RESEARCH FINDINGS December 2009

# EXPLORING GEOGRAPHIES OF HAPPINESS AND WELL-BEING

*Dimitris Ballas*
Department of Geography, University of Sheffield

In recent years there have been numerous attempts to define, measure and analyse happiness in various contexts and pertaining to a wide range of disciplines, ranging from neuroscience to economics (e.g. Dolan *et al.*, 2007; Huppert *et al.*, 2005; Layard, 2005; Oswald, 1997). Most of the quantitative research on happiness to date are based on statistical models which have been very successful in identifying what are the key socio-economic and demographic determinants of subjective happiness. Most are built using survey data about individuals and households to make inferences about an individual level relationship between happiness and a wide range of socio-economic and demographic characteristics.

Whilst there have also been studies that compare aggregate levels of subjective happiness and well-being measures between countries, there are few studies that attempt to explore the socio-economic and geographical dimensions of happiness simultaneously and to take different levels (e.g. individual, household, socio-economic grouping, neighbourhood, district, nation) into account at the same time. Furthermore, few attempts try to measure or estimate happiness at the small area level.

This research project aimed to critically review past studies and theories of happiness and to add a geographical dimension to recent innovative work of social scientists. In particular, amongst the key objectives of the project were to analyse secondary survey data in order to determine what are the factors and life events increase or decrease the level of well-being of different types of individuals (Ballas and Dorling, 2007) and to then explore the geographical distribution of subjective happiness and well-being using appropriate statistical modelling methods (Ballas and Tranmer, 2009; Ballas, 2009).

## Key Findings

Key findings are as follows:

- Secondary data analysis of self-reported happiness and major life event data can provide an initial suggestion of which dynamic events appear to matter most in people's lives and some measure of to whom and where those events are most likely to occur.
- At the end of the 20th century, personal relationships were extremely important in terms of happiness, surpassing the importance of relationships at work on individual well-being. Births and deaths as well as health and employment-related events, also appear to have a considerable effect on happiness. In contrast, events such as 'going on holiday' or 'buying a pet' do not seem to have any significant consistent impact on happiness.
- Survey respondents who lived in their current address for more than five years reported higher than average subjective well-being.
- Multilevel modelling methods show that most of the variation in happiness and well-being is attributable to the individual level, but some variation in these measures is also found at the household and area levels, especially for the measure of well-being, before we control for the full set of individual, household and area characteristics.
- Analysis of combined data from the Census and the BHPS in 1991, before controlling for explanatory factors, indicates that Wycombe was the district with the highest well-being whereas the district with the lowest feelings of well-being was Bracknell Forest, Slough.

- Analysis of individual, household and district BHPS data in 2003, before controlling for explanatory factors, suggests that the area with the lowest estimated well-being levels was Cynon Valley and Rhondda followed by Merthyr Tydfil, Rhymney Valley and Taff-Ely.

- Once we control for a full set of individual, household and area characteristics, the variation in happiness and well-being is not found to be statistically significant between areas.

## Study aims, data sets and methods

Five main objectives were formulated and achieved. The first aim was to conduct an extensive review of different definitions and theories of happiness. This review highlighted the need to build on the very successful modelling frameworks that have been developed by economists and psychologists by examining the possible social and spatial inequalities that may be affecting happiness.

Secondly, secondary data from the British Household Panel Survey (BHPS) were analysed in order to determine what are the factors and life events increase or decrease the level of well-being of different types of individuals. Regression models have been applied in order to examine the factors and life events that may increase or decrease the level of well-being of different types of individuals.

Thirdly, a geographical dimension to existing happiness research has been added by combining the BHPS with spatial data from the population census using multi-level and spatial microsimulation models.

Fourthly, multilevel models of subjective happiness and well-being were developed and used to examine the extent to which happy or unhappy people congregate in similar locations (compositional effects) or whether certain attributes of places cause its inhabitants to be happy or unhappy (contextual effects).

The final part of the research project involved the development of spatial microsimulation models of subjective happiness and well-being in order to estimate happiness and well-being for geographical levels for which there is no information from published sources, as well as to project the spatial distribution of happiness into the future.

## The geography of happiness and well-being

The initial survey of different measurements of happiness and of the determinants of subjective happiness and well-being highlighted the need examine the possible social and spatial inequalities that may be affecting happiness using the BHPS. Happiness data were cross-tabulated against 'social class' and 'region' and the analysis of these tables suggested that different places may suit different groups worst or better: skilled appear least unhappy in Inner London, unskilled in Tyne and Wear and the professional and managerial occupations seem to be most at ease in rural Yorkshire and Humberside (Table 1). A more detailed discussion of these results appears in Ballas *et al.*, 2007).

| Region by social class | Class 1 | Class 2 | Class 3 | Classes 1-3 | N |
|---|---|---|---|---|---|
| Rest of Yorks & Humberside | 3.3 | 7.1 | 7.0 | 5.9 | 328 |
| Tyne & Wear | 10.0 | 7.1 | 3.4 | 7.2 | 264 |
| East Midlands | 5.3 | 8.1 | 11.2 | 7.9 | 782 |
| Inner London | 10.3 | 5.2 | 8.8 | 7.9 | 418 |
| Rest of North West | 4.9 | 9.2 | 12.3 | 8.5 | 454 |
| South West | 11.7 | 6.7 | 8.9 | 8.7 | 930 |
| Scotland | 11.3 | 7.95 | 7.8 | 9.0 | 957 |
| Greater Manchester | 14.5 | 8.2 | 4.8 | 9.3 | 416 |
| West Midlands Conurbation | 10.5 | 8.9 | 8.8 | 9.3 | 453 |
| East Anglia | 10.7 | 6.5 | 13.3 | 9.5 | 390 |
| Merseyside | 17.6 | 9.2 | 0.0 | 9.5 | 233 |
| West Yorkshire | 14.5 | 7.7 | 9.6 | 10.2 | 364 |
| Rest of South East | 10.5 | 10.8 | 8.7 | 10.3 | 1,875 |
| Outer London | 8.9 | 13.3 | 6.9 | 10.7 | 668 |
| Rest of West Midlands | 8.9 | 11.6 | 14.9 | 11.5 | 506 |
| Rest of North | 19.7 | 10.4 | 8.5 | 12.4 | 400 |
| Wales | 11.1 | 12.9 | 15.3 | 13.0 | 533 |
| South Yorkshire | 17.6 | 11.6 | 24.2 | 15.4 | 293 |
| Great Britain | 10.5 | 9.3 | 9.7 | 9.8 | 10,264 |

**TABLE 1. THE PERCENTAGE OF INDIVIDUALS (BY SOCIAL CLASS) IN THE FIRST WAVE OF BHPS WHO ANSWERED THAT THEY WERE "LESS HAPPY OR MUCH LESS SO"TO THE BHPS QUESTION "HAVE YOU RECENTLY BEEN FEELING REASONABLY HAPPY, ALL THINGS CONSIDERED?"**

Class 1 comprises Professional and managerial & technical occupations, Class 2 comprises Skilled non-manual and manual occupations and Class 3 comprises Partly-skilled and unskilled occupations.

## The impact of major life events upon happiness

'Major Life Events' data were derived from the BHPS question "*State in your own words what in the last year has happened to you (or your family) which stood out as important*" and were coded as 80 types of event that were placed into the following categories: Health related events, Education, Employment, Leisure, Births and Deaths, Relationships, Finance and Other. In addition, each of these events related to 21 possible subjects. Different combinations of Major Life Events and 'Event Subjects' have been explored in order to define a smaller number of more meaningful and 'statistically manageable' events (Ballas and Dorling, 2007).

The effect of Major Life Events upon happiness were evaluated using Ordinary Least Squares (OLS) multivariate regression. Table 2 shows the results of the analysis (listing the life event regression coefficients in ascending order). High negative values imply an association of the event with unhappiness, whereas high positive values indicate that an event has an association with happiness.

| Life event | Coefficient | P value* |
|---|---|---|
| Relationships (Mine** Ending 36,43***) | -0.178 | 0.00 |
| Death (Parent, 45) | -0.166 | 0.00 |
| Health** (Parent (1-9) | -0.139 | 0.00 |
| Death (Other 45) | -0.137 | 0.00 |
| Employment (Job loss 24) | -0.129 | 0.00 |
| Health Mine (1-9) | -0.117 | 0.00 |
| Death (Family 45) | -0.098 | 0.00 |
| Health Partner (1-9) | -0.092 | 0.00 |
| Health Child (1-9) | -0.084 | 0.00 |
| Health Other (1-9) | -0.073 | 0.00 |
| Education Child (12-19) | -0.029 | 0.12 |
| Employment Other (23; 26-29) | -0.028 | 0.13 |
| Other event (10-11; 32-34; 37-39; 90-95) | -0.026 | 0.14 |
| Nothing important happened | -0.022 | 0.11 |
| Relationships (Pet ownership/ Companionship 54) | -0.020 | 0.44 |
| Finance (Other 60-69; 73-79) | -0.019 | 0.27 |
| Relationships Family (46-53; 55-59) | -0.014 | 0.39 |
| Relationships (Family 35; 41-42) | 0.002 | 0.91 |
| Leisure (Our holiday 30) | 0.010 | 0.61 |
| Moving home (44; 80-81) | 0.013 | 0.46 |
| Education Other (12-19) | 0.024 | 0.27 |
| Finance (Car 70) | 0.027 | 0.22 |
| Leisure (My holiday 30) | 0.029 | 0.07 |
| Pregnancy/Birth (Other 40) | 0.031 | 0.56 |
| Pregnancy/Birth (Family 40) | 0.034 | 0.09 |
| Relationships (Child's starting 35; 42) | 0.037 | 0.10 |
| Employment (Job change 20-21) | 0.040 | 0.02 |
| Leisure (Other 30-31) | 0.043 | 0.02 |
| Education Mine (12-19) | 0.052 | 0.00 |
| Pregnancy/Birth (Child's 40) | 0.053 | 0.01 |
| Pregnancy/Birth (Mine 40) | 0.084 | 0.00 |
| Finance (House 71) | 0.097 | 0.00 |
| Employment (Job gain 22) | 0.097 | 0.00 |
| Relationships (Mine starting 35; 42) | 0.160 | 0.00 |

**TABLE 2. OLS REGRESSION EQUATION OF SUBJECTIVE HAPPINESS AND MAJOR LIFE EVENTS**

BHPS waves 1992-1995 (pooled and weighted on the basis of the 1995 cross-sectional weights; note that the value of the constant is 2.25) — after Ballas and Dorling (2007).

* 0.00 means less than 0.005.

** See Appendix in Ballas and Dorling (2007) for a detailed description of all subject and event codes.

*** Health-related events include 'negative' (e.g. injury) as well as 'positive' events (e.g. recovery, positive test results); the same applies to many of the other variables listed here.

## Happy people or happy places?

Multilevel models of subjective happiness and well-being were developed, combining secondary data from the BHPS and UK Census. These models were then used to examine the extent to which happy or unhappy people congregate in similar locations (compositional effects) or whether certain attributes of places cause their inhabitants to be happy or unhappy (contextual effects). Table 3 shows the results of one of the multilevel models (for more details, see Ballas and Tranmer, 2009).

The following variables have significant negative main effects on happiness and well-being: age, gender (females tend to be on average less happy than males), health status, unemployment, being a family carer, and being sick or disabled. Also, commuting times seem to have a negative but not significant effect on well-being and happiness in this model. On the other hand, being in a relationship without children seems to have a positive significant effect on both measures (when compared with being single).

Overall, the multilevel modelling results were widely consistent with the findings of previous happiness studies. Nevertheless, it is noteworthy that one of the variables used here that has not been examined in detail by other studies is 'Length of time in current address'. In particular, according to this analysis, sample respondents who lived in their current address for more than five years reported higher than average subjective well-being.

It is also interesting to note that the unemployment interaction term has a significant positive effect on both 'subjective well-being' and 'happiness'. This finding is consistent with some of the past relevant studies (Clark, 2003; Powdthavee, 2007), suggesting that unemployment hurts, but it hurts less when there are more unemployed people around.

It should be noted that before the introduction of the explanatory variables described in Table 3, the variation of well-being that is attributable to district and household levels was 1% and 14% respectively, with the remaining 85% of the variance attributed to individual level characteristics (Ballas and Tranmer, 2009). The introduction of explanatory and control variables reduced this variance considerably. Figure 1 shows what is known as a 'caterpillar plot' of the district level residuals (based on 1991 data) before any explanatory variables are introduced. There are 162 district level residuals plotted, one for each metropolitan district for data was available.

Looking at the confidence intervals (calculated using 1.4 times the standard deviation for each district) around the districts, there are only four districts where these intervals do not overlap zero. In particular, there are three such districts on the left hand side of the plot: Wakefield, Alyn and Deeside, Delyn and Wrexham Maelor. This means that the subjective well-being of these areas is significantly lower than the average value in the country at the 5% level.

On the other hand, the district of Wycombe on the right hand side of the plot also has a confidence interval that does not overlap zero, suggesting that this area has significantly higher than average subjective well-being at

the 5% level, prior to controlling for explanatory variables. It is also noteworthy that the confidence intervals of Wycombe do not overlap with the intervals of four of the districts on the right hand side of the plot, suggesting that the subjective well-being of Wycombe is significantly higher than that of these four areas at the 5% significance level.

Nevertheless, it should be noted that Figure 1 plots the estimated district level well-being residuals of a model that does not include any explanatory variables. Therefore, the variation at aggregate district level may arise simply from variation in the characteristics of individuals living in these districts and therefore attributed to composition and not context. It is possible to investigate this further by producing a 'caterpillar plot' of the residuals of the models with explanatory variables. Figure 2 shows this plot for the model that included the explanatory variables listed in Table 3.

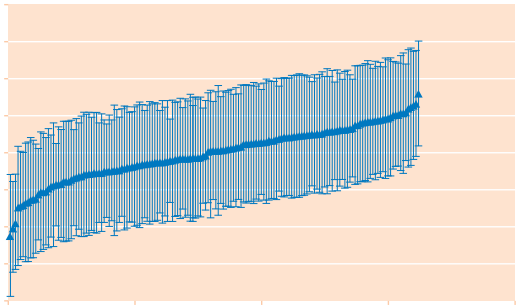

FIGURE 1. CATERPILLAR PLOT OF 'NULL MODEL' DISTRICT LEVEL RESIDUALS

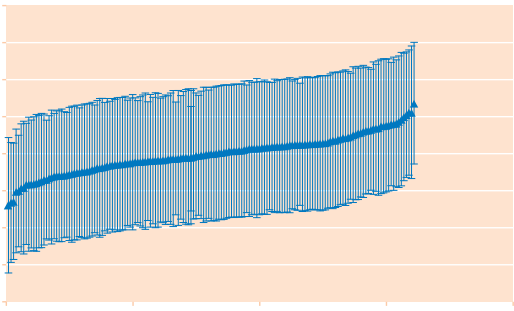

FIGURE 2. CATERPILLAR PLOT OF MODEL 2 DISTRICT LEVEL RESIDUALS

The confidence intervals of all districts overlap with zero and therefore none of the district level subjective well-being values are significantly higher or lower than the national average at the 5% significance level. This suggests that the differences described in Figure 1 can all be attributed to the explanatory variables included in model 2 (Table 3).

The same conclusion also applied with regards to all other similar fitted models that included explanatory variables. Once explanatory variables are included in all models, then the differences between districts, whilst not being estimated as exactly zero, are not statistically significant.

Whilst these non-zero differences may be essentially 'noise', it is of interest to assess whether the residuals from the models with explanatory variables have any relationship with those from the null model (for more details, see Ballas 2008a; Ballas and Tranmer, 2009).

## Estimating happiness and well-being for smaller geographical areas

The multilevel modelling results that were briefly discussed above were also used to inform decisions regarding the development of a spatial microsimulation model of happiness and well-being. Spatial microsimulation methodologies involve the merging of census and survey data to simulate a population of individuals within households, whose characteristics are as close to the real population as it is possible to estimate.

This project built on past and on-going spatial microsimulation work (Ballas *et al.*, 2005a; 2005b) by developing and using a spatial microsimulation model to define personal happiness and quantify and estimate its degree for different types of individuals, living in different areas. The model linked BHPS data to census small area statistics on the basis of socioeconomic variables such as those used in the multilevel models. The simulated database was then used to estimate subjective happiness at different geographical levels.

Figure 3 shows an example output of the microsimulation model: the estimated geographical distribution of happiness in Wales and Scotland respectively in the first simulation year of 1991, aggregated to parliamentary constituency level (for more details on the modelling results and the assumptions underpinning them see Ballas, 2008b; 2009).

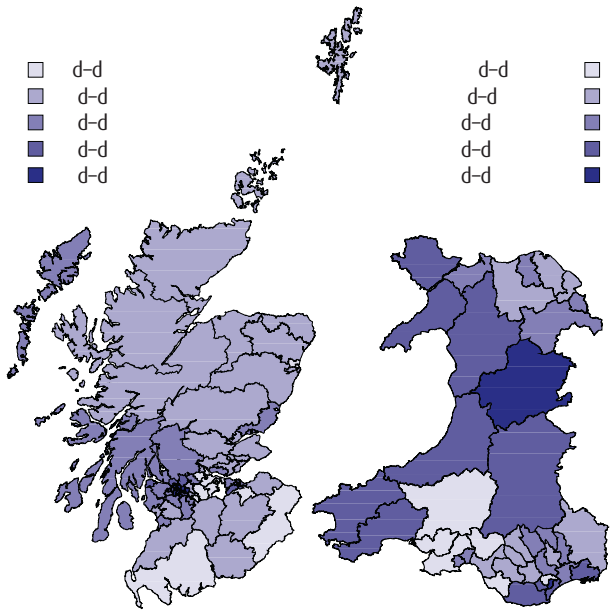


FIGURE 3. ESTIMATED GEOGRAPHICAL DISTRIBUTION OF HAPPINESS (% HAPPY MORE THAN USUAL) IN WALES AND SCOTLAND, 1991

| Model 2 explanatory variables | Subjective well-being Coefficient (Standard error) | General happiness Coefficient (Standard error) |
|---|---|---|
| **Individual-level variables** | | |
| Age | -0.016 (0.003) | -0.022 (0.003) |
| Age squared | 0.000 (0.000) | 0.000 (0.000) |
| Female | -0.177 (0.021) | -0.068 (0.023) |
| Individual income | -0.012 (0.013) | 0.007 (0.015) |
| Health good (reference = health excellent) | -0.200 (0.022) | -0.085 (0.024) |
| Health fair (reference = health excellent) | -0.510 (0.028) | -0.249 (0.031) |
| Health poor (reference = health excellent) | -0.963 (0.043) | -0.465 (0.047) |
| Health very poor (reference = health excellent) | -1.471 (0.073) | -0.790 (0.078) |
| University degree | -0.030 (0.038) | 0.079 (0.040) |
| Employment status: unemployed (reference = employed or self employed) | -0.451 (0.043) | -0.384 (0.047) |
| Employment status: retired (reference = employed or self employed) | 0.038 (0.041) | 0.030 (0.044) |
| Employment status: family care (reference = employed or self employed) | -0.126 (0.035) | -0.078 (0.038) |
| Employment status: student (reference = employed or self employed) | 0.048 (0.054) | 0.022(0.059) |
| Employment status: sick/disabled (reference = employed or self employed) | -0.458 (0.063) | -0.158 (0.069) |
| Employment status: on maternity leave (reference = employed or self employed) | 0.023 (0.258) | 0.492 (0.281) |
| Employment status: on a government scheme (reference = employed or self employed) | -0.045 (0.153) | -0.274 (0.167) |
| Employment status: other job status (reference = employed or self employed) | 0.082 (0.161) | 0.163 (0.176) |
| Commuting time: up to 40 minutes | 0.012 (0.032) | 0.040 (0.034) |
| Commuting time: between 40 – 60 minutes | -0.048 (0.044) | 0.024 (0.047) |
| Commuting time: over an hour | -0.087 (0.072) | -0.051(0.078) |
| Has lived at current address for between 1-5 years (reference = lived at current address for less than 1 year) | 0.027(0.032) | -0.010(0.034) |
| Has lived at current address for more than 5 years (reference = lived at current address for less than 1 year) | 0.120(0.031) | 0.030(0.033) |
| **Household level variables** | | |
| Household type: couple no children (reference = single) | 0.117 (0.034) | 0.144 (0.036) |
| Household type: couple with dependent children (reference = single) | -0.030 (0.034) | 0.047 (0.041) |
| Household type: couple with children but not dependent (reference = single) | 0.037 (0.046) | 0.078 (0.049) |
| Household type: lone parent with dependent child(ren) | -0.281 (0.058) | -0.092 (0.062) |
| Household type: lone parent with non dependent child(ren) | -0.051(0.060) | 0.067(0.063) |
| Household type: other | 0.098 (0.059) | 0.176 (0.064) |
| Household tenure: private renting (reference = owner occupier) | -0.054 (0.038) | 0.055(0.040) |
| Household tenure: LA/HA renting (reference = owner occupier) | -0.068 (0.028) | -0.011(0.029) |
| Number of cars | -0.010 (0.016) | 0.003 (0.016) |
| Household income | 0.028 (0.015) | 0.002 (0.016) |

**TABLE 3. MULTILEVEL MODEL OF SUBJECTIVE WELL-BEING (HLGHQ1) AND HAPPINESS (GHQL)** Source: BHPS wave 1 (after Ballas and Tranmer, 2009)

## Government policy relevance and potential impacts

As is the case with most happiness research studies to date, the methodological framework and the findings presented here can be used to inform public policy and, in particular, to identify the extent to which the quality of life and well-being in an area is attributed to the characteristics of its inhabitants or to some contextual aspect, such as the built environment, lack of green spaces, crime rates, as well as issues pertaining to the distribution of an individual attribute, such as social and spatial inequalities in income, wealth and consumption patterns.

In addition, one of the major advantages of the models that were developed in the context of this project is that that they can be used to investigate the possible impact on happiness of alternative government policies. The models are currently being used to explore the impact upon happiness of basic income policies which could increase the economic independence of all individuals in society (Van Parijs, 1997; 2001). They will also be used to examine the possible impact of innovative progressive consumption tax policies such as those suggested by Frank (2000; 2005) and to further investigate the degree to which the source of happiness or unhappiness is personal or it has more to do with inequalities in the distribution of income, wealth, skills and capability.

## References


Ballas, D. (2008a) Using multi-level modelling to understand the determinants of happiness, *NCRM Research Methods Festival 2008*, http://eprints.ncrm.ac.uk/204/

Ballas. D. (2008b) Geographical modelling of happiness and well-being, *BURISA*, 177:12-17.

Ballas, D. (2010) Geographical modelling of happiness and well-being, in Stillwell, J, Norman, P., Thomas, C. and Surridge, P. (eds.) *Spatial and Social Disparities, Understanding Population Trends and Processes, Volume 2;* Springer, Dordrecht (in press).

Ballas, D. and Dorling, D. (2007) Measuring the impact of major life events upon happiness, *International Journal of Epidemiology*, 36: 1244-1252.

Ballas, D., Dorling, D. and Shaw, M. (2007) Social inequality, health, and well-being, in Haworth, J. and Hart, G. (eds.) *Well-Being: Individual, Community, and Social Perspectives*, Palgrave, Basingstoke, pp. 163-186.

Ballas, D., Tranmer, M. (2009), *Happy people or happy places? A multilevel modelling approach to the analysis of happiness and well-being*, working paper; an earlier version is deposited at the arXiv e-print archive, http://eprintweb.org/S/article/stat/0808.1001

Clark, A. (2003) Unemployment as a social norm: Psychological evidence from panel data, *Journal of Labor Economics*, 21: 324-351.

Dolan, P., Peasgood, T. and White, M. (2007) Do we really know what makes us happy? A review of the literature on the factors associated with subjective well-being, *Journal of Economic Psychology*, doi: 10.1016/j.joep.2007.09.001

Frank, R. (1999) L*uxury Fever: Money and Happiness in an Era of Excess*, Princeton University Press, New York.

Frank, R. (2005) *Falling Behind: How Rising Inequality Harms the Middle Class*, Wildavsky Forum Series, 4.

Huppert, F.A, Baylis, N. and Keverne, B. (2005) The Science of Well-being, Oxford University Press.

Layard, R. (2005) *Happiness. Lessons from a New Science*, Penguin Books, London.

Oswald A.J. (1997), Happiness and economic performance, *Economic Journal,* 107: 1815–1831.

Powdthavee, N. (2007) Are there geographical variations in the psychological cost of unemployment in South Africa?, *Social Indicators Research*, 80(3): 629-652.

Van Parijs, P. (1997) *Real Freedom for All: What (If Anything) Can Justify Capitalism?*, Clarendon Press, Oxford.

Van Parijs, P. (ed.) (2001) *What's Wrong with a Free Lunch?*, Beacon Press, Boston, Mass.


## Other publications by the author


Ballas, D., Clarke, G. P., Dorling, D. and Rossiter, D. (2007) Using SimBritain to model the geographical impact of national government policies, *Geographical Analysis*, 39(1): 44-77.

Ballas, D., Kingston, R., Stillwell, J. and Jin, J. (2007) Building a spatial microsimulation-based planning support system for local policy making, *Environment and Planning A*, 39(10), 2482–2499.

Dorling, D., Rigby, J., Wheeler, B., Ballas, D., Thomas, B., Fahmy, E., Gordon, D. and Lupton, R. (2007) *Poverty, Wealth and Place in Britain, 1968 to 2005*, Policy Press, Bristol.

Ballas, D., Rossiter, D., Thomas, B., Clarke, G.P. and Dorling, D. (2005) *Geography Matters: Simulating the Local Impacts of National Social Policies*, Joseph Rowntree Foundation, York.

Fahmy, E., Dorling, D., Rigby, J., Wheeler, B., Ballas, D., Gordon, D., Lupton, R. (2008) Poverty, wealth and place in Britain, 1968-2005, *Radical Statistics*, 97: 11-30.

Morrissey, K., Clarke, G, Ballas, D., Hynes, S., O'Donoghue, C. (2008) Examining access to GP services in rural Ireland using microsimulation analysis, *Area*, 40: 353-364.

Rossiter, D., Ballas, D., Clarke, G.P. and Dorling, D. (2009) Dynamic spatial microsimulation using the concept of GHOSTs, *International Journal of Microsimulation*, 2(2): 15-25.


## Contact details of the author:


Dimitris Ballas,
Social and Spatial Inequalities (SASI) Group,
Department of Geography,
University of Sheffield, Sheffield S10 2TN
Email: d.ballas@sheffield.ac.uk

Web:
http://www.shef.ac.uk/geography/staff/ballas_dimitris/