

METHODS BRIEFING 14

The Impact of Local Area Influences on Individual Outcomes

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The question of whether neighbourhood influences social outcomes, for example voting, mental health, income, poverty and employment, is of great importance in making decisions about policy interventions and also in understanding processes. However, there are a number of methodological issues that come into play when trying to measure impact of neighbourhood. These include:

- The spatial scale at which neighbourhood effects operate
- Heterogeneity in responses to neighbourhood conditions
- Differentiating the current correlation of individual outcomes with neighbourhood from the impact of neighbourhood on future life chances.
- The complex nature of individual membership of households and neighbourhoods over time
- Endogeneity of neighbourhood. Many though not all of the research questions in this field relate to the impact of place on outcomes. One of the key methodological issues in observational data is trying to distinguish this causal hypothesis from clustering – the simple grouping together in space of people with

similar incomes. This happens straightforwardly through the housing market, and the correlation of income with so many characteristics.

Our research is cross-disciplinary and makes both methodological and substantive contributions. Our analyses use the British Household Panel Survey (BHPS), augmented by a set of differentially scaled ‘bespoke neighbourhoods’ for every respondent. Unusually, we can also explore definitions of neighbourhood at different geographical scales – from the very small (the nearest few streets) to the much larger (10,000 people). This is useful because theory does not give much guidance on what the appropriate scale is, and there is no reason to believe that it is the same for all processes.

Methodological issues common to all the topics:

- Dependencies arising from structures which can occur naturally and by design in surveys. ‘Naturally’ occurring dependencies in the BHPS include individuals in households and measurements

over time; ‘imposed-by-design’ dependencies include the multistage sample initially used to draw the original sample. ‘Missingness’ or imbalance also occurs naturally and by design.

a) Voting and Political Attitudes

- The BHPS combines three types of structure: strict hierarchies, cross-classifications and multiple memberships. As an example, we have focused on the underlying and changing dimensions of political attitudes, how these change across time and between places, and the extent that this is differential according to individual class. We have analysed the resulting complex classification by Bayesian probability modelling in which parameters and observations are treated as random variables.

Our results provide strong evidence that voting patterns in Great Britain are consistent with neighbourhood effects. We have:

- Analysed the strength of the neighbourhood effect each year over a decade during which there was considerable political change in Britain. We showed that the spatial polarisation of the electorate, consistent with the neighbourhood effect, varied over time, being substantially stronger at the beginning and end of the period;
- Identified patterns consistent with the neighbourhood effect operating at several spatial scales;
- Introduced a new level to the analysis of voting patterns. The BHPS allows analysis – for the first time in the UK – on the degree of intra-household agreement in voting not only at individual elections but also of changing patterns between elections;
- Decomposed the well-established regional effect in British voting patterns, by incorporating neighbourhood voting patterns, and clarifying the existence of spatial variations at several scales;
- Analysed differentials in the strength of the neighbourhood effect by individual survey

respondents, using BHPS questions to categorise respondents according to their level of ‘neighbourhood social capital’. The effect was much stronger the greater the respondents’ degree of neighbourhood involvement.

- Used a model with 512 constituencies, some 7000 dynamically-defined households, and over 14000 people with a total of 6 attitudes measured on a total of over 47,000 occasions to show that household effects were of considerable importance; there is considerable ‘churning’ in political attitudes over time; there appears evidence for substantial neighbourhood effects in political attitudes even when account was taken of a range of individual and household characteristics.
- Used the BHPS data to explore ‘economic voting’. After allowing for an important endogeneity effect (people who voted for the government at one election are more likely to feel optimistic about its economic performance thereafter), we find no convincing evidence to support the ‘economic voting’ hypothesis.

b) Income Dynamics

We examined the long-term income trajectories of people living in different micro neighbourhoods in Britain. Our aim was to test whether the data are consistent with any influence of neighbourhood while making as few parametric assumptions as possible, and no exclusion restrictions. Our results are not consistent with a substantial detrimental neighbourhood effect. We find a strong negative contemporaneous correlation between the level of income and the disadvantage of the neighbourhood. Thus at least one of two mechanisms – causality or sorting – is working to generate this pattern. But we find no evidence of a negative relationship between neighbourhood and subsequent income growth. This is true for one-year, five-year and ten-year changes, for almost all population groups, and at different parts of the income growth distribution. The modelling framework highlights the role of two factors in interpreting neighbourhood influences – the dynamic adjustment of income and the nature

of the housing finance system, particularly in responding to temporary income shocks.

We have also focussed on social renters as a special group. They are of interest in their own right, but also they often have a very restricted choice of local neighbourhood. We use this institutional set-up as one way of dealing with endogeneity of neighbourhood, using a treatment effect approach. That is to say, the location of social renters is less influenced by choice and more by administrative rules. Our results from this analysis support the national study just described – it is hard to find any evidence for important, causal detrimental neighbourhood effects.

c) *Mental Health*

We examined the impact of neighbourhood on levels and changes in mental health, allowing for the hierarchical structure of the data, different aspects of neighbourhood, and differential responses across individuals. We find the extent of association between neighbourhood and both levels and changes in mental health is very limited. There is some evidence of interaction between neighbourhood characteristics and gender and ethnicity for levels of mental health. What appears to be important for levels of common mental disorders are the observed characteristics of individuals and their households, not of place. We also study social renters in this context too, with similar results.

d) *Employment*

We investigated whether there are “neighbourhood effects” on employment or joblessness. The results show that these peer or network effects are apparent at the extremes. There is no effect of local unemployment on the average propensity to be in work, but there is an effect at higher quantiles. There are also some interesting differences by occupation: these effects are mostly apparent for unskilled manual workers. They are also stronger for individuals who report stronger links to their local neighbourhood. We use the same sort of

techniques as described above, though the focus on a discrete variable (employed or not) forces us to use appropriate methods.

Methodological contributions

We have focused on methods to deal with sources of complexity. These analyses have taken place in the context of our analysis of voting, discussed above. We have been interested in the influence of multiple levels on voting behaviour. This has forced consideration of:

- **Categorical outcomes.** We used a simulation approach to analyse the 1997 general election in England to reveal the relative importance of region, constituency, neighbourhood and individual variation.
- **Analysis of categorical outcomes when there is high dependency and few lower level units in each of the higher level units, using finite mixture modelling.**

Key publications from the project include:

- Bolster, A, Burgess, S, Johnston, RJ, Jones, K, Propper, C, and Sarker, R. (2004) Neighbourhoods, Households and Income Dynamics: A semi-parametric investigation of Neighbourhood Effects. *CMPO DP 04/106*.
- Bolster, A, Burgess, S, Johnston, RJ, Jones, K, Propper, C, and Sarker, R. (2005) Joblessness and Employment Networks. *Mimeo, in preparation*.
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- Johnston, R J, Jones, K, Propper, C, Sarker, R, Burgess, S and Bolster, A, (2005a) A missing level in the analysis of British voting behaviour: the household as context as shown by analyses of a 1992-1997 longitudinal survey. *Electoral Studies* 24 (ISSN 0261-3794), 2005, 201-225.

- Johnston, R J, Jones, K, Sarker, R, Propper, C, Burgess S and Bolster A, (2004a) Party support and the neighbourhood effect: spatial polarisation of the British electorate, 1991-2001. *Political Geography* 23 (ISSN 0962-6298), 2004, 367-402.
- Johnston, R J, Propper, C, Sarker, R, Jones, K, Bolster A and Burgess, S (2005c) Neighbourhood social capital and neighbourhood effects. *Environment and Planning A: 37*
- Johnston, R J, Propper, C, Burgess, S, Sarker, R, Bolster A and Jones, K, (2005b) Spatial scale and the neighbourhood effect: multinomial models of voting at two recent British general elections. *British Journal of Political Science* (ISSN 0007-1234) 35, 2005: 487-514.
- Johnston, R J, Sarker, R, Jones, K, Bolster, A, Propper C and Burgess, S, (2005d) Egocentric economic voting and changes in party choice: Great Britain, 1992-2001. *Journal of Elections, Political Opinion and Parties* 1, 2005 (ISBN 1745-7289), 129-144.
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- Jones, K, Bolster, A, Burgess, S, Johnston, R J, Propper, C, and Sarker, R (2004) Realistically complex modelling of the British Household Panel Survey using MCMC multilevel models. *Mimeo*
- Propper, C, Jones, K, Bolster, A, Burgess, S, Johnston RJ, and Sarker, R (2005) Local Neighbourhood and Mental Health: Evidence from the UK. *Social Sciences and Medicine*, forthcoming.

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