that an individual entered was their income. Within this constraint, households then sought neighbourhoods that had a set of characteristics similar to their own. Thus, households with children tended to enter neighbourhoods where there was a majority of other households with children. Similarly, neighbourhoods that had a high proportion of people who were unemployed tended to be accessed by unemployed people, not necessarily through choice, but as the result of a more limited choice set as a consequence of financial, housing and estate agent discrimination (see Aalbers 2012). Thus, there is clear evidence that individuals select their neighbourhoods based on a set of preferences and constraints, and all other things

being equal tend to live in places that contain other individuals and households that are similar to themselves. As a result, the evidence observed in many neighbourhood effects studies that there is a causal relationship between neighbourhood context and individual outcome may not be the result of a transmission mechanism, but instead an outcome of the selective mobility process. So it is very likely that it is not the neighbourhood that causes disadvantage but that disadvantaged people sort into disadvantaged neighbourhoods. This paper first investigates the relationship between living in a deprived neighbourhood and occupational mobility, and secondly it investigates whether there is any variation in this relationship between groups.

Data and Methods

The individual-level data were assembled from the Scottish Longitudinal Study (SLS)—a 5.3 % sample of the Scottish population linked through time by matching census forms from 1991 to 2001 (Boyle et al. 2009). Approximately 274,000 SLS members were identified from the 1991 census, and information for these individuals was linked from the 2001 census. This longitudinal design allows researchers to follow the same individuals over a 10-year period, investigating the effect of 1991 characteristics on 2001 outcomes. With special permission, researchers can access low-level geocoding, which enables the linking of individuals and their residential neighbourhood characteristics. Because of the 10 year gap between observations the amount of information available is limited. But because we are specifically interested in whether or not there is a long term effect of living in deprived neighbourhoods on occupational mobility we need the longer period of observation. Much of the neighbourhood effects literature uses a research design that proposes almost instantaneous effects of context on individual outcomes. In many cases, including when studying occupational mobility, such an expectation is unrealistic because many of the underlying social processes take some time to have an effect. Another advantage of using data which covers 10 years is that from year to year there is little change in an individual's occupational status, but over a longer period we expect much more change.

The research population used in this study consists of all employed individuals (both part and full time) aged between 16 and 50 years old in 1991. Occupational achievement is coded using the International Socio-Economic Index of occupational status (ISEI) (See Ganzeboom and Treiman 1996) which is a continuous scale ranging from 16 to 90 where the higher the number recorded, the higher the level of occupational status reached. For instance, an ISEI score of 16 maps to cleaners and domestic helpers; a score of 29 maps to a coffee shop barista; a score of 52 maps to a travel agency clerk; a score of 65 is related to social science professionals; and a score of 90 maps on to judges. The dependent variable in the main analyses in this paper is the difference between individual 1991 and 2001 I.E. scores.

The ways in which neighbourhoods are defined is an extensively debated topic, especially when using administrative data (Kearns and Parkinson 2001; Galster 2001). Many studies use large scale units to represent a neighbourhood (see for example Bolster, et al. 2007), while others use multiple scales acknowledging that no one definition of neighbourhood is likely to be sufficient to capture all the potential interactions that could be included in the neighbourhood effects literature (see for

instance, Buck 2001; Graham, et al. 2009; van Ham and Manley 2010; Manley and van Ham 2012). An additional problem here is what Kwan (2012) termed the uncertain context problem: as well as uncertainty about where the neighbourhood boundaries should fall, there is also uncertainty relating to whether or not the chosen units reflect the spatial scale of the processes that they are being used to represent (see also Manley et al. 2006 for a demonstration of this problem with British Census data). Together these challenges make the choice of neighbourhoods in neighbourhood effects studies non-trivial and the analyst needs to recognise that with their choices come compromises. In line with this, we accept that no one scale of administrative unit is likely to be ideal and adopt a multiscale approach using two neighbourhood scales. Many studies investigating neighbourhood effects have found strong evidence for effects when using very small areal units to represent the neighbourhood. To represent local areas, the first neighbourhood scale we adopt is the Output Area (OA): these were the smallest units available from the 1991 Census and contain on average 119 people in Scotland. The theories behind neighbourhood effects also suggest that larger neighbourhoods may also be important as areas that individuals both inside and outside the neighbourhood identify with, as well as containers for some of the more diverse functions of daily life. As a result, the second neighbourhood scale we adopt are CATTs (Consistent Areas Through Time), which have on average 503 residents. The use of OAs and CATTs for studying Occupational Mobility is consistent with the theories and mechanisms relating to neighbourhood effects. For instance, one of the mechanisms through which context may impact of occupational mobility is through the process of social contagion (for a full discussion of mechanisms see Galster 2012). Social contagion relates to the way in which individuals behave or the attitudes that they adopt, and how this may be changed by contact with people neighbouring their everyday lives. As such, a small spatial scale is required to investigate the effects of these ‘over the fence’ level interactions. For other mechanisms such as stigmatisation or the attitudes of ‘local market actors’ (for instance, employers) to certain neighbourhoods a larger spatial scale is required—something that is akin to a recognisable ‘neighbourhood’ in the mind of those external to the neighbourhood. In this case neighbourhood reputation (see Permentier et al. 2009) and the perceived qualities of the residents could be important with regard to an individual’s occupational success.

We included two area level characteristics in our models (see also van Ham and Manley 2010), both measured at the OA and CATT levels (see Table 1 for descriptives): firstly, a measure to provide information about the social economic environment of the neighbourhood, using the Carstairs Index (Carstairs and Morris 1990). This index is based on the level of male unemployment in an area, the number of households without a car, the level of overcrowding (over one person per room) and the social class of heads of households (categories IV and V). Neighbourhood deprivation was measured in five categories (quintiles), each containing 20 % of the overall deprivation distribution. The second area level characteristic included in our models is an urban–rural classification. The classification is based on population size and access to concentrations of population and measured in six categories (see also van Ham and Manley 2010): (i) cities (over 125,000 people); (ii) urban areas (10,000 to 125,000 people); (iii) small towns (3,000 to 10,000 people or within 30 min from towns with 10,000 people or more); (iv) remote towns (3,000 to 10,000 people over 30 min from settlement of over 10,000); (v) accessible rural (less than 3,000 people and within 30 min from places

with over 10,000 people); and (vi) remote (settlements with under 3,000 people, over 30 min from places with over 10,000 people). The urban–rural classification serves as a proxy for access to job opportunities (see also van Ham et al. 2001). Both of these area descriptors were measured for 1991 and do not vary over time. The main reason for fixing the area characteristics in time is to aid the identification of causal relationships and to overcome the simultaneity problem identified by Manski (1993) as discussed above.

To control for individual level characteristics which have been shown to be related to occupational achievement, we included a wide range of individual and household characteristics in our models (see also van Ham and Manley 2010). An overview of these variables can be found in Table 1. To avoid causality problems, all time varying characteristics, such as age, level of education, housing tenure, and whether or not an individual's partner also works were measured for 1991 (see also above). In cases where the SLS member did not have a partner, the average of the respondents with a partner is substituted. Because the model contains a variable indicating whether or not a partner is present this substitution of the means leads to unbiased coefficients of the 'partner works' dummy for those with a working partner (compare Cohen and Cohen 1975, chapter 7). We also included several variables indicating change between 1991 and 2001: change in self-reported health; change in household composition, and; change in the presence of children. Acknowledging that regression models would only provide average effects across the whole population, which is far from homogenous we also ran our models on various subgroups in the data (by age, education, mover status and tenure). The only subgroup of the data which gave additional insights was the split by housing tenure (see also Oreopoulos 2003; van Ham and Manley 2010). This final additional set of models is a step in the direction of overcoming the endogenous membership problem (and thus selection bias), and we believe that this approach offers a means through which it is possible to uncover additional information about the impact of neighbourhoods on individual outcomes.

Results

Table 2 presents the result of regression models of the change in ISEI scores between 1991 and 2001 at the Output Area level.¹ The models are built up in a stepwise manner to demonstrate the changing nature of the relationship between occupational mobility and neighbourhood deprivation as a range of individual level control variables are added. All models include the 1991 I.E. scores of individuals to control for the base level ISEI score. The negative parameters of the ISEI 1991 variables shows that the higher the ISEI score of an individual in 1991, the less upward mobility took place between 1991 and 2001. This is the well-known ceiling effect in occupational mobility. From model 1 it is clear that as level of neighbourhood deprivation increases, the level of occupational progression between 1991 and 2001 falls. An individual who lived in the most deprived quintile in 1991 (quintile 5) scores 4.13 points less on the ISEI scale

¹ The models were also run using CATTs as neighbourhoods instead of OAs but no substantive differences were identified in the regression coefficients so for brevity we present the results for the OAs only.

Table 1 Descriptive Statistics for the modelled variables (percentages)

	OAS N=52,872	CATTS N=52,872
Neighbourhood deprivation (reference = least)	23.69	22.90
2nd quintile	23.24	22.54
3rd quintile	21.62	21.19
4th quintile	18.75	19.71
5th quintile	12.69	13.65
Urban or rural (reference large city)	37.36	37.36
Urban area	32.30	32.30
Small town	10.76	10.76
Remote town	2.77	2.77
Rural area	12.57	12.57
Remote area	4.24	4.24
Individual education 1991 (reference none)	77.06	
No degree	11.92	
Degree	9.04	
None stated	1.99	
Tenure of household in 1991 (reference social renter)	24.77	
Owner	69.66	
Private renter	5.58	
Female (reference male)	47.98	
Ethnicity (reference majority ethnic)	0.42	
Household composition (reference Couple 91 & 01)	74.72	
Single 91 & 01	4.64	
Single, couple	3.62	
Couple, single	17.02	
Children (reference Children 91 & 01)	25.70	
No children 91 & 01	34.81	
No child, child	16.08	
Child, no child	23.41	
Limiting Long term illness (ref none)	92.93	
LLTI 91 & 01	0.68	
LLTI 91	0.95	
LLTI 01	5.44	
Partner works	56.23	
	Mean	
ISEI 1991	41.26	
Age	37	

Calculations done by the authors using data from the SLS

compared to someone living in the least deprived neighbourhoods (quintile 1, the reference category).

Table 2 Regression models of the change in ISEI scores between 1991 and 2001 at the Output Area level (models for the full population)

	Model 1			Model 2			Model 3			Model 4		
	coeff	se ^a	sig	coeff	se ^a	sig	coeff	se ^a	sig	coeff	se ^a	sig
ISEI 1991	-0.31	0.00	***	-0.32	0.00	***	-0.40	0.00	***	-0.41	0.00	***
Neighbourhood deprivation (reference=least)												
2nd quintile	-1.50	0.12	***	-1.44	0.12	***	-1.13	0.11	***	-1.10	0.11	***
3rd quintile	-2.65	0.12	***	-2.69	0.12	***	-2.13	0.12	***	-1.83	0.12	***
4th quintile	-3.49	0.12	***	-3.68	0.12	***	-2.95	0.12	***	-2.35	0.13	***
5th quintile	-4.13	0.13	***	-4.60	0.13	***	-3.76	0.13	***	-2.79	0.14	***
Urban or rural (reference large city)												
Urban area				-0.92	0.09	***	-0.66	0.09	***	-0.64	0.09	***
Small town				-1.17	0.13	***	-0.98	0.13	***	-0.84	0.13	***
Remote town				-1.70	0.22	***	-1.56	0.22	***	-1.34	0.22	***
Rural area				-1.52	0.12	***	-1.45	0.12	***	-1.28	0.12	***
Remote area				-2.32	0.18	***	-2.40	0.18	***	-2.14	0.18	***
Individual education 1991 (reference none)												
No degree							4.84	0.13	***	4.75	0.13	***
Degree							8.41	0.16	***	8.18	0.17	***
None stated							-0.20	0.24		-0.29	0.24	
Tenure of household in 1991 (reference social renter)												
Owner										2.11	0.10	***
Private renter										0.57	0.18	***
Female (reference male)										0.12	0.07	
Ethnicity (reference majority ethnic)										-0.71	0.48	
Age										-0.12	0.00	***
Household composition (reference couple 91 & 01)												
Single 91 & 01										0.11	0.15	
Single, couple										0.75	0.22	***
Couple, single										0.13	0.09	
Children (Children 91 & 01)												
No children 91 & 01										0.98	0.11	***
No child, child										0.15	0.14	
Child, no child										0.72	0.12	***
Limiting long term illness (ref none)												
LLTI 91 & 01										-0.70	0.16	***
LLTI 91										-0.68	0.29	**
LLTI 01										-1.12	0.10	***
Partner works										-0.53	0.10	***
Constant	16.42	0.16	***	17.57	0.18	***	19.04	0.18	***	22.02	0.26	***

Calculations done by the authors using data from the SLS

^a Robust standard errors adjusted for clustering at the OA level

* $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

The second model in Table 2 includes controls for job access using the urban to rural classification as a proxy. The inclusion of this variable *increases* the apparent disadvantage associated with living in deprived neighbourhoods, for all but the second quintile. The results show that those in the largest cities in Scotland improve occupational status the most between 1991 and 2001 and those living in rural Scottish areas the least. In model 3 we also include level of education as measured in 1991. As expected there are large occupational mobility gains for individuals if they have completed a degree. Including education in the model slightly lowers the parameters of the neighbourhood deprivation dummies, demonstrating that individual education can go some way to mitigate the apparent effects area disadvantage. Model 4 includes the full range of individual controls available in the data that we expect to be associated with occupational mobility. We see that owner occupiers in 1991 experience greater gains in occupational status between 1991 and 2001 than individuals living in either private renting or social renting. In terms of predicting occupational mobility, neither gender nor ethnicity are significant factors. In terms of household composition, individuals who formed a couple between 1991 and 2001, and those without children in both years are likely to experience the highest increase in ISEI scores between 1991 and 2001. As expected, individuals suffering from a form of long term illness in either 1991 or 2001 do not experience increases in ISEI scores between 1991 and 2001, even if their health improved between the two time points. Finally, individuals with working partners experience a slight decrease in ISEI score between the two time periods. Once individual and household characteristics are controlled for, the magnitude of the coefficients for neighbourhood deprivation have reduced substantially, but remain qualitatively similar. The results suggest that there is still a substantial and significant disadvantage for individuals living in the most deprived neighbourhoods in 1991. On the basis of the results from this set of models it would be easy to conclude that living in a deprived neighbourhood leads to disadvantage in terms of achieving occupational mobility between 1991 and 2001. However, it is likely that (unmeasured) factors influencing the selection process into the most deprived neighbourhoods also affect people's ability to achieve upward occupational mobility.

Tenure Split Models

As was outlined in the literature review, one substantial critique of the current neighbourhood effects literature is that models are presented for the full population, so that only average level population effects are discussed (see also Small and Fieldman 2012). Second, as a number of authors have highlighted, the routes through which different groups access neighbourhoods could be important (Oreopoulos 2003; Manley and van Ham 2012). Those with greater levels of resources are able to select better neighbourhoods to live in than those with fewer resources. In recognition that that sub-groups within the population may be affected differently by the neighbourhood context we modelled the outcomes presented in Table 2 stratifying by age, gender, social class, and housing tenure. Of the four split groups used, the only significant differences in occupational mobility were identified for housing tenure groups. The results for these models are presented in Table 3. We do not present step-wise models here, but the outcomes of the models containing only neighbourhood deprivation are qualitatively similar to the models presented in Table 3. Also as before, models were run at both the

Table 3 Regression models of the change in ISEI scores between 1991 and 2001 at the Output Area level (models by tenure)

	Social renters			Private renters			Owner occupiers		
	coeff	s e ^a	sig	coeff	s e ^a	sig	coeff	s e ^a	sig
ISEI 1991	-0.42	0.01	***	-0.41	0.01	***	-0.40	0.00	***
Neighbourhood deprivation (reference = least)									
2nd quintile	0.23	0.60		-0.29	0.45		-1.14	0.12	***
3rd quintile	-0.16	0.58		-0.32	0.46		-2.01	0.13	***
4th quintile	-0.34	0.57		-1.34	0.60	**	-2.68	0.16	***
5th quintile	-0.72	0.58		-2.52	0.74	***	-3.08	0.20	***
Urban or rural (reference large city)									
Urban area	-0.43	0.16	***	-1.97	0.52	***	-0.62	0.11	***
Small town	-0.18	0.22		-2.03	0.79	***	-1.03	0.16	***
Remote town	-0.92	0.34	***	-2.43	0.98	***	-1.44	0.31	***
Rural area	-0.41	0.24	*	-3.22	0.49	***	-1.27	0.15	***
Remote area	-1.18	0.38	***	-3.24	0.54	***	-2.29	0.22	***
Individual education 1991 (reference none)									
No degree	5.53	0.41	***	4.86	0.60	***	4.59	0.15	***
Degree	10.54	0.76	***	8.44	0.69	***	7.92	0.18	***
None stated	-0.33	0.38		-0.47	1.00		-0.24	0.32	
Female (reference male)	0.21	0.13		1.67	0.34	***	-0.04	0.09	
Ethnicity (reference majority ethnic)	0.77	1.60		-0.35	2.30		-1.15	0.51	**
Age	-0.11	0.01	***	-0.13	0.02	***	-0.12	0.01	***
Household composition (reference Couple 91 & 01)									
Single 91 & 01	-0.23	0.22		-0.22	0.55		0.40	0.21	*
Single, couple	0.72	0.37	**	-0.58	0.68		1.01	0.31	***
Couple, single	-0.12	0.15		-0.15	0.42		0.26	0.12	**
Children (Children 91 & 01)									
No children 91 & 01	1.15	0.20	***	1.50	0.46	***	0.81	0.14	***
No child, child	0.46	0.26	*	0.51	0.55		-0.02	0.18	
Child, no child	0.67	0.21	***	1.56	0.58	***	0.65	0.15	***
Limiting long term illness (ref none)									
LLTI 91 & 01	-0.69	0.22	***	-1.25	0.78		-0.66	0.23	***
LLTI 91	-0.89	0.45	**	-0.91	1.43		-0.51	0.40	
LLTI 01	-1.27	0.16	***	-0.50	0.46		-1.07	0.13	***
Partner works	0.09	0.17		-1.40	0.50	***	-0.74	0.13	***
Constant	19.43	0.69	***	23.06	1.04	***	24.63	0.31	***

Calculations done by the authors using data from the SLS

^a Robust standard errors adjusted for clustering at the OA level

* $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$

OA and CATT level but as there were very slight differences between the coefficients only OA models are presented below.

We found no significant disadvantage for social renters living in deprived neighbourhoods. In contrast, owner occupiers who live in deprived neighbourhoods experience much less occupational mobility than those living in the least deprived neighbourhoods. Private renters take a position between social renters and owner occupiers with only living in the most deprived neighbourhoods being associated with disadvantage. The other control variables give similar results compared to the models for the full population, with little difference between tenure groups, although the magnitude of the effects are amplified in some cases, such as education: having a degree is more important for social renters (increase in ISEI score of 10.54) than for owner-occupiers (increase of 7.92).

The results in Table 3 show important differences in the relationship between living in a deprived neighbourhood and occupational mobility for those in different housing tenures. As Small and Fieldman (2012) noted it is important to move beyond population average models and investigate subgroups to better understand how places and people interact. Surprisingly, we found the strongest negative effects of living in a deprived neighbourhood for owner occupiers. From the neighbourhood effects literature, this is not a logical finding as it is normally assumed that especially social renters experience the negative effects of, for example, negative socialisation and neighbourhood stigmatisation in deprived neighbourhoods. A possible cause for our findings is the different neighbourhood selection mechanism for different housing tenures (see for instance Oreopoulos 2003; van Ham and Manley 2010; and Manley and van Ham 2012). In this study we used housing tenure data recorded in the 1991 Census. Prior to 1991 those applying to social housing had limited say regarding the property, or location of that property, to which they were allocated (see Manley and van Ham 2011). Housing allocation was not perfectly random, but those at the top of the waiting lists were allocated to the next available dwelling that matched their needs. Conversely, those who searched for housing on the owner-occupied market, and to a lesser extent the private rental market, could choose a dwelling and neighbourhood which matched their preferences within their budgetary constraints. There are a number of studies showing the structured nature of neighbourhood choice by households (Schelling 1969; Clark 1991; Hedman et al. 2011) but they concur with the findings presented here and the explanation advanced. If neighbourhood selection can take place for owner occupiers and not for social renters, then the apparent causal relationship between neighbourhood deprivation and individual changes in ISEI scores could be caused by similar individuals clustering together in neighbourhoods. In other words, those owner occupiers who are most likely to achieve occupational mobility between 1991 and 2001 are also the least likely to live in deprived neighbourhoods. In contrast, those individual who are less likely to achieve high levels of occupational mobility are the most likely to live in a deprived neighbourhood.

Discussion

The main contribution of this paper is that we have shown that it is important to move beyond the standard global population quantitative models in neighbourhood effects research. Most studies model the effect of neighbourhood characteristics for the whole

population without asking the question whether the neighbourhood is more important for some than for others. A full population model might show evidence of neighbourhood effects while in reality these effects might be absent for some sub-groups and strong for others. By modelling neighbourhood effects for sub-groups we may uncover differential effects. This is particularly important when there are different mechanisms underlying the routes through which individuals enter and leave neighbourhoods.

In our analyses we found associations between neighbourhood characteristics and occupational mobility for home owners, but not for social renters. Home owners living in the most deprived neighbourhoods are less likely to experience occupational mobility than home owners living in the least deprived neighbourhoods. This finding suggests that there are selection mechanisms at play: those home owners who are the least likely to experience occupational mobility sort into the most deprived neighbourhoods. An underlying selection mechanism might be that mortgage lenders are less likely to lend money to individuals with few labour market prospects, and as a result these home owners buy houses at the lower end of the owner occupied market, often ending up in the most deprived neighbourhoods. Social renters on the other hand, especially in the early 1990s in the UK, were allocated dwellings and therefore neighbourhoods, and as a result there was less selective sorting.

The findings point to a selection effect and not causation as the mechanism underling the apparent 'effect' of neighbourhood deprivation on occupational mobility in Scotland. So your life chances affect where you live and not the other way around. This, in conjunction with the finding that neighbourhood effects are not present for social renters, highlights that selective mobility into different neighbourhoods by individuals and households is very important for our understanding of how neighbourhood effects work. In light of our findings we suggest that many studies claiming to have found evidence of neighbourhood effects only found selection effects. That where you live has an important relationship with individual outcomes is not disputed, and also the notion of spatial inequalities and socio-economic segregation is very important. Indeed, the very importance of the subject makes it vital that we understand more fully how place, people and outcomes interact. Reporting correlations between place, people and outcomes is not sufficient and could lead, ironically, to further stigmatisation, inappropriately targeted policies that displace individuals without improving their life chances in the name of neighbourhood regeneration and widening inequalities.

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