

CCSRNews

The Cathie Marsh Centre for Census and Survey Research (CCSR)

Focus on
Research
Methods

CCSR provides a hub for the provision of training in social statistics and advanced quantitative methods as well as methodological research.

Methodological work is typically developed in response to research questions. Our research groups bring together both statisticians and non-statisticians; for example, the social network group has an active research agenda that links a wide range of disciplines. Survey methods, particularly methods for dealing with attrition and missing data in longitudinal data, are another important area (see page 7) as is the development of quantile regression methods for topics as different as small area estimation and analysis of the gender pay gap.

Our MSc in Social Research Methods and Statistics provides a firm grounding in advanced quantitative methods, taught within an applied social science framework. It offers relevant and marketable skills for a career in research and many of our graduates have gone on to careers in government, academia and the Office for National Statistics. The course is also recognised for PhD training by the Economic and Social Research Council and a number of our Masters' students go on to do a PhD with us. See www.ccsr.ac.uk/masters/ for a short video.



The CCSR programme of short courses offers one, two or three day courses from September through to June each year. Courses range from the basic 'Introduction to Data Analysis' to advanced courses on, for example, 'Handling Missing Data in Longitudinal Surveys' and all include a strong practical element. Details are at www.ccsr.ac.uk/courses/list/

CCSR also hosts the European Science Foundation's research network: Quantitative Methods in the Social Sciences 2. This network provides a focal point for methodological innovation and advancement. It covers five areas of critical importance in quantitative methods:

- Social interactions and social networks
- Analyzing the lifecourse
- Cross-national comparisons
- Immigration and population dynamics
- Survey design and quality

Annual seminars provide a focal point where specialists from different disciplines and different countries can share their experience, whilst summer schools disseminate advanced quantitative methods to the new generation of European researchers. For more information go to: www.ccsr.ac.uk/qmss/.

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Ethnic Group Differences in Educational Progress from ages 7 to 11

Ian Plewis

More than one in five pupils in maintained primary schools in England are from minority ethnic groups: 22% in 2007 compared with 18% in 2004 and 11% in 1997. Are there differences in the progress in mathematics made by different groups during the period in primary school between the ages of seven and 11 (i.e. between Key Stages one and two) for the cohort that reached the end of KS1 in 2002 and the end of KS2 in 2006? This period of schooling has received somewhat less attention from researchers than the secondary school period. Focusing on educational progress tells us whether any ethnic group differences are widening or narrowing across this period of schooling whereas a focus on attainment would tell us about differences at, say, the end of primary school.

The analyses are based on data from the National Pupil Database (NPD) which generates longitudinal records of pupils' attainments and includes a detailed classification of ethnic groups.

The figure shows the progress (relative to white boys) of boys in the main minority ethnic groups for two groups: low and high attaining pupils at KS1. We see that:

- The progress of boys from the 'mixed' group is essentially the same as for the white boys.
- The progress of boys from the Indian, Pakistani and Bangladeshi groups is faster than that for white boys.
- Amongst the higher-attaining boys in mathematics at KS1, the progress of black Caribbean and black African pupils is slower than it is for white boys.



- Chinese pupils make more progress than any other group.

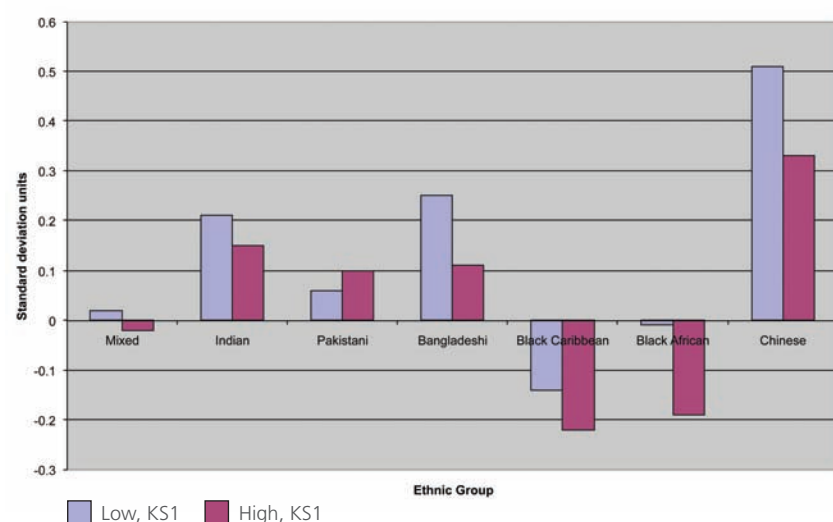
The generally optimistic picture of minority ethnic group performance in mathematics is tempered, however, by one area of concern: the progress of black Caribbean boys. We find that black Caribbean boys are well behind their white British counterparts at KS2 and that they make less progress than all other groups between KS1 and KS2, and this is particularly so for pupils who

were doing well at KS1. Moreover, the gap between them and white British pupils does not appear to have narrowed over a generation. Nor does the situation seem to improve in secondary school or in later life.

The NPD is ideal for describing differences but not for understanding why these differences exist and why they appear to be so persistent. It is worth noting that the proportion of the black Caribbean group claiming free school meals, although much higher than for white British families, is not as high as the Bangladeshi, black African and Pakistani groups and so poverty does not seem to provide a full explanation of these differences. One possible explanation comes from the data on between-school variance. This is greater for low attaining pupils at KS1 and also for the combined black group of black Africans and black Caribbeans. This suggests that primary schools can have both stronger positive and negative effects for low attainers and, conditional on low attainment, for the black group. It might therefore be possible to learn more about factors that either depress or enhance the attainments of these groups from more detailed study within schools.

For a fuller discussion see Plewis, I. (2009) *Ethnic Group Differences in Educational Attainments and Progress Revisited*. CCSR Working Paper 2009 – 01.

Mathematics progress relative to white pupils, KS1 to KS2, boys



Using Pupil Data to Measure Internal Migration

Naomi Marquis and Stephen Jivraj

The study of internal migration is central to understandings of demographic change, but is more difficult to measure than other components of population change, and in the UK data are limited. Regularly updated NHS patient records are useful for studying migration for the population as a whole, and by age and sex, but lack other important characteristics.

The decennial population census, on the other hand, contains socio-economic and ethnic detail, but is limited by its collection once every 10 years. We have explored the potential of a relatively new internal migration data source which may fill some of the gaps left by current datasets. The Pupil Level Annual School Census (PLASC) offers more up-to-date information than the decennial census and contains more socio-economic and geographical detail than NHS patient records. However, the PLASC only contains information for children aged 5 to 15 who attend state school, although interpolation techniques can be used to estimate data that are omitted or incorrect. Where pupil characteristics, such as gender, change unexpectedly over time, or are missing or invalid in one or more years, a revised version of the attribute in question can be created based on the most commonly occurring value of that attribute, thus improving data quality.

Using PLASC data, internal migration of pupils is measured through a change in residential postcode between two data collections.

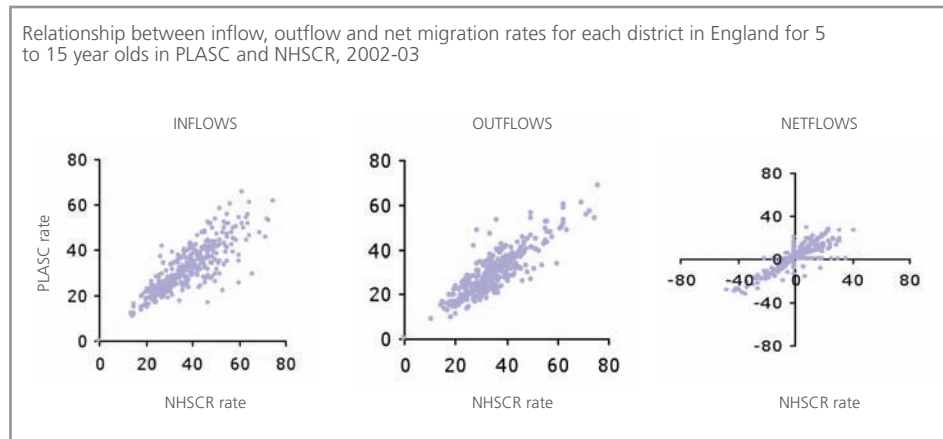
Migration as measured by the PLASC shows patterns and trends that are similar to those found in other datasets. For example, the figure below shows the degree of association between in, out and net migration rates for districts in England as measured by the PLASC and National Health Service Central Registry (NHSCR). There is a strong positive relationship between the migration rates in the PLASC and NHSCR, suggesting that the PLASC picks up migration in a similar way to the NHSCR.

Overall, we find that the PLASC has considerable potential to provide new insights into the levels and patterns of internal migration in England. The data provide a more up-to-date measure of migration than the census, and more detailed information about the socio-economic characteristics and geographical location of

migrants than the NHSCR. The data are, however, limited to measuring the movement of state-school pupils. Thus it is difficult to make inferences from the PLASC about the movement of the wider population, especially as families with school-aged children are less likely to move than other groups.

For a fuller discussion see Jivraj, S. & Marquis, N. (2009) *The Pupil Level Annual School Census: A new approach to measuring internal migration of school pupils in England*. CCSR Working Paper 2009 – 04.

Marquis, N. & Jivraj, S. (2009) *Preparation of Pupil Level Annual School Census data for the analysis of Internal Migration*. CCSR Working Paper 2009 – 03.



Ethnic Differences in Physical Activity and Obesity

Vanessa Higgins and Angela Dale

The rapid rise in obesity over the past decade has resulted in widespread concern over its implications for public health. The UK Government has set recommended guidelines and a series of action plans aimed at reducing obesity levels – these include guidelines for adults to participate in physical activity at least 5 days a week for at least 30 minutes per day. We have used data from the 2004 Health Survey for England to provide a detailed breakdown of differences in levels of obesity and physical activity for men and women in eight major ethnic groups. Obesity is measured by Body Mass Index (BMI).

For all ethnic groups, men are more likely to meet the physical activity guidelines than women and younger age groups more likely to do so than older groups (with the exception of the Chinese group). Levels of physical activity are particularly low among Pakistani, Bangladeshi and Chinese women.

Among men highest levels of obesity are in the Irish, Black-Caribbean and White groups whilst, for women, the Black-African, Black-Caribbean and Pakistani groups have the highest levels of obesity. Within these groups obesity levels are markedly higher for older women than for younger women. Chinese and Bangladeshi men and women have the lowest levels of obesity.

Logistic regression models show that ethnic differences in obesity and physical activity remain after holding constant socio-demographic, socio-economic and area characteristics but these differences vary between ethnic groups and by gender. Black-Caribbean and Black-African women have higher odds of obesity than White women but obesity among Black-Caribbean and Black-African men is not significantly different to White men. South Asian men have lower odds of obesity than White men but South Asian women are not significantly different to White women.

Men and women with no qualifications or low-level qualifications have higher odds of being obese than those with degree-level qualifications. Low income is a predictor of obesity (by comparison to higher income) for women, but not for men. Economic status is related to physical activity (but not obesity) - unemployed and economically inactive men and women have lower odds of meeting the physical activity guidelines than men and women in employment. The kind of locality in which you live is not generally an important predictor of obesity or physical activity and neither is the timing of

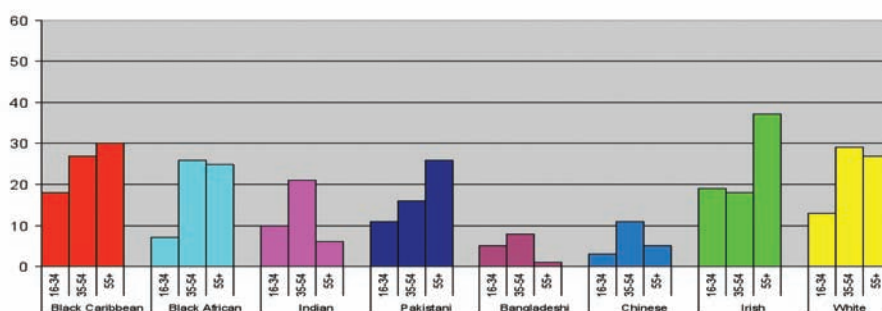


migration to the UK. As one might expect, those who meet the physical activity guidelines have lower odds of being obese than those who do not meet the guidelines. However, this is not a straightforward relationship because both Chinese men and women and Bangladeshi men are less likely to be obese than the White

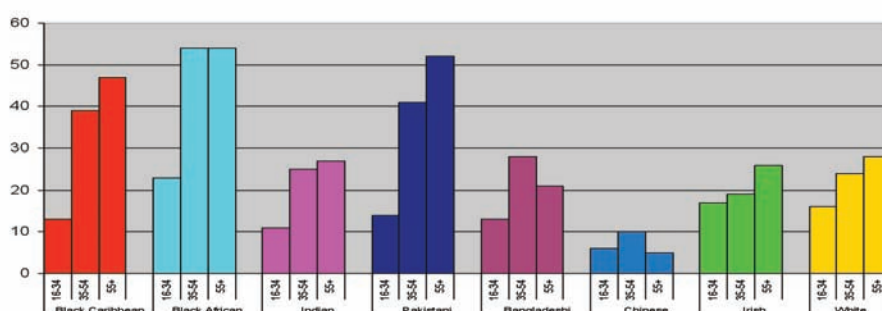
comparator group and also less likely to meet the physical activity guidelines.

A fuller analysis is available in Higgins, V. & Dale, A. *Ethnic Differences in Physical Activity and Obesity*. CCSR Working Paper 2009-05

Obesity by age group and ethnic group – males aged 16+, HSE 2004 (%)



Obesity by age group and ethnic group – females aged 16+, HSE 2004 (%)



The Gender Pay Gap Over Time in the UK

Wendy Olsen, Vanessa Gash, Leen Vandecasteele, Pierre Walthery and Hein Heuvelman

Latest figures show a gender pay gap of 15% between men's and women's full-time hourly pay. If this gap is to be reduced, then understanding the causes of the difference is crucially important. This project analyses the causes for the fall in the gender pay gap in the past ten years in the UK using the British Household Panel Survey from 1995-1997 and 2004-2007 and the BHPS work-life history data covering more than 17 years for each of over 10,000 people. The consistent decomposition of the gender pay gap at two points in time allows us to examine why men and women's earnings have moved differently.

Wage regressions for each time period controlled for a broad range of variables including: education, unemployment, work experience, job tenure, sex segregation (measured by the degree of male prevalence in each occupational group), firm size, industrial sector, region, trade union membership and gender. Using standard decomposition techniques we were then able to identify the main constituents of the pay gap which explain approximately 30% of the gender pay gap. Working in a sex-segregated occupation was found to be the largest explained factor behind low pay, accounting for 16.6% of the wage gap in the 1990s and 15.5% of the wage gap in the 2000s. The second largest explained factor is education level, accounting for 9.2% of the gender pay gap in the 1990s though decreasing to 6.6% in the 2000s.

In the decomposition analysis some factors were identified as protective of women's pay. Women who worked in the public sector and were members of trade unions were found to achieve higher pay levels than women in the private sector and those who are not trade union members. These effects are particularly strong in the latest 2007/8 data, with a reduction of 6% in the pay differential due to these 'institutional' effects. Finally, and most importantly, the single largest component of the gender pay gap is unmeasured, and relates to the pay differential due to gender or sex. In 1997 we found that 73% of the gender pay gap was 'unexplained' while in 2007 this dropped to 62%; this proportion is assumed to be due to being female.

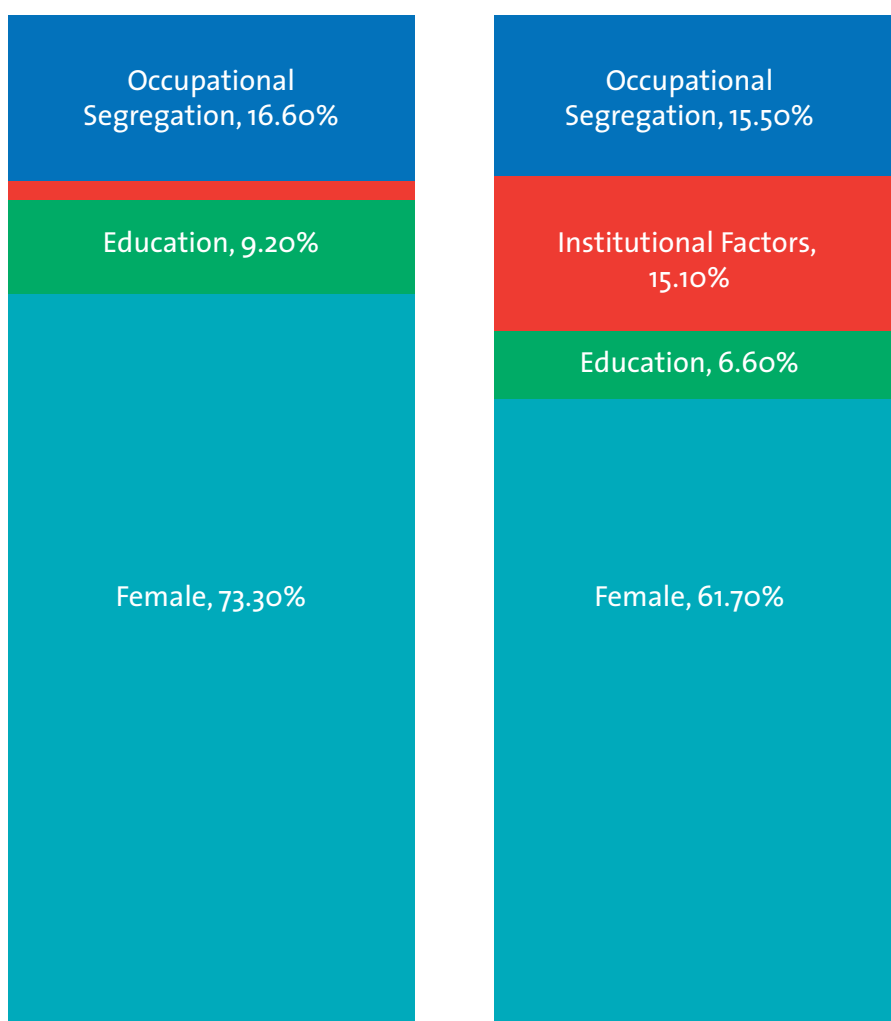
A further development of this work brings full-time, part-time and domestic caring work histories into the wage model. Here we find that each year of full-time work contributes positively

to wages, but part-time work experience does not. Furthermore, each year of family care work contributes negatively to the wages earned upon return to work. These factors help explain the large part of the pay gap that is driven simply by 'being female', with the gender residual down to 36% in estimations that control for work-life history. In the last stage of the research, we use a structural equation model to analyse the direct and indirect drivers of the pay gap. Here, flexibility of working hours and payments made for childcare appear to have low explanatory

power, whereas part-time work, career interruptions, sex segregation and institutional factors have high explanatory power. Policy attention can be directed at institutional factors and at the impact of career interruptions.

For further discussion and results see Olsen, W., Gash, V., Vandecasteele, L., Walthery, P., and Heuvelman, H. (forthcoming), *The Gender Pay Gap in the UK 1995-2007: Research report number 1*, Government Equalities Office.

Decomposition Summary of the Gender Pay Gap in Great Britain in 1997 and 2007



Help in Context: A Multilevel Analysis of the European Social Survey

Kingsley Purdam and Mark Tranmer

We have used the European Social Survey (ESS) to establish the importance an individual attaches to helping others (the value of help), the degree to which they actually help others in practice, and people's perceptions of the local culture of help. Whilst research has already examined variations between people, areas, or countries using single measures of civic engagement such as voter turnout, a variety of measures are needed to capture an individual's civic values and behaviour more fully. Some underlying notion of help underpins all civic participation.

'Help in context' can be thought of in three ways: (i) the country or local area in which an individual



lives including the local culture of help; (ii) the demographic characteristics of the individual; (iii) the association of help outcomes with measures of civic engagement, happiness and well being. We use a very general measure of helping in

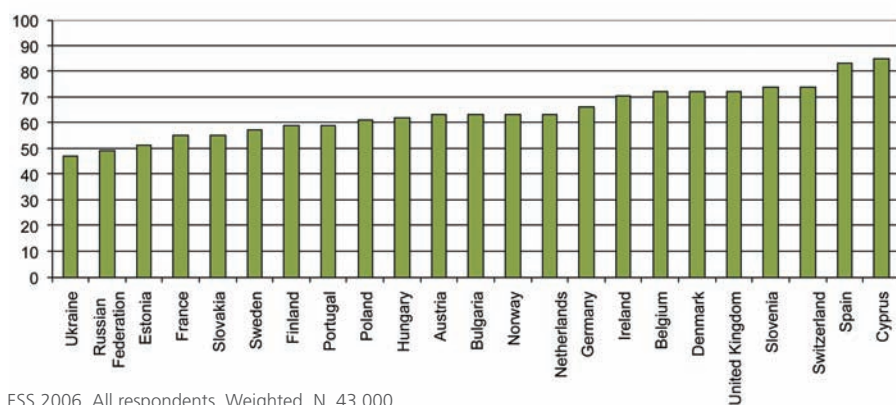
practice so that we can map people's general orientation towards help and helping: "In the past 12 months, how often did you help with or attend activities organised in your local area?". A multilevel approach allows us to disentangle the country, region and individual level variations in help outcomes as well as being a very convenient framework for dealing with multivariate responses.

The importance people give to helping others (helping as a value) varies across European countries at both the country and individual level. There is also considerable variation in the extent to which people help others in practice. Overall, the proportion of people who think helping others is important (helping as a value) is much higher than the proportion of people who have actually helped others in practice. However, helping people in practice is more strongly associated with other civic engagement outcomes than helping as a value.

It can be conjectured that barriers prevent some people from articulating their values in their everyday lives, or that whilst people think help as a value is important, a situation has not arisen where they felt they needed or were able to help anyone in practice. The local context of help is an important factor when considering the likelihood of someone helping in practice and being involved in other civic engagement activities. As the person's perception of the extent to which people in their local area help one another increases so does, on the whole, their likelihood of voting, contacting a politician, signing a petition and being involved in voluntary activity. The findings have important implications for policy makers in relation to renewing civic engagement and to identifying and overcoming the barriers to creating a more civic society.

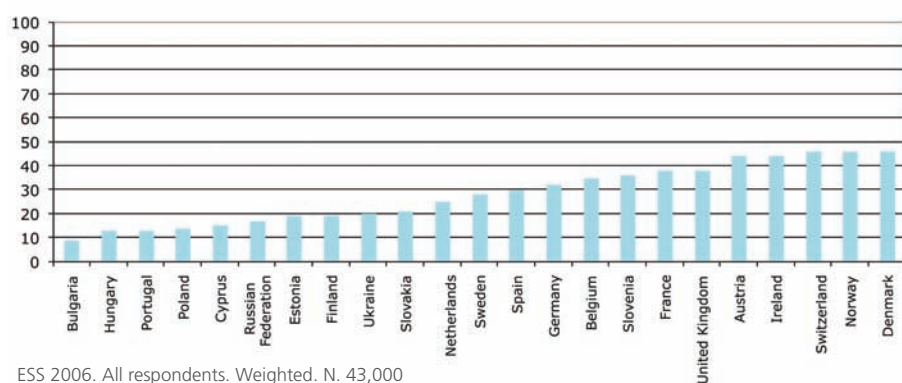
For the full analysis, results and discussion see Purdam, K. and Tranmer, M. (2009) *Help in context: a multilevel analysis of the European Social Survey*. CCSR Working Paper 2009-07.

People stating helping other people is important (%)



ESS 2006. All respondents. Weighted. N. 43,000

People stating that they help in practice (%)



ESS 2006. All respondents. Weighted. N. 43,000

Personal Support Networks of Immigrants to Spain: A Multilevel Analysis

Mark Tranmer and Veronica de Miguel

The personal support networks of recent immigrants to Spain have been analysed by Mark Tranmer and Veronica de Miguel (University of Granada; University of Barcelona) using multilevel logistic regression models to explore ego-net data. This work also demonstrates an application of multilevel modelling in social network analysis.

Immigrant flows to Spain have increased greatly in the last decade, but little is known about the composition and role of personal support networks of these immigrants. The research asks: 1) to what extent are Spaniards, (i.e. more settled Spanish residents) present in an immigrant's network, compared with non-Spaniards, such as other recent immigrants? 2) Which factors are associated with ties between immigrants and Spaniards compared with ties between immigrants and other recent immigrants. 3) Do the support networks of recent immigrants and Spanish residents differ?

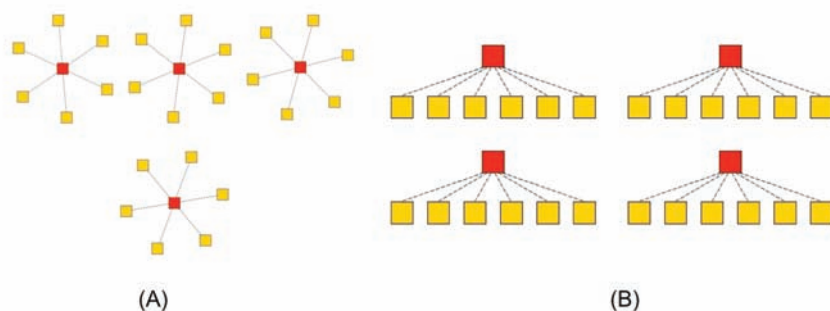
To answer these questions we analysed specially collected personal network (ego-net) survey data. In the survey each immigrant was asked about the role of their close support network, typically comprising about six people, in terms of job searching, accommodation, information and material help. Multilevel logistic regression models were applied, where the dependent variable is whether the immigrant (the ego in the network) has a tie to a Spaniard alter, as opposed to another recent immigrant. Using this model framework, we examined which characteristics are most

strongly associated with the probability of a tie between an immigrant and a Spaniard, and consider characteristics of the alters, the immigrants (ego), the relative characteristics of ego-alter, local geographical factors and support roles. Finally, we use single-level ordered logistic regression models to investigate factors associated with the total number of Spaniards in an ego's personal support network. Attributes of the alters and egos are found to be important in predicting ties between immigrants and Spaniards, and to predict the total number of Spaniards in an immigrant's network. One of the most important attributes is the country of origin of the immigrant, which remains statistically significant, even having controlled for other explanatory variables at the various levels.

Figure (A) below shows four ego networks, each with six alters. The egos appear in red in the centre of the stars and the six alters are in yellow. If the assumption can be made that the alters of one ego do not overlap with the alters of another ego, then the ego network can be represented as a 2 level multilevel dataset with ego at level 2 and alter at level 1, as figure (B) shows. Thus the full network information is retained rather than aggregating the data to a single level. Whilst the assumption of non-overlap between the alters of different egos is often strong, in this case the assumption is reasonable because of the sampling method and sampling fraction used to collect the data.

For more information see: Tranmer, M. and Miguel, V. (2009) *Personal support networks of immigrants to Spain: a multilevel analysis*, CCSR Working Paper

(A) Ego Network; (B) re-organised as a 2-level data set.



Research News in Brief

Attrition in the Millennium Cohort Study

Ian Plewis

A primary aim of most longitudinal studies – and this includes the UK birth cohort studies – is to describe and explain change, and to base these descriptions and explanations on inferences from a properly selected sample to a well-defined population. Achieving this aim is threatened by non-response: some selected members of the population do not participate from the outset, others respond at some waves but not at others, and some initially participate but then drop out never to return. The Millennium Cohort Study (MCS) – the fourth in the world-renowned set of UK birth cohort studies – suffers from all these threats to soundly-based inferences. It is important to take these threats seriously but not to be overwhelmed by them. One way of mitigating concerns about the increasingly unrepresentative nature of longitudinal samples is to understand more about the characteristics of those lost from the sample, both at the outset and over time.

Just over a quarter of the selected sample of nine-month-old children never became members of the cohort study. These children were more likely to be living in Northern Ireland, living in poorer families and living in poorer areas. A further 20% of the sample was lost between waves one and two. We found that the correlates of non-response differed according to whether cases were lost through not being located, not being contacted, and refusing to participate. Residential mobility is an important contributor to overall non-response although if a moving household is located and contacted then they are slightly less likely to refuse. Non-respondents are both numerous and systematically different from the respondents in MCS. On the other hand, the evidence from the first two waves suggests that the effects of non-response on longitudinal analyses of interest are unlikely to be severe. Researchers should, however, remain vigilant.

Further details can be found in:

Plewis, I. (2007) Non-response in a birth cohort study: the case of the Millennium Cohort Study, *International Journal of Social Research Methodology*, 10, 325-334.

Plewis, I., Ketende, S. C., Joshi, H. and Hughes, G. (2008) The contribution of residential mobility to sample loss in a birth cohort study: evidence from the first two waves of the UK Millennium Cohort Study, *Journal of Official Statistics*, 24, 365-385.

New Research in Progress

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Public Attitudes to Environmental Change — Evidence Review

Kingsley Purdam is conducting a review of the evidence on public attitudes towards climate change, funded by the Living with Environmental Change programme (www.lvec.org.uk/) and in partnership with the Tyndall Centre for Climate Change Research.

The evidence review will cover public attitudes to the environment including: climate change; ecosystem management; human, plant and animal health alteration due to environmental change; UK infrastructures and associated systems including carbon allowances; and analysis of views from different cultural, social and economic groups. Where possible the review will highlight the impact of specific policy initiatives in encouraging attitudinal change. The review will also highlight any gaps in the evidence base. For more information see www.ccsr.ac.uk/research/envchange.html

Administrative Data Liaison Service (ADLS)

Administrative data, information collected primarily for administrative purposes and not for research, has long contributed to official statistics. In the last 5-10 years, technological developments have facilitated the formation of very large administrative databases held by central or local government or by specialist agencies across the UK. This raises the possibility that such data could become a core resource for academic social and economic research.

The Administrative Data Liaison Service (ADLS) is an ESRC funded service designed to encourage and facilitate research access to administrative data. Mark Elliot is part of the ADLS team, providing strategic input on data security and disclosure matters. The ADLS will run for three years in the first instance and is led by Chris Dibben at the University of St Andrews.

CCSR Short Courses

September 2009-March 2010

- Questionnaire Design
- Cognitive Interviewing for Testing Survey Questions
- Standardised Multi-Item Scale Development for Surveys
- Qualitative Comparative Analysis
- Fuzzy Set Analysis
- Skills for Commissioning Research
- Handling Missing Data in Longitudinal Surveys
- Social Network Analysis
- Introduction to STATA
- Starting SPSS
- Markov Chain Monte Carlo (MCMC) Methods
- Introduction to Data Analysis Part 1
- Introduction to Data Analysis Part 2

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Seminars Autumn 2009 Tuesdays at 4pm

22nd Sept

Comparative analysis using the European Social Survey. Dr Eric Harrison, City University, London.

29th Sept

Statistical inference for count time series data. Professor Peter Neal
Mathematics, The University of Manchester.

6th Oct

The dynamic life of groups - some insights from simulation. Dr Bruce Edmonds, Centre for Policy Modelling, Manchester Metropolitan University.

13th Oct

On the idea of poverty traps. Professor Sir Partha Dasgupta, University of Cambridge.

20th Oct

How self-immolation entered the repertoire of contention. Dr Michael Biggs, Department of Sociology, University of Oxford.

27th Oct

Do active labour market policies reduce the harmful effects of job insecurity? Evidence for flexicurity from the EWCS and ESS.
Dr Brendan Burchell, University of Cambridge.

3rd Nov

Immigrant political behaviour in Europe.
Dr Aida Paskeviciute, Dept of Government, University of Essex

10th Nov

Civil societies in a European perspective.
Professor Loek Halman & Professor Paul Dekker, University of Tilburg, the Netherlands.
Note room change - University Place 4.212

17th Nov

Employment inequalities: trends over 30 years. Professor Richard Berthoud
Institute for Social and Economic Research, University of Essex.

24th Nov

Work-life reconciliation in Europe: the relevance of work time for women.
Dr Tracey Warren, University of Nottingham.
Note room change - University Place 4.210

1st Dec

Accountability and representation: the voters' perspective. Dr Stephen Fisher, Department of Sociology, University of Oxford.

8th Dec

Recent developments in latent variable modeling for detecting extreme responses.
Dr Irini Moustaki, London School of Economics.

See www.ccsr.ac.uk/seminars/
for up to date details.

Consultancy

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