Understanding Society

UNDERSTANDING SOCIETY: EARLY FINDINGS FROM THE FIRST WAVE OF THE UK'S HOUSEHOLD LONGITUDINAL STUDY

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PREFACE

Patricia Broadfoot
Chair of Governing Board

Understanding Society: a living laboratory of British life

Understanding Society represents a step-change in the ambition of social scientific research. As a longitudinal social survey, it will provide a unique and enduring window on British society in the 21st century. It will allow researchers, policy-makers and the general public to learn about patterns of family life; people's experiences of work and education; their health and their attitudes to key 21st century challenges, such as climate change and community cohesion, on a scale hitherto impossible. It will be able to document how these different aspects of people's lives change over time in response to both their own changing circumstances and those in the external political, social and economic environment.

These developments are possible because of the significant number of innovative features that characterise the survey. These features include the extraordinary scale of the survey and the collection of data from *all* members of the 40,000 households studied. The creation of an ethnic minority booster sample will ensure that these communities and their potentially unique characteristics are covered in sufficient numbers such that they are adequately represented in the overall picture of UK society today. The survey will include the collection of bio-markers and other health data. This will enable researchers as never before to explore the links between health and social factors. Finally, *Understanding Society* will pioneer linkage with a variety of Government datasets, thereby significantly extending the scope of the survey.

If the ambitious goals of *Understanding Society* are to be achieved, equally ambitious developments in research techniques will be required, with new approaches needed to the collection of data and to encouraging participants to remain in the study. There will need to be new measures to regulate the management of access to the data on the part of the different communities that may wish to use it and there will be important work today in addressing the novel ethical issues that will arise in a study of this scale and complexity. However, the rewards will be commensurate – nothing less than the creation of a living laboratory of British life.

This volume of first findings gives an early taste of the kinds of analysis that will become possible over time, as well as some tantalising new insights into aspects of contemporary life that have already emerged from the survey. With regard to family life, for example, Chapter 2 shows clearly that eating an evening meal together has an important link to children's happiness. Chapter 4 provides novel and important insights into sibling bullying. Chapter 10 suggests that the topic of sleep quality and duration has been much neglected by social scientists, despite its importance as an influence on health, well-being, safety, productivity and performance. It describes how *Understanding Society* will redress this omission and presents some important early findings about the links between gender, health, socio-economic circumstances and sleep. As the recession and recent Government cuts impact on people's economic circumstances, the large and representative sample of *Understanding Society* will make it possible to track their effects on particular sub-groups of the population such as the unemployed, single-parents or older people. *Understanding Society* will also make it possible to document changes in the characteristics of society as a whole at this time of momentous political change, such as increased inequality and pressures on mental health.

One of the most important features of *Understanding Society* will be the power of the unique size and scope of the survey to challenge taken-for-granted assumptions about cause and effect. Although this is likely to become increasingly possible over time as the longitudinal nature of the data allow a greater focus on change, even in this volume of *Early Findings*, there are many examples of unexpected and important insights which have already emerged from the data and are likely to prove significant in informing policy-making and professional practice.

In Chapter 3, for example, the data suggest that there is no direct link between material deprivation and life satisfaction for young people. Addressing the subject of health in Chapter 9, the authors argue that mental resilience is not necessarily linked to physical health. In early findings on material well-being reported in Chapter 7, the data reveal that the relationship between income and deprivation is not straightforward but varies with levels of qualification and house-ownership. And again, despite the received wisdom prevalent in society today that social bonds are in terminal decay, the analysis of patterns of participation reported in Chapter 8 offers a fascinating insight into the significant increases in community participation that are associated with retirement.

If the ambitious goals of *Understanding Society* are to be achieved, equally ambitious developments in research techniques will be required

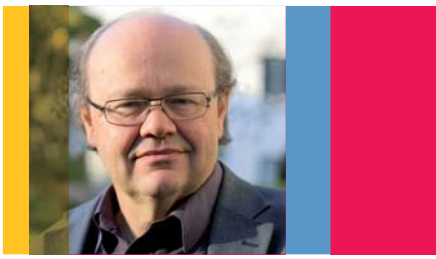
These examples represent only a fraction of the many fascinating new insights that this *Early Findings* publication from *Understanding Society* provides. More than anything, these early analyses highlight the potential of the study to provide a much more comprehensive picture about individuals, households and communities in the UK today. Uniquely, perhaps, the household focus of the study will allow a level of sophistication in our understanding of important issues such as attitudes to carbon-reduction and climate change, since as the analyses of Chapter 12 demonstrates, such attitudes are shaped by the subtle inter-play of intra-household dynamics. Perhaps even more important still, will be the scope that *Understanding Society* offers to explore the interaction between the various topics that it covers through its innovative research methods, its uniquely large scale and the wide and changing range of topics covered.

But great ambitions are inevitably associated with significant risks. Both the Governing Board of the study and the research team are very much aware of the challenges that will accompany such an ambitious project. These range from the significant technical challenges associated with the scale and range of the ambitious programme of data–collection that is planned for *Understanding Society*, to the political and ethical issues that are inextricably associated with working with multiple partners and datasets. They also include the financial sustainability of the survey at a time of scarce Government resources.

Good communication will be central to overcoming these challenges. Perhaps most important of all, effective communication of emerging findings will be critically important in ensuring the continued interest of the households on which the survey depends. It is vital that attrition rates are kept to a minimum through the enthusiastic and willing on-going participation of the sample households. Good communication will also play a key role in making the research community aware of the rich seam of data that *Understanding Society* provides and so lead to its significant use across the social science community. Effective communication will be key to convincing potential funders that infrastructure for social science is just as important, in its own way, as well-equipped laboratories and sophisticated equipment are to the natural and medical sciences.

Social science has been constrained for far too long by a lack of sufficient capital investment. This has made it impossible to achieve the research scale necessary to tackle some of the complex and important issues facing our society. With the advent of *Understanding Society*, highly-skilled social scientists can get to grips with the important questions of our age using a high quality, integrated dataset that supports a hitherto unavailable range and scale of analysis. Academia, Government, business and charities are already beginning to work together under its banner. Such collaboration is likely to grow in response to the range and quality of study that data from *Understanding Society* will make possible. These are exciting times for all those seeking to understand more about the society we live in today. *Early Findings* offers an initial taste of the feast that is in store for social research.

INTRODUCTION



| Nick Buck, Principal Investigator

Understanding Society is a major social science investment in longitudinal studies with potentially huge long term implications for the understanding of the UK in the early 21st century.

This book provides a first view of the results from the study and presents some early findings from research carried out by researchers mainly, but not exclusively, based at the Institute for Social and Economic Research (ISER) and within the study team. The chapters are based on data from the first year of the first wave, collected in 2009, from approximately 14,000 households containing 34,503 individuals, adults and children. Of these, 22,265 adults gave a full interview and 2,163 children aged 10-15 also gave an interview. Individual chapters provide further information about the specific samples used.

We expect and hope that these early findings will be rapidly superseded by further analyses by a much a wider range of researchers. The data used in this book were made available to the wider community of researchers in December 2010 through the Economic and Social Data Service.

Although these are early findings, they cover a wide range of domains of people's lives and experiences and much, though by no means all, of the questionnaire content included in the Wave 1 survey. The purpose of the volume is not only to present and share these findings, but more importantly to give future users of *Understanding Society* a sense of the potential of the study. We look forward to demonstrating that potential even more clearly once *Understanding Society* has collected longitudinal data. This introduction aims to set these findings in the longer term context of the study, both in terms of its role as longitudinal study and the wider research agenda it will support.

Understanding Society builds on the success of the highly successful British Household Panel Survey (BHPS). The BHPS is heavily used by government departments and by researchers within and outside the UK. It has been accessed by more than 2000 users and generates more than 150 publications per year. However, the ambitions of *Understanding Society* go well beyond what has been achieved with the BHPS, and to support a much wider range of research. It is an extremely important addition to the UK's rich portfolio of longitudinal studies and continues and enhances the UK contribution to an international network of household panel studies, including the US Panel Study of Income Dynamics, the German SOEP, Australia's HILDA, the Swiss Household Panel and many others.

Just over 16 years ago, some of the people involved in this book were also involved in a somewhat similar exercise, the production of *Changing households: the British Household Panel Survey 1990-1992*[1]. This was amongst the first publications based on the BHPS, and as indicated above, it was followed by many hundreds more. Nevertheless, it was an important opportunity to introduce the novelty of a household panel and its opportunities in Britain. BHPS and other UK longitudinal studies have had a major impact on the research environment and indeed the way we understand society in terms of 'the complex pattern of continuity and change that make up the lives of individuals and households' (p10).[1]

OVERVIEW OF *UNDERSTANDING SOCIETY*

This volume contains an appendix providing information on the design of the study and the data collection for Wave 1. Here, we summarise some of this, in order to set the context for the rest of the book.

The study consists of four distinct samples: (a) a new random sample representative of the whole UK population large enough for the investigation of sub-populations, of around 27,000 households; (b) an ethnic minority boost facilitating minority group research, around 4,000 households; (c) the incorporation of the existing BHPS sample of around 8,200 households, and (d) an Innovation

[1] Along with the author of this chapter, this book was edited by Jonathan Gershuny, David Rose and Jacqueline Scott, who were all key influences on the successful development of the BHPS and hence on the ultimate establishment of *Understanding Society*.

Panel of around 1500 households, used primarily for testing purposes. The BHPS has 18 waves of data, which provides opportunities for early analysis of long durations. The target of 40,000 households across the study's samples gives a unique opportunity to explore issues for which other longitudinal surveys are too small to support effective research. It permits analysis of small subgroups, such as teenage parents or disabled people, and analysis at regional and sub-regional levels, allowing examination of the effects of geographical variation in policy, for example differences between the countries of the UK. For example, Taylor's chapter on employment and unemployment reports differences in employment status and financial well-being by country. The large sample size also allows high-resolution analysis of events in time, for example focussing on single-year age cohorts.

Understanding Society builds on the success of the highly successful British Household Panel Survey (BHPS)

As indicated, *Understanding Society* includes a significant sample boost for key ethnic minority groups and specially designed questionnaire supplements, to provide the base for major longitudinal analysis of minority experiences in the UK. Based on the importance of increasing ethnic diversity, examination of ethnic variation will contribute to many aspects of the research agenda.

Because of its large sample size, the fieldwork for *Understanding Society* takes place over a two-year period. However, we have maintained the BHPS practice of a 12-month gap between interviews with participants. It is important from an analysis perspective to carry out interviews relatively frequently with participants in order to capture information about changes in their lives over relatively short periods, before events are forgotten. Thus, there is an overlap between the waves. So Wave 1 of the main survey started in January 2009 and ended with a sample issued in December 2010. Wave 2 started in January 2010 and will end at the end of 2011 and so on.

Wave 18 data from members the BHPS sample was collected in autumn 2008, and they become fully integrated into *Understanding Society* from Wave 2. The first year of data from the ethnic minority boost is available, but numbers in each of the key groups are still rather small with only half the target, and results from this sample will be reported when the whole of Wave 1 is released in the latter part of 2011.

The study also opens exciting prospects for advances at the interface between social science and bio-medical research. It will provide the opportunity to assess the relationships of a wide range of exposures and antecedent factors to health status. The addition of appropriate health-related measures to the study will also contribute to the relationships between our genetic make-up and our social environment and background.

UNDERSTANDING SOCIETY AS A LONGITUDINAL STUDY

The development of longitudinal studies has advanced social science methods, the understanding of major social changes, and better assessment of policy interventions. The UK has taken a prominent role in the development of longitudinal studies, especially with its unique portfolio of birth cohort studies, the ONS Longitudinal Study of the Census, the English Longitudinal Study of Ageing, the Longitudinal Study of Young People in England, the British Household Panel Survey, and many others. These studies provide an understanding of social change, the trajectories of individual life histories, and the dynamic processes which underlie social and economic life.

Understanding Society is a major addition to this portfolio. As a longitudinal study it is following individuals over time, regularly collecting data about each participant and his or her household. It will provide unique information on the persistence of such states as unemployment, child poverty or disability, on factors which influence key life transitions, such as marriage and divorce, labour force entries and exits and retirement, and will provide information on the effects of earlier life circumstances on later outcomes.

It will support research relevant to the formation and evaluation of policy and will also foster the development of improved and more reliable analytical techniques. Cross-sectional data, based on only a single observation of each individual cannot achieve these aims.

The UK, in common with most western societies, is undergoing multiple forms of socio-economic change. We have an ageing population, an increasing diversity of ethnic background, and increasing levels of instability in working careers and in family life. These take place in the context of an increasingly complex situation of international globalisation, with conflicting pressures, sometimes towards European centralisation, others toward regional specialisation and devolution. Longitudinal studies have a major role in understanding these social changes since they collect data about different time points within an individual's life, or indeed to look across generations, by collecting and linking data from different points in the lives of parents and children. Longitudinal analysis can provide very different understandings from cross-sectional ones. Specific examples of anticipated uses for the longitudinal data are included in the chapters. Here are some important issues for which we anticipate contributions from the longitudinal data of *Understanding Society*:

- The analysis of the incidence of states and events such as poverty or unemployment over time.
- The measurement of the rates of transition between states, and the factors associated with them. These might include spells of illness or transitions in partnerships. The analysis of associations between the life courses of different household members, and of their mutual interactions, is enabled by *Understanding Society* interviews with all household members from age 10 to examine the dynamics of household formation and dissolution and associated outcomes.
- The analysis of the association between change in the different domains (e.g. health and the labour market), to understand causal ordering.
- Analyses which take account of unobserved differences through the use of repeated measures. The accumulation of life history data, to analyse the long-term accumulation of personal and financial resources and their outcomes.
- The sustained collection of short-term data makes it possible to accumulate long-term sequences of high quality biographical information across multiple domains. The central purpose of *Understanding Society* is then to understand the individual dynamics of change experienced by the population of the UK. With a national sample covering the whole population, *Understanding Society* will also provide representative cross-sectional population estimates for each wave as shown in this volume. Nevertheless, its real strength will be the provision of nationally representative longitudinal data at the individual and household level across a range of substantive domains.

THE LONGER TERM *UNDERSTANDING SOCIETY* RESEARCH AGENDA

Understanding Society has broadly conceived goals. It aims to provide a resource across the social sciences and beyond to embrace bio-medical sciences and other physical sciences, e.g. the environmental sciences. It is beginning to collect physical measures and information in a variety of ways, as well as qualitative, visual and audio data.

Longitudinal studies have a major role in understanding complex social changes

The study has a much broader research agenda compared with other household panel studies and focuses on major new and emerging research agendas for the next decades. Because it involves the collection of data on all members of sampled households and their interactions within the household, there are major advantages for important research areas such as consumption and income, where within-household sharing of resources is important, or demographic change, where the household itself is often the object of study. Observing multiple generations and all siblings allows examination of long-term transmission processes and isolates the effects of commonly shared family background characteristics. The design of *Understanding Society* will also provide opportunities to explore linkages outside the household.

This book contains a sample of findings from the potential areas of research which *Understanding Society* is supporting. The content of the questionnaire is shaped by the basic research agenda, but it is important to realise that other topics can also be explored.

Here are some of the key issues facing UK society where *Understanding Society* is providing, and will continue to provide, research opportunities.

- *Understanding Society* can contribute to understanding how **households and families are changing**. Analysis of the stability and shifts within one family's home will be supplemented with information on kin and friends outside the household to examine social support opportunities and the balance of formal and informal provision social care.
- *Understanding Society* will be used to examine the formation of **well-being over the life cycle**. This includes the effects of health and also economic factors of income, savings, asset accumulation, and pensions on the economic and social well-being of older persons.
- *Understanding Society* gives opportunities to examine **different definitions of well-being**, ranging from traditional economic measures based on income or consumption and more subjective measures of happiness and satisfaction.

- **Education, training, and life-long learning** are important issues with implications for labour market success, citizenship, consumption, and socio-economic well-being.
- **The labour market** is changing. This presents questions about wage determination and job matching, job qualities and how these relate to global processes, e.g. migration. Changing patterns of labour market regulation and policies are also important here.
- *Understanding Society* will be useful for understanding the balance of **market and non-market work**, as well as the dynamics of the work-life balance. These questions of balance apply both to individuals and within households.
- *Understanding Society* will make major contributions in the study of changing patterns of economic opportunities, including the **prevalence of persistent poverty and social exclusion**.
- Part of *Understanding Society's* research agenda is motivated by understanding the effects of state policies. For example, it is important to trace the impacts of state responses to economic stress in the form of **deregulation** and reduction in the protection offered by the welfare state.
- There are changes in the **macro-economic environment concerning the management of risks**. How do individuals and households adapt in the UK and internationally?
- There is an important **social mobility** agenda, both, **inter- and intra-generational**, where *Understanding Society* can complement the work of the birth cohort studies. This study offers a wider range of inter cohort comparison, and much greater possibilities for sibling comparisons.
- More generally, there is potential for *Understanding Society* to be exploring the **longer term *social and economic* consequences of potentially disadvantaging or stigmatising states**, such as disability, mental illness, drug taking, criminality, truancy, teenage pregnancy, redundancy or unemployment at individual and household level.
- The panel design facilitates the examination of **migration** and **geographic mobility**, including life course dynamics of relocation, and their consequence for local areas.
- Issues concerning **diversity** are of increasing **salience for public policy and the** understanding of UK society or societies. Diversity is defined in terms of a range of **cultures, practices and identities**: class, ethnicity, gender, sexual orientation, citizenship, national identity, age group, disability status, consumption and lifestyle groups. It is important to understanding the impacts of inequalities associated with this diversity for life chances and for social cohesion.
- Changing patterns of **political engagement and civic participation and how** far people are willing and able to step in to provide services or resources on a voluntary basis if there is a diminishing availability of formally organised public sector provision can be investigated with *Understanding Society*.
- *Understanding Society* will support research on a wide range of questions relating to **environmental change**, and how individuals and households organise to support their environmental preferences and values.
- Through the collection of appropriate biomarkers and objective health indicators, *Understanding Society* will provide the basis for understanding the interactions between **biology and environment** in the formation of health and other outcomes and behaviours.

The above list is one view of the research agenda, but its realisation depends on large numbers of researchers taking up the opportunities the study offers. And it will be up to these researchers, along with the users of research to shape the actual agenda. The chapters presented in this volume are first steps to realising the potential of *Understanding Society*.

The chapters presented in this volume are first steps to realising the potential of *Understanding Society*

FAMILY RELATIONSHIPS

John Ermisch | Maria Iacovou | Alexandra J. Skew

INTRODUCTION

This chapter has two main aims: to provide information about how *Understanding Society* can be used for research on family issues, and to give examples of insights into family life which can be provided by the data. We focus on two sets of relationships – those between married or cohabiting partners, and those between parents and their children.

Our analysis shows that happiness with one's partner declines with the duration of the union and with a person's age; it is higher for marriages than for cohabiting unions; and it is higher for better-educated people. In turn, children (aged 10-15) are happier with their family situation if their parents are happier with their relationship with each other. Frequent quarrels between parents and children go hand in hand with children who are less happy with their family situation. Children who talk about important matters with their parents also report higher levels of happiness with their family situation.

MEASURES OF FAMILY RELATIONSHIPS IN *UNDERSTANDING SOCIETY*

Understanding Society is set to become an unparalleled source of data on the family. Part of its strength lies in the fact that it interviews all members of sample households. This means that if, for example, we are interested in the quality of marital or cohabiting relationships, the relevant information is collected from both members of that relationship, allowing for much richer and more detailed analysis than if it were collected from only one member. And, of course, *Understanding Society*'s value as a resource for family research lies in large part in the breadth of family-based data which it contains.

THE HOUSEHOLD GRID

The household grid is an essential starting point for the analysis of the family. It contains information about the relationships of all household members to one another, and is the means by which we are able to match, for example, data on female sample members with data on their male partners; or data on adolescent children with data on their parents or step-parents.

MEASURES FROM THE ADULT SURVEY

The Family Background Module

This module, which contains full partnership and fertility histories, is answered once by each sample member, in the first wave in which they are interviewed. Individuals are asked about all marital and cohabiting unions which they have had, including those which ended before they moved into their current households; and about all the children they have had or fathered, including children who may no longer live with them.

The Family Networks Module

In this module respondents are asked about family members who do not live in the same household. Respondents are asked about frequency of contact with their fathers, mothers, sons and daughters, and how long it would take to travel to the place where they live. They are also asked about the numbers of living brothers and sisters, grandparents and grandchildren that they have.

Where sample members have children aged under sixteen living elsewhere, they are asked about any child support that they pay. Additionally, for the ethnic minority boost sample and the general population comparison sample, questions are asked about remittances paid to and received from people outside the UK.

The Parents and Children Module

Another set of questions relates to parents' relationships with dependent children who live with them. These include questions on parents' attitudes to education (whether they help their children with their homework, and whether they consider A levels to be important). There are questions relating to the general quality of the parent/child relationship, including the frequency with which parents engage in leisure activities with their children; eat an evening meal together; quarrel with children; and talk about important matters with them. Questions are also asked on the extent to which parents involve the child in setting rules; and how often they praise, cuddle, shout at, slap and spank their children. This module was asked in the first wave, and will be carried every alternate wave. A set of additional questions on parenting styles, which allow the construction of standard measures of parenting style, will commence at Wave 3, and will be asked of parents whenever one of their children reaches the age of 10.

MEASURES FROM THE YOUTH QUESTIONNAIRE

This is a self-completion questionnaire, given in full to all young people aged 10-15, and given in part to young people aged 16-21 who still live in the family home[1]. This questionnaire provides a useful complement to the Parents and Children module, collecting data on many similar issues, but from the point of view of the child or young person.

[1] Note that neither of these age groups is completely congruent with the Department for Education's definition of 'youth', which is 14-19 years old.

The youth questionnaire is given each year; however, many of the questions on family relationships appear only in alternate (odd-numbered) waves. These questions include how often young people quarrel with their mother and father, and how often they talk to each parent about things that matter. Answers are on a 4-point scale, from 'hardly ever' to 'most days'.

There are also questions on how often in the last 7 days the child has eaten an evening meal together with the rest of the family; whether they feel supported by their family; who they would turn to first when they felt upset or worried about something; and about their relationships with their brothers and sisters. Finally, as part of a battery of questions which ask young people how they feel about various aspects of their lives, they are asked to rate how they feel about their families, on a 7-point scale from 1 (completely happy) to 7 (not at all happy).

RELATIONSHIP QUALITY IN THE ADULT SELF-COMPLETION QUESTIONNAIRE

The adult self-completion section of *Understanding Society* contains a number of new questions about individuals' relationships with their spouse or cohabiting partner. These include how often the partners calmly discuss something; have a stimulating exchange of ideas; or work on a project together. The response scale has 6 alternatives, ranging from 'never' to 'more often than once a day'.

There are also questions about how often people 'quarrel with their partners'; 'get on each other's nerves'; 'kiss'; 'regret living together'; and 'consider separation', again answered on a 6-point scale ranging from 'never' to 'all of the time'. There is a question on the extent to which partners engage in outside interests together, and a final summary question on relationship quality, where people are asked to represent the degree of happiness in their relationship, on a 7-point scale ranging from 'extremely unhappy' to 'perfect' (with the middle point, 'happy', defined as the average relationship).

OTHER MODULES

Several other modules may also be relevant to researchers with an interest in the family. A child development module will commence at Wave 3, and will be administered to parents when their children reach the ages of 3, 5 and 8. This module contains a rich set of questions on children's cognitive development and emotional adjustment; the child's experience of school; the child's activities at home; and parental interactions with the child. Questions on childcare are asked each year in the main questionnaire. The life events module records (among other events) details of new births, including pregnancy history, various characteristics of the baby, and details of infant feeding. Beginning in Wave 3, new mothers will be asked about their plans to return to work (or not). Also starting in Wave 3 is a module on non-resident relationships (living apart together, or LATS). A one-off module in Wave 3 will ask about people's access to transport in order to visit their families.

NEW OPPORTUNITIES IN FAMILY RESEARCH

Understanding Society's precursor, the British Household Panel Survey, contained a range of information on family relationships which was more limited than the range in *Understanding Society*. Nevertheless, it did enable groundbreaking research in a large number of areas, including, but certainly not limited to: children's family forms (Robson, 2010; Ermisch & Francesconi, 2000); home-leaving (Ermisch & Di Salvo, 1997); partnership formation, dissolution and re-formation (Walker & Zhu, 2006; Jarvis & Jenkins, 1999; Gardner & Oswald, 2006; Skew, Evans & Gray, 2009); fertility (Aassve, Burgess, Propper & Dickson, 2006; Berrington, 2004; Iacovou & Tavares, 2010); lone parenthood (Gregg, Harkness & Smith, 2009); friendships (Pahl & Pevalin, 2005) and living arrangements in older age (Gray, 2005; Evandrou, Falkingham, Rake & Scott, 2001).

Understanding Society will open up many new avenues of research. The ethnic minority boost samples will provide an unprecedented opportunity to study family life across a range of ethnic groups, which was not possible with the BHPS. The much larger sample sizes will allow researchers to analyse relatively uncommon family forms, which again would not previously have been possible. The modules on parenting and child development are for the most part entirely new, and will allow research in completely new directions, as will the new batteries of questions on relationship quality. The section which follows gives examples of just a few of the new issues which *Understanding Society* will allow us to address.

RESULTS FROM *UNDERSTANDING SOCIETY*

RELATIONSHIPS BETWEEN PARTNERS

This section is based on the question which asks about people's overall assessment of their relationship with their partner[2]. Responses to this question are positively correlated with favourable answers to the other questions about the relationship (e.g. those who exchange ideas and calmly discuss something more often rate their happiness with the relationship higher).

[2] The exact wording of the question is as follows: 'The boxes on the following line represent different degrees of happiness in your relationship. The middle point, 'happy', represents the degree of happiness of most relationships. Please tick the box which best describes the degree of happiness, all things considered, of your relationship.' Respondents rate their happiness on a seven-point scale. However, the three categories at the unhappy end of the scale are very sparsely populated, so for this analysis we have grouped these categories into a single 'unhappy' category.

Figure 1 compares the reports of married women with those of women in cohabiting unions. Cohabiting women are more likely to report happiness at the extremes of the distribution — unhappy or perfectly happy — than married women. However, the association between cohabitation and high levels of happiness partly reflects the fact that cohabitations are predominantly found among younger people (half of the cohabitors were younger than 35 years, compared with only 13% of married individuals) and are typically of much shorter duration than marriages (56% of those cohabiting had a relationship duration of less than 5 years, compared to only 8% of those who were married), – and both of these factors are associated with higher levels of relationship satisfaction.

Figure 2, which shows the association between relationship duration and happiness, illustrates this point. For both men and women, happiness declines with the duration of the relationship, but the decline is steeper for women than for men. It is also the case that older people are less happy in their relationships than younger people (results not shown).

For both men and women, happiness declines with the duration of the relationship

In order to properly assess the nature of the link between relationship satisfaction and whether the couple is married or cohabiting, net of other factors like age and relationship duration, we perform multivariate analysis. As well as including age, relationship duration and whether the couple is married or cohabiting, we control for gender, the number of children, the age of youngest child, educational qualifications, employment status and household income (gross, monthly).

When we control for these other characteristics, we find that cohabiting people are significantly less happy in their relationships than married people, and that women are less happy in their relationships than men; the association between education and relationship quality shown in Figure 3 is also robust to controlling for other factors.

We also find that better educated people are happier with their relationship, as Figure 3 illustrates. Income was unrelated to relationship happiness among men, and was only mildly important for women. Only women in the highest income quintile were significantly happier than those in the lowest income quintile. This association between education and relationship satisfaction was stronger for women than men, and is consistent with the fact that better educated women are less likely to dissolve their relationships (Ermisch, 2006).

Figure 1 Women's degree of happiness with relationship

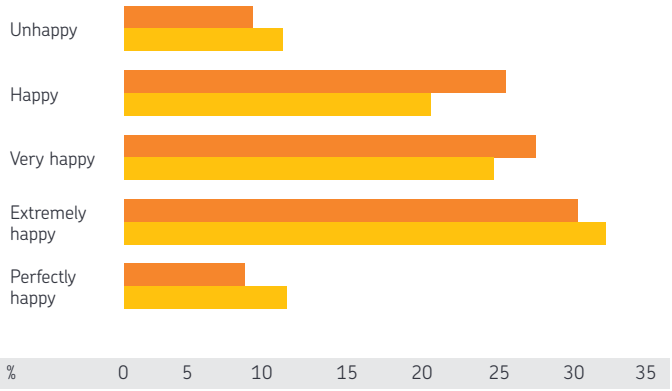


Figure 2 Percentage of people who report their relationship as extremely happy or perfect by duration of partnership

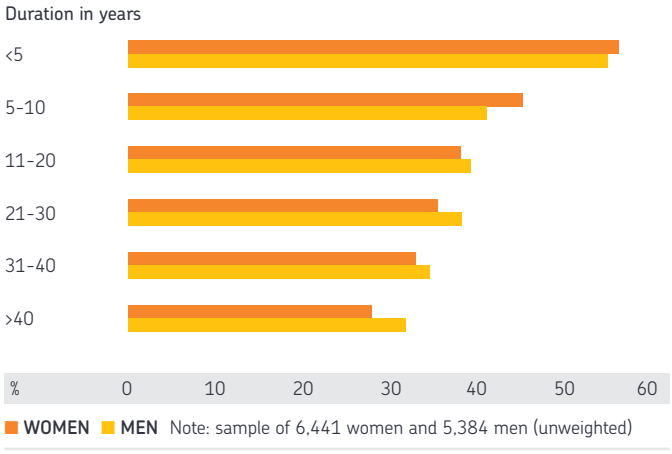
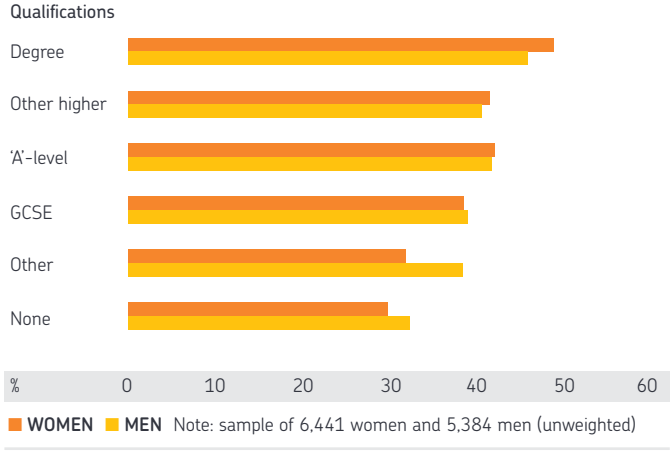


Figure 3 Percentage of people who report their relationship as extremely happy by academic qualifications



Over 60% of children aged 10-15 are completely satisfied with their family situation

Our multivariate analysis also indicates that, other things being equal, childless couples are happiest with their relationships and those with a pre-school child are least happy, with happiness increasing with the age of the youngest child. Among men, being out of employment was associated with lower levels of happiness in their relationship with their partner.

RELATIONSHIPS BETWEEN PARENTS AND CHILDREN

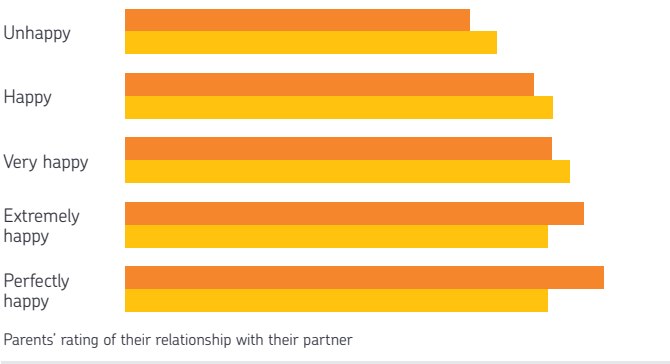
As well as providing insights into the relationships between adult partners, the data in *Understanding Society* also allow us to study relationships between parents and children. In particular, it allows us to analyse the quality of relationships as reported by parents, together with the quality as reported by their children. Figure 4 shows that young people's satisfaction with their family situation is clearly related to the quality of their parents' relationships. For young people who have both a mother and a father figure resident in the household, Figure 4 plots the percentage of young people who say they are 'completely happy' with their family situation, by their mother's rating of her relationship with the child's father figure.

The first noticeable aspect of Figure 4 is that young people are in general very happy with their family situation – well over 60% say they are 'completely satisfied' in this respect. However, the percentage does vary systematically with the quality of the parental relationship. In families where the child's mother is unhappy in her partnership, only 55% of young people say they are 'completely happy' with their family situation – compared with 73% of young people whose mothers are 'perfectly happy' in their relationships. Young people's satisfaction with their family situation also varies by their fathers' assessment of partnership quality. The relationship here is less pronounced, but there is still around a 10-percentage point difference between young people whose fathers are 'unhappy' in their relationships, and those whose fathers are 'happy' or better.

The youth questionnaire contains information on several other aspects of the parent/child relationship which may have an effect on young people's well-being. We performed multivariate analysis, again of the probability that a young person is 'completely happy' with his or her family situation, using the following set of explanatory variables: the young person's age and sex; whether the child lives in a two-parent family, a lone-parent family, or a step-family; the number of older and younger siblings in the household; the frequency that the child (a) quarrels and (b) discusses important matters with his or her mother; and the corresponding frequencies for fathers, where the child has a father figure. We also looked at how long children spent watching television, and how often they ate an evening meal with their family.

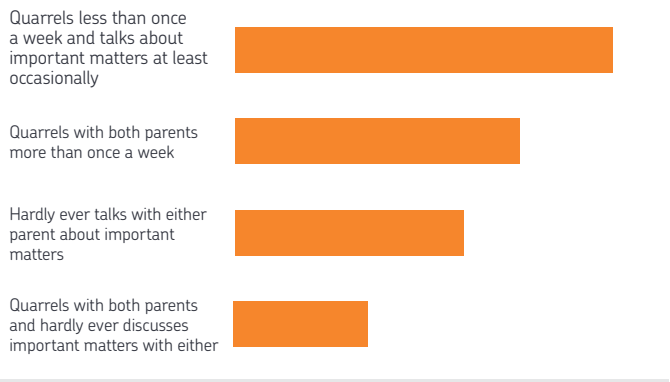
We found no difference between boys and girls, but a significant effect of age. Older children were substantially less likely than younger children to rate themselves as completely happy with their families. There was no significant difference between children living with both biological parents and children in step-families, although children in lone-parent families were less likely to report themselves completely happy with their situation. Siblings also appear to matter: having older siblings was not related to children's happiness with their family situation, but having younger siblings in the household was associated with lower levels of satisfaction – and this effect is greater the larger the number of younger siblings present in the household.

Figure 4 Percent of young people who are completely happy with their situation, by their parents' perception of their relationship with their partner



Note: based on 1,268 young people aged 10-15 (unweighted)

Figure 5 Predicted probability that a child is completely happy with family life, by relationship with parents



Note: sample of 2082 young people ages 10-15 (unweighted)

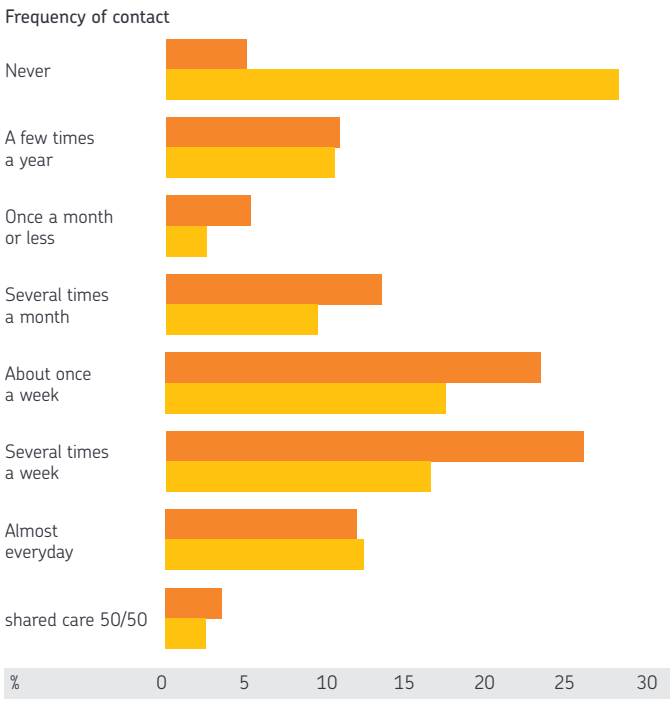
The most important effects, however, are those relating to the frequency with which children quarrel with their parents, and discuss important matters with them[3]. The first column in Figure 5 shows predicted probabilities that a 'typical' 12-year-old child will be completely happy with family life. Children who don't quarrel with either parent more than once a week, and who discuss important matters with one or other of their parents at least occasionally, have a 74% chance of being completely happy with family life. This falls to 56% for children who quarrel with both their parents at least once a week – and to 45% for children who hardly ever discuss important matters with either parent. Children who quarrel more than once a week with their parents, *and* don't discuss important matters with their parents have only a 28% chance of rating themselves completely happy with their families.

65% of fathers who pay child support see their children at least once a week

We found that hours spent watching TV are completely unrelated to a young person's happiness with their family situation. However, eating an evening meal together as a family is important: children who eat an evening meal with their family at least three times a week are substantially more likely to report being completely happy with their family situation than children who never eat with their family, or who eat together less than three times a week, reflecting the findings of a number of studies in this area (Fulkerson, Story, Mellin, Leffert, Neumark-Sztainer & French, 2006, Eisenberg, Olson, Neumark-Sztainer, Story & Bearinger, 2004).

Of course, not all children live with both their parents; a growing number of children live in a different household to one or both parents, particularly their father. *Understanding Society* contains data on these non co-resident relationships; non-resident fathers are included in questions to children on their relationships with their parents, and parents are asked about the payment of child support and the frequency of contact with their children. Figure 6 shows the frequency of contact for fathers with a dependent child living elsewhere. This distribution varies considerably between the two-thirds of fathers who pay child support and the one-third who do not[4]. Over one quarter of fathers who pay child support see their children several times a week, and a further 23% see their children about once a week. But of fathers who do not pay child support, 28% never see their child, and less than a third see them several times a week or more.

Figure 6 Contact between fathers and non-resident dependent children by payment of child support



Note: sample composed of 474 men with a child living elsewhere (unweighted)

FUTURE WORK

It is increasingly recognised by both social researchers and policy makers (e.g. all the main political parties in the UK) that parents' relationships between each other and with their children are important for children's cognitive and emotional development and the stability of families. This includes not only what parents do for and with their children, but also the values, beliefs and motivation that are instilled by parents in their children. To take a concrete example, the current UK government is actively interested in evidence and policy ideas to support couple relationships. This chapter illustrates the rich potential for family research which *Understanding Society* offers. It is evident that even with only a single wave of data, many interesting questions may be addressed; as the same households are interviewed year after year, the scope for research will grow and grow. There is not space to list all the potential research questions which might be addressed using *Understanding Society*. But here are a few.

In this chapter, we have looked separately at men's and women's satisfaction with their relationships – but we have not examined how they are related *within* relationships. We might expect partners' levels of satisfaction to be highly correlated with one another – but how far is this really the case?

[3] Both of these variables – quarrelling with one's parents and discussing important matters with them – are related to factors including parents' educational status, age and marital status. These factors are much more pronounced in relation to the mother than the father. However, this analysis shows that the quality of a child's relationship with his or her parents has a strong effect on his or her satisfaction with family life, even when these other factors are taken into account.

[4] The percentage paying child support is very similar to that found in BHPS data, in which questions about child support occur in the financial section of the questionnaire. For example, see Ermisch (2008).

And as we observe families over time, we will be able to ask how life events are related to relationship quality in a dynamic context. For example, we already know that unemployed men are on average less happy in their relationships than men with a job. But what happens to relationship satisfaction when an unemployed man *gets* a job? We already know that people with small children are less happy in their relationships than people without children. But again, once longitudinal data become available, we will be able to analyse in detail the changes in relationship quality which come about when a baby is born – and perhaps, to identify other factors which would help us to identify couples who are particularly at risk of suffering relationship stress on the birth of a baby.

As time goes on, we will be able to assess the effects of relationship quality on a couple's children

We will also be able to study how relationship quality affects life events. You don't have to be a top social scientist to predict that couples who are less happy in their relationships are more likely to split up as time goes on. But what drives this? Do certain aspects of relationship quality predict separation better than others? Is the woman's dissatisfaction with the relationship a more important predictor of separation than the man's, or vice versa? Is separation more likely when both partners are unhappy? Or is it equally likely to occur when just one partner is unhappy in the relationship?

As time goes on, we will be able to assess the effects of relationship quality on a couple's children. We might ask, for example, how well the quality of the parental relationship affects outcomes for their children, like academic success, performance in the job market, mental health, or, after a decade or so, the children's own experiences of partnership and family life.

As well as information on the parents' own relationship, *Understanding Society* also includes questions about the parent/child relationship from the perspectives of both parents and children – and questions about parenting styles. In a dynamic context, we will be able to see how parents' attitudes and parenting styles evolve over their lives as parents; how the parent/child relationship evolves over time; and how all these factors, and others, such as employment, income, attitudes, social participation, health, and the many other facets of life on which *Understanding Society* provides information, interact to shape the lives of a generation who are now children, but will form the next generation of adults.

Sample Size

After excluding those with missing information on the key measures 6,441 women and 5,384 men who were married or in a cohabiting partnership were included in the analysis. The youth questionnaire is self-completion and completed by the young person in confidence. Of the 2,163 young people and after excluding those with any missing information on the key measures, 2,082 young people were included in this analysis. The data are weighted to take account of design effects in the sample.

Findings

For both men and women, overall happiness with their partnership declines with the duration of the relationship, but the decline is steeper for women than for men. When we control for other characteristics, cohabiting people are significantly less happy in their relationships than married people, and that women are less happy in their relationships than men. In addition, other things being equal, childless couples are happiest with their relationships and those with a pre-school child are least happy.

Among men, being out of employment was associated with lower levels of happiness in their relationship with their partner. Income appears to be unrelated to relationship happiness among men, and is only mildly important for women. Only women in the highest income quintile are significantly happier than those in the lowest income quintile.

Over 60% of children aged 10-15 are completely satisfied with their family situation, but in families where the child's mother is unhappy in her partnership children are less likely to be completely happy with their family situation. Children's satisfaction also varies by their fathers' perception of the partnership.

Two measures of communication with parents, frequency of quarrelling and discussion of important matters are among the factors most strongly related to the probability that a young person is 'completely happy' with his or her family situation.

Having older siblings was not related to children's happiness with their family situation, but having younger siblings in the household was associated with lower levels of satisfaction – and this effect is greater the larger the number of younger siblings present in the household.

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LIFE SATISFACTION AND MATERIAL WELL-BEING OF YOUNG PEOPLE IN THE UK

Gundi Knies

INTRODUCTION

Policymakers across the world increasingly recognise the importance of life satisfaction as a desirable individual outcome at all stages of the life cycle. Policy attention with respect to children's well-being has largely focused on improving the financial position of families with children. A new indicator of child poverty has been proposed, intended to measure differences in children's circumstances closely linked to their well-being (Willitts, 2006). Using data from *Understanding Society*, this chapter investigates whether the new material deprivation measures of child poverty, introduced to help target effective policies that make a real difference to children's lives, do affect the self-perceived life satisfaction of children living in the UK.

PREVIOUS RESEARCH

Life satisfaction refers to a cognitive process in which individuals evaluate the quality of their life. It is 'a reflective appraisal, a judgment, of how well things are going, and have been going' (Argyle, 2001, p. 39). External factors play an important role when people make this appraisal. For instance, happiness research has shown that married people are happier than those who have never been married, are divorced or widowed; and employed people are more satisfied with their life than unemployed people (Layard, 2005). The relevance of external factors can be linked to the philosophical assumption that there are universal needs which have to be met in order for people to be happy, and people who find themselves in a 'good situation' for the fulfilment of needs are happy, while those who find themselves in a 'bad situation' are unhappy (e.g. Diener, Sandvic, Seidlitz & Diener, 1993).

Previous research on life satisfaction in children has provided some insights both into how satisfied children are with their life and which factors in their lives matter. Compared with their peers in other countries, children in the UK rank low on life satisfaction (Bradshaw & Richardson, 2009; United Nations Children's Fund, 2007). Low life satisfaction in children is correlated with low levels of self-reported health and with low levels of satisfaction with their family. In Scott and Chaudhary's (2003) analysis of free text answers of children aged 11 to 15 years, they find that when asked about one thing they would like to change in their life for it to improve, many children mention family-related issues: they would like separated parents to reunite, or to live with the absent parent or have less conflicts with siblings.

Shifting the focus to other factors that affect children's life satisfaction, Powdthavee and Vignoles (2008) find that not living in a household with both their biological parents and with higher numbers of other children reduces children's life satisfaction. Furthermore, there appear to be age and gender differences. Among all children in the UK, it is those aged 13-15, and among them girls in particular, who are unhappiest with their life overall (Bradshaw & Keung, 2010; Scott & Chaudhary, 2003. In Canada, Burton and Phipps (2010a) found a negative relationship between minority ethnic background and life satisfaction among children which the authors suggest is attributable to the lower income position of minority ethnic group households.

The relationship between life satisfaction and family income has not been analysed for children in the UK. To the extent that a basic sustainable income is essential if individuals are to have access to resources needed to fulfil basic needs and participate in mainstream society, we may expect a positive relationship between income and life satisfaction. This has been well documented in the research on life satisfaction in adults (Diener, Suh, Lucas & Smith, 1999; Ferrier-i-Carbonnell, 2005). The relationship between income and life satisfaction may not be as strong for children (Burton & Phillips, 2010b). Unlike adults, children may not view their family's income as a sign of their personal success and may not know the family income. They are also less likely to have an insight into the family finances and may misjudge the affluence of their family, particularly if living in an area where their peers come from households with similar income levels. In addition, there is empirical evidence that parents shield their children from financial hardship by spending on their children rather than themselves (Middleton, Ashworth & Braithwaite, 1997). Children's assessment of their family's financial situation may blur the association between family income and life satisfaction that is found for adults.

The comparatively low levels of life satisfaction in children living in the UK may also be explained by the relatively high prevalence of child poverty. Children are, according to scientific convention for international comparisons, poor if they live in a household with a needs-adjusted income that is below 50% of the median income in their

country. In 2000, 16.5% of children aged 0-17 living in the UK were living in a poor household. Among 24 member countries of the Organisation for Economic Co-operation and Development (OECD), this rate was topped only by the United States of America where 22% of all children in this age group lived in poverty (United Nations Children's Fund, 2007). Using the conventional measure of household income, child poverty rates in the UK have been falling from 22% in 1998-1999 to 11% in 2008-2009 (Department for Work and Pensions, 2010).

More recently, organisations such as OECD, the European Union and the UK Department for Work and Pensions (DWP) have adopted a new approach to measuring child poverty based on material deprivation. The new measures consider whether children are excluded from mainstream society due to poverty. In this framework, children who have the same standard of living as other children despite living in a family on a low income would be considered non-poor.

It has been suggested that living in an income-poor household and also not being able to afford things that most people consider necessary for adults and for children to participate in mainstream society represents a child poverty measure that is better suited to capture such differences that make a real difference to children's quality of life (Willitts, 2006). While recognising the potential importance of material deprivation measures as indicators of living standards that improve our understanding of social exclusion, the approach of preferring these measures over income as a measure of poverty has been questioned by some (Berthoud, Blekesaune & Hancock, 2006).

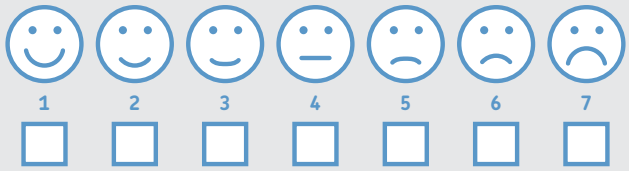
Understanding Society provides these new markers of child poverty alongside children's own accounts of how satisfied they are with their life, allowing us to investigate empirically whether the material deprivation measures do indeed capture differences in the self-perceived quality of life of children as measured by their overall life satisfaction.

DATA AND KEY MEASURES

Interviews with young people aged 10-15 living in sample households are an integral part of *Understanding Society*. The *Understanding Society* Youth Questionnaire sample currently contains data from 2,163 young people aged 10-15 years. Information is collected using a self-completion questionnaire, which in Wave 1, focused on health, health behaviour, school, friends, aspirations for the future, behavioural and psychological well-being, and family relationships. We use information from the *Understanding Society* youth sample and augment it with information on their family's material well-being, which is available from interviews with an adult in the household.

Our key outcome variable, overall life satisfaction or happiness, is collected using a 7-point scale where categories are represented by more or less smiling faces. Participants are asked to tick the box which best describes how they feel about their life as a whole (Figure 1). For ease of interpretation, the analysis reverses the coding of the information so that higher values on the scale represent greater satisfaction.

Figure 1 Life satisfaction measure



There are three measures of young people's material situation. The first is a measure of gross usual monthly household income equivalised to allow for household size. We exclude from the analysis households with zero or negative household income, and those above the 99th percentile of the household income distribution. The average household income quintiles for households with children aged 10-15 years range from the lowest quintile of less than £1,102 per month to the highest quintile of more than £3,998 per month.

In addition, two indices of material deprivation, also used by the DWP, designed to measure the more permanent financial strain on families with children are used. The first index, the Household Material Deprivation Index (HMDI), measures the material deprivation of adults in the household. In each household an eligible adult is asked:

Do you (and your family partner) have...

- A holiday away from home for at least one week a year, whilst not staying with relatives at their home?
- Friends or family around for a drink or meal at least once a month?
- Two pairs of all weather shoes for all adult members of the family?
- Enough money to keep your house in a decent state of repair?
- Household contents insurance?
- Enough money to make regular savings of £10 a month or more for rainy days or retirement?
- Enough money to replace any worn out furniture?
- Enough money to replace or repair major electrical goods such as a refrigerator or a washing machine, when broken?

The response categories for each of these questions are (1) I/we have this (2) I/we cannot afford this (3) I/we do not need/want this. When a respondent felt this question was not applicable to them this was coded to (4) not applicable (spontaneous).

To generate the HMDI, each household that cannot afford the item is assigned a value of 1 (all others: 0), multiplied by the proportion of the population that has the item, then summed and divided over the total number of items. The idea behind weighting the item by the proportion of the population that has the item is that not having it may have a greater impact the more people have it. The index can range from 0 to 1, with 1 representing a household lacking all items that everybody else has. The mean HMDI score for our sample is 0.17.

The second index, the Child Material Deprivation Index (CMDI), is calculated over 9 items relating to children's material deprivation. The adult responsible for children aged 0-16 in the household is asked whether (all) child(ren) have or do:

- A family holiday away from home for at least one week a year?
- Enough bedrooms for every child of 10 or over of a different sex to have their own bedroom?
- Leisure equipment such as sports equipment or a bicycle?
- Celebrations on special occasions such as birthdays, Christmas or other religious festivals?
- Go swimming at least once a month?
- A hobby or leisure activity?
- Have friends around for tea or a snack once a fortnight?
- Go to a toddler group, nursery or playgroup at least once a week?
- Go on school trips?

The response categories are:
(1) Child(ren) have this
(2) Child(ren) would like this but I/we cannot afford this
(3) Child(ren) do not need/want this
When a respondent felt this question was not applicable to them, this was coded to (4) not applicable (spontaneous).

The Child Material Deprivation Index (CMDI) is calculated and interpreted in the same way as the HMDI. The mean CMDI score for our sample is 0.06.

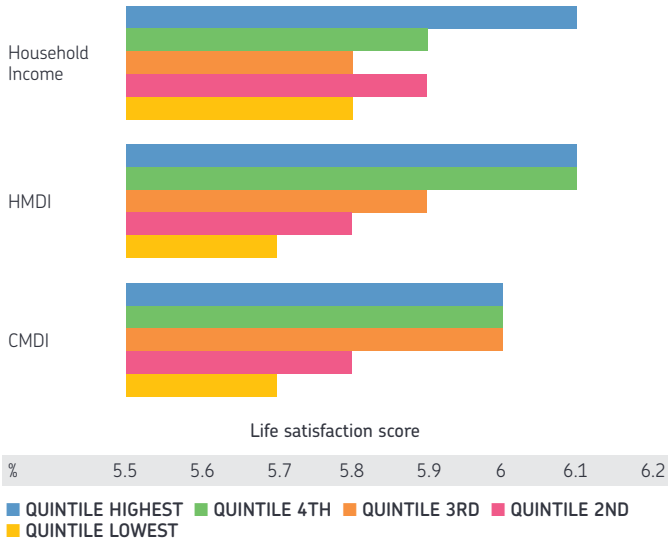
Basic socio-demographic characteristics including age, sex, ethnicity, the number of biological parents in the household, and total number of children aged 0-15 in the household were used to control for some of the variation in the youth life satisfaction scores. All results are weighted using *Understanding Society* design weights.

RESULTS

Overall, 10-15 year-olds in the UK appear to be very satisfied with their lives. Their mean life satisfaction score is 5.9 (out of a total possible of 7). 70% of young people ticked one of the two categories representing greatest life satisfaction; about four percent selected one of the three categories reflecting least life satisfaction. This distribution matches that found in other surveys such as the British Household Panel Survey (Bradshaw & Keung, 2010; Scott & Chaudhary, 2003), young people's mean life satisfaction by quintile group of household income, the household material deprivation index (HMDI) and the child material deprivation index (CMDI). Young people in materially better-off households report, on average, higher life satisfaction. The average life satisfaction score of those living in households with an income in the bottom quintile group of the distribution is 5.8, while that of youths in the top quintile group is 6.1. Statistically significant differences in mean life satisfaction only exist between the top and the bottom two quintile groups. Young people report lower life satisfaction the higher their household scores on the HMDI i.e. the greater the material deprivation of the household. There are statistically significant differences in mean life satisfaction between those in the bottom and the top two household income quintile groups on the HDMI.

By contrast, there is no clear association between the CMDI and young people's life satisfaction by income quintile group. Using the CMDI measure, young people in the most deprived quintile group are significantly less satisfied with their life than those in the bottom quintile group (5.7 compared to 6.0, respectively), but are also significantly less happy than youths in the 3rd quintile group.

Figure 2 Young people's life satisfaction by quintile groups of household income, household material deprivation index (HMDI) and child material deprivation index (CMDI)



ACCOUNTING FOR OTHER CHARACTERISTICS

The relationships between household income, the HDMI and CMDI and life satisfaction described above may be due to other individual or household characteristics. To account for these, a multivariate regression model was estimated. The model controls for basic socio-demographics and family composition which previous research has suggested influences the life satisfaction of children (Table 1).

The results suggest that the association between life satisfaction and age or gender is not statistically significant once other factors are considered. Young people living in England are less satisfied with their life than those living in other UK countries, life satisfaction is higher for those living with both their biological parents, and is lower as the number of children in the household increases. Interestingly, there is a positive association between ethnicity and life satisfaction for those who consider themselves as belonging to a minority ethnic group, even though the results are not statistically significant.

Childhood material deprivation is defined as not being able to have things most people consider a necessary part of participating in society

After controlling for other factors, there is no association between young people's life satisfaction scores and household income, and none with either the household or child material deprivation indices. A number of alternative specifications were tested to check the robustness of this result. For example, to explore the conjecture that young people may not care about the extent of their material deprivation relative to others but about whether or not their family cannot afford things perceived by the majority of the population as necessary, the material deprivation indices were constructed without weighting individual items by the share of the population that has the item. A deprivation index over all household and child items (both weighted and not weighted by the population share that has the items), and including a marker for whether the family's income is below the poverty line, was also tested. None of this yielded statistically significant associations between young people's material situation and their life satisfaction.

Finally, the items of the CMDI were included individually, and the responses 'we cannot afford this' and 'children do not need/want this' recoded to a new category of 'children do not have/do this' (reported in Table 2). The aim was to test whether there is an effect on children's life satisfaction

Table 1 Predictions of life satisfaction in young people (ordinary-least-squares regression)

	Coeff.
Age	ns
Gender	ns
British/Irish White	ns
Lives in England	-0.23**
Number of biological parents in household	0.29***
Number of children in household	-0.11***
Household income/1000	ns
Household Material Deprivation Index	ns
Child Material Deprivation Index	ns
N	2,005

**p<.01; ***p<.001; ns – not significant

Table 2 Predictions of life satisfaction in young people using child material deprivation index items (Ordinary-least-squares regression)

	Child material deprivation operationalised as...	
	Cannot afford item Coeff.	**Does not have item Coeff.**
Age	ns	ns
Gender	ns	ns
British/Irish White	ns	ns
Lives in England	-0.23**	-0.23**
Number of biological parents in household	0.29***	0.29***
Number of children in household	-0.11***	-0.12***
Household income/1000	ns	ns
Household Material Deprivation Index	ns	ns
Child material deprivation items		
holidays	-0.02	-0.12
own bedroom	0.04	0.03
leisure equipment	0.04	-0.05
celebrations	-0.02	-0.09
swimming	-0.15	-0.04
a hobby	-0.14	-0.25
friends around	-0.44	-0.21*
toddler group	-0.91	-0.74
school trips	-0.21	-0.31
N	2,005	2,005

*p<.05; **p<.01; ***p<.001; ns – not significant

of not having or doing what others perceive as necessary, rather than the family not being able to afford the item or activity. This conjecture is partly confirmed by the empirical finding that the item 'children do not have friends around' is negatively associated with young people's life satisfaction. Otherwise the empirical results are the same across model specifications.

DISCUSSION

New measures of child poverty have been introduced to help target effective policies that make a real difference to children's lives. An increasingly popular way to assess what makes a real difference to people's lives is to show its relation to life satisfaction. The research presented here suggests that the new child poverty measures are not associated with children's life satisfaction. This implies that any policy improvements based on this child poverty measure may not represent real improvements in quality of life as they are perceived by children themselves.

It may be that the family's material situation affects children's life satisfaction more indirectly, for instance, through the kind of food children consume, the range of leisure activities they can undertake, the quality of neighbourhoods and schools they are exposed to, and, perhaps most importantly, through the socio-emotional and psychological effect on the relationships between family members (Kempson, 1996). For example, in Chapter 4 by Wolke and Skew, we can see the impact of other elements in adolescents' lives such as bullying both at home and at school and the effect this has on increasing behavioural problems and reducing life satisfaction. The explanation for young people's life satisfaction is likely to be more complex than can be measured by the material deprivation indices alone even though these remain valuable measures for increasing our understanding of disadvantage and poverty.

Understanding Society offers information to investigate each of these aspects in a comprehensive life satisfaction model for a specific group of children, namely youths aged 10-15 years. Once planned data linkages to administrative health records and administrative education records have been undertaken, it will be possible, for instance, to tease out the effects on life satisfaction which objective differences in education and health make to children's lives. The analysis of life satisfaction in youths will also benefit from repeated observations over time on a larger sample, including the ethnic minority boost sample. It is known that people tend to overstate how satisfied they are with their lives when confronted with this type of question for the first time (Frick, Goebel, Schechtman, Wagner & Yitzhnki, 2004) and the longitudinal design of *Understanding Society* will allow us to hold constant unobserved characteristics that may influence life satisfaction reports as the sample of young people matures into adulthood.

There is no clear association between the child material deprivation index and life satisfaction among youth

This age group represents an important segment of children in poverty. Children aged 10-15 represent 10% of the population living in poverty and 33% of all children in the UK. However, there is no association between the new material deprivation measures of poverty and life satisfaction for this age group. One reason may be that the selection of items for the CMDI is more relevant for younger children. Note for example, the inclusion of an item about toddler groups or playgroups which may be highly relevant at younger ages but not for the age group in this analysis.

The use of life satisfaction to assess whether policies contribute to real improvements in children's lives and to an increase in their well-being should be a priority for public policy. The foundations for a comprehensive policy to improve young people's immediate or current quality of life policy would not only focus on preparing young people for a future role in the labour market through education and training, but also provide them with positive things to do in their leisure time. Youth represent a major age segment of children with distinct needs and requirements for well-being.

Sample Size

The *Understanding Society* Youth Questionnaire was completed by 2,163 young people aged 10-15 years in the four UK countries: in England there were 1,672 young people, 97 in Wales, 176 in Scotland, and 211 in Northern Ireland. The Youth Questionnaire is self-completion and completed by the young person in confidence. The household income measure is derived from all adult interviews within the household and the material deprivation indices are reported by one eligible adult in each household. Of the 2,163 adolescents and after excluding those with any missing information on the key measures, 2,005 young people were included in this analysis. The data are weighted to take account of design effects in the sample.

Findings

Young people aged 10 – 15 years in the UK generally have high levels of life satisfaction. Their mean life satisfaction score is 5.9 (out of a total possible of 7). 70% of young people ticked one of the two categories representing greatest life satisfaction; about four percent selected one of the three categories reflecting least life satisfaction.

Young people in higher income households report, on average, higher life satisfaction. Young people report lower life satisfaction the higher their household scores on the Household Material Deprivation Index. In contrast, there is no clear association between the Child Material Deprivation Index and young people's life satisfaction. However, when controlling for demographic and household factors, we find no associations between young people's life satisfaction scores and household income or with household or child material deprivation indices.

The results suggest that children's life satisfaction is affected indirectly, for example through the kind of food children consume, the range of leisure activities they can undertake, the quality of neighbourhoods and schools they are exposed to, and through the socio-emotional and psychological effect on the relationships between family members. The explanation for young people's life satisfaction is likely to be more complex than can be measured by the material deprivation indices alone even though these remain valuable measures for increasing our understanding of disadvantage and poverty.

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BULLIED AT HOME AND AT SCHOOL: RELATIONSHIP TO BEHAVIOUR PROBLEMS AND UNHAPPINESS

Dieter Wolke | Alexandra J. Skew

INTRODUCTION

This chapter investigates bullying involvement at home (sibling bullying) and at school in a representative sample of children within families. Sibling bullying was found to be widespread and more frequent than bullying by peers in school. Gender differences were small for sibling bullying and contrary to previous evidence, not found for school bullying. Family and sibling type had some but only a small impact on sibling or school bullying. While the prevalence of sibling bullying was high across adolescence, school bullying reduced from 10-15 years of age. Contrary to some previous reports, not only physical but also relational bullying reduced during adolescence in school. Involvement in bullying at home between siblings and victimisation at school was related to increased unhappiness and more behaviour problems. We found a dose-response relationship with children who were bullied *both* at home and at school had the strongest association with behaviour problems (up to 14 times increased) and were the least happy compared to those not victimised in either context.

PREVIOUS RESEARCH ON BULLYING

The intensive research on bullying over the last three decades can be traced to 1982 when three young boys killed themselves in short succession in Norway, each leaving notes that they had been whipping boys, bullied by their peers (Stassen Berger, 2007). Many more suicides attributed to bullying have occurred worldwide since then (Kaminski & Fang, 2009). Apart from suicide, being a victim of bullying increases the risk of a range of adverse outcomes including increased physical health problems (Gini & Pozzoli, 2009; Wolke et al., 2000), more behaviour and emotional problems (Wolke & Sapouna, 2008); a higher risk for psychotic symptoms (Schreier et al., 2009) and poorer school performance (Woods & Wolke, 2004). Bullying and victimisation is a serious public health problem.

Bullying victimisation refers to children being exposed *repeatedly and over time*, to *negative actions* on the part of one or more other children *who are or perceived to be stronger* (Olweus, 1993). It is a systematic abuse of power (Smith & Sharp, 1994). Bullying can be physical or direct including verbal abuse, hitting, kicking, destroying others' belongings or blackmail. In contrast, relational bullying refers to deliberate social exclusion of children such as ignoring, excluding them from games or parties, spreading gossip or humiliation (Wolke et al., 2000). Direct bullying is more frequent at younger ages and decreases with age. It has been suggested that relational bullying increases in adolescence. Those subjected to both direct and relational bullying on a regular basis appear to be at the highest risk for adverse outcomes (Crick, Ostrov & Werner, 2006; Wolke et al., 2000).

Bullying is one way to gain social status and a powerful dominant position in the peer or sibling group. Individuals who are dominant have better access to material and social resources (the most wanted toy, best role in a game, sexual attention) (Salmivalli, 2010). Not all bullies are the same (Haynie et al., 2001). There is a small group of so-called 'pure bullies' (prevalence: 2-5%). These bully others but are not victims themselves. Their approach is labelled 'cool cognition' due to their lack of empathy for others (Sutton, Smith & Swettenham, 1999). Other bullies are called 'Bully-victims' because they are victimised themselves and at other times bully others (prevalence 5-10%) (Wolke et al., 2000). Bully-victims have been reported to be most at risk for behaviour problems and low self-esteem (Sourander et al., 2007). Any child can become a victim (estimated as between 12-25%), but those who remain victims are often more anxious, submissive, withdrawn or physically weak, easily show a reaction (e.g. run away, start crying, scream for help), have poor social understanding (Woods, Wolke, Novicki & Hall, 2009) and no or few friends who can stand up for them (Wolke, Woods & Samara, 2009).

By middle childhood, children spend as much, if not more, time interacting with siblings than with parents (Kim, McHale, Crouter & Osgood, 2007). In many families aggression between siblings is frequent and a source of great concern to parents (Dunn & Herrera, 1997). Duncan (1999a) reported that 30% of children with siblings were frequently bullied by their siblings with some 8% reporting that they were scared of being hurt badly by their sibling. Around 40% of children also admitted to bullying their brothers or sisters. Children may learn particular behaviours in relationships with their parents and siblings, and these behaviours then generalise to their interactions with peers and friends (MacDonald & Parke, 1984). Indeed, those bullied by siblings have been reported to be more likely to be involved in bullying at school (Duncan, 1999a; Wolke & Samara, 2004). Thus children who are bully-victims at school and involved in bullying at home may have the highest levels of psychological pathology. It is surprising that sibling bullying has been relatively ignored in the literature, perhaps because it is so common. Overall, the adverse effects of bullying involvement appear to be more likely or

stronger if children experience several types of bullying (i.e. relational and physical), it occurs in different contexts, (i.e. at home and in school), or they are both bullies and victims.

This is the first study to investigate sibling and peer bullying in a representative national household sample. The analysis focuses on family factors related to sibling and school bullying and investigates whether those involved in both sibling and school bullying are at the highest risk for adverse behavioural outcomes.

SAMPLE AND MEASURES

The *Understanding Society* Youth Questionnaire was completed by 2,163 adolescents aged 10 – 15 years in the four UK countries (participants from England: 83.7%; Wales: 4.9%; Scotland: 8.8% and Northern Ireland: 2.6%). The questionnaire is self-completion and answered by the young person in confidence. Of the 2,163 adolescents, 1,872 (87%) had siblings but 43 had missing information on the sibling questions and seven had missing information on the school bullying questions. Altogether 2,114 adolescents could be included in the analysis of combined school and sibling bullying. Those who had no siblings were included in the analysis and coded to reflect no sibling bullying. The distribution by age was fairly even with approximately 350 adolescents in each age year (Table 1). Fifty-seven percent lived with both biological parents, 29% with one biological parent, 13% with a step parent and 2% were living with no biological parent (Table 1). Of those with siblings, 10% were half siblings and 3% step siblings. Of those with siblings, 51% had one sibling, 33% two, 12% three and 4% four or more siblings. Of the respondents with siblings, 40% were the eldest, 38% the youngest sibling with 23% a middle child or co-twin (Table 1). The highest academic qualification held by either parent or the main carer and household income distribution (income quintiles based on the total sample of those aged 16 years and more) are shown in Table 2.

BULLYING MEASURES

Bullying over the last 6 months was assessed with previously used and well validated questions.

Sibling Bullying

Firstly, the participants were asked about victimisation during the last six months: *'How often do any of your brothers or sisters do any of the following to you at home?'* The response categories and frequency of responses are shown in Table 3. Secondly, they were asked about bullying perpetration against their siblings: *'How often do you do any of the following to your brothers or sisters at home?'* Those adolescents who had experienced or perpetrated one or more of these behaviours *quite a lot* (more than 4 times in the last 6 months) or *a lot* (a few times every week) were considered victims or bullying perpetrators (Wolke & Samara, 2004). Four groups were constructed: *neutral:* neither or rarely bully or victim, *victim:* quite a lot/a lot victimised but no bullying perpetration; *bully-victim:* both quite a lot/a lot victims and bully; *bully:* quite a lot/a lot perpetrator but not a victim.

School Bullying

The participants were asked if they had been physically bullied: 'How often do you get physically bullied at school, for example getting pushed around, hit or threatened or having belongings stolen?' or relationally bullied: 'How often do you get bullied in other ways at school such as getting called names, getting left out of games, or having nasty

Table 1 Characteristics of the youth sample

Characteristic	Unweighted N	Weighted %
Country		
England	1,677	83.7
Wales	98	4.9
Scotland	176	8.8
Northern Ireland	212	2.6
Age		
10 years	366	16.9
11 years	351	16.3
12 years	355	16.5
13 years	387	17.9
14 years	353	16.2
15 years	351	16.3
Family type		
2 biological parents	1,264	57.3
1 biological parent	606	28.7
1 biological and 1 step parent	262	12.5
No biological parents	31	1.5
Sibling type		
Only biological siblings	1,576	85.6
Step siblings	50	2.9
Half siblings	182	10.2
Other	21	1.2
Number of siblings		
1	932	51.3
2	597	32.8
3	219	11.5
4 or more	81	4.4
Child position		
Eldest	720	39.6
Youngest	692	37.6
Middle/co-twin	417	22.8

stories spread about you on purpose?' (Sapouna et al., 2010). Similarly they were asked whether they had been perpetrators of physical or relational bullying (Table 3). Those adolescents who had experienced or perpetrated one or more of these types of bullying quite a lot (more than 4 times in the last 6 months) or a lot (a few times every week) were considered victims or bullying perpetrators (Wolke et al., 2000). Pupils were classified as whether they were not victims, victims of physical or relational bullying only, or both physical and relational victims.

BEHAVIOUR PROBLEMS AND HAPPINESS

Behaviour Problems

Adolescents also completed the Strengths and Difficulties Questionnaire (SDQ) self-completion version (Goodman, 2001) (www.sdqinfo.org). The SDQ is a well-validated tool that asks questions about five domains of behaviour, namely: conduct problems, hyperactivity, emotional symptoms, peer problems and pro-social behaviour (Goodman, 2001). One item of the conduct scale asks about 'fighting a lot' and one item of the peer problems scale asks if 'other children pick on me or bully me'. We excluded these two items as they refer to potential bullying or victimisation and may inflate correlations between bullying measures and SDQ. Scores from the other conduct problem items, hyperactivity, emotional symptoms and other peer problem items were summed to construct a total difficulties score. Abnormal Total Difficulties (clinical range) were determined as scores greater than the 90th percentile (Goodman, Meltzer & Bailey, 2003) of all *Understanding Society* adolescents with SDQ data at age 10-15 in the Total Difficulties Scale.

Unhappiness

Participants were also asked a series of questions about their happiness: 'The next few questions are about how you feel about different aspects of your life. The faces express various types of feelings. Below each face is a number where '1' is completely happy and '7' is not at all happy. Please tick the box which comes closest to expressing

Table 2 Characteristics of the parents of the youth sample

Characteristic	Unweighted N	Weighted %
Highest academic qualification[1]		
Degree	544	25.4
Other higher	324	15.1
A levels	398	18.8
GCSEs	608	28.6
Other qualification	68	3.2
No qualifications	190	8.9
Household income quintile (gross, monthly)		
1 (<£1102)	203	9.5
2 (£1102-£1870)	358	17.1
3 (£1871-£2778)	454	21.4
4 (£2779-£3998)	516	24.3
5 (>£3998)	592	27.8

Table 3 Frequency of bullying at home and at school

Bullying/victimisation frequency	%[2] Never	% Not much	% Quite a lot	% A lot	% Missing
Sibling victimisation (N=1,872)					
Hit, kick, or push you	34.7	31.0	13.5	17.3	3.5
Take your belongings	49.6	28.0	9.1	8.5	4.8
Call you nasty names	37.0	29.7	11.8	17.7	4.4
Make fun of you	41.0	29.1	11.7	13.7	4.7
Sibling bullying (N=1,872)					
Hit, kick, or push them	37.7	36.1	12.1	10.4	3.9
Take their belongings	57.1	27.2	6.6	3.5	5.6
Call them nasty names	40.4	32.8	12.1	9.7	5.0
Make fun of them	42.7	32.2	11.5	9.5	4.1
School victimisation (N=2,163)					
Physical victimisation	79.0	15.6	2.9	1.9	0.6
Relational victimisation	67.3	21.7	6.2	4.4	0.6
School bullying perpetrator (N=2,163)					
Physical bullying	93.3	5.6	0.5	0.1	0.5
Relational bullying	89.8	9.3	0.5	0.1	0.4

[1] Highest academic qualification takes the education of the most highly educated parent in families with two parents, the education of the parent in one-parent families, and the education of the adult who reports to be responsible for the child, in families with no natural parents.

[2] Unweighted row percentages.

how you feel about each of the following things: A: Your school work?, B: Your appearance?, C: Your family?, D: Your friends?, E: The school you go to?, F: Which best describes how you feel about your life as a whole?'. These scores were reverse coded and combined into an overall happiness scale (alpha 0.73) (Chan & Koo, 2010). Those with scores of less than the 10th percentile of all *Understanding Society* adolescents were considered unhappy.

PREVALENCE OF BULLYING

SIBLING BULLYING

More than half of all siblings were involved in bullying in one form or the other (54%). The most common pattern across the UK was to be both victim and bully (33.6%). The second largest group was victims (16%) and few were pure bullies (4.5%). Details of the responses to the specific questions are shown in Table 3. There were few differences in sibling bullying involvement as victim or bully in England, Scotland and Northern Ireland (Table 4). However, fewer children were involved in sibling bullying overall in Wales (40%). Table 4 shows that individual characteristics were associated with bullying involvement. Boys were more often pure bullies or bully-victims while girls were slightly more likely to be pure victims. Type and prevalence of sibling bullying differed slightly by age during adolescence, i.e. from early to later adolescence. Fewer of those aged 13 and 14 were pure victims but similar percentages of bully victims were found at each age. There was no significant association with family type. However, children in step parent households tended to be slightly more often victims. No relationship between sibling type and sibling bullying was found.

This first report of sibling bullying in a representative sample in the UK indicates that sibling bullying is found in half of all UK households with adolescents, a rate higher than has been reported in the USA, Israel or Italy previously using similar measures (Duncan, 1999b; Wolke & Samara, 2004; Menesini, Camodeca & Nocentini, 2010). Sibling bullying is

Table 4 Association between individual or family characteristics and sibling bullying

	Type of sibling bully				
Individual characteristics	**Pure bully**	**Bully-victim**	**Pure victim**	**Neutral**	**N**
Country*					
England	4.4	34.7	15.7	45.3	1,417
Wales	1.2	21.4	17.9	59.5	84
Scotland	7.1	27.9	18.6	46.4	140
Northern Ireland	4.3	43.1	12.2	40.4	188
Sex**					
Male	5.8	36.0	14.8	43.4	914
Female	3.1	32.8	16.5	47.7	915
Age*					
10 years	5.2	34.6	18.1	42.1	309
11 years	3.1	34.6	19.3	43.1	295
12 years	2.0	32.1	16.7	49.2	305
13 years	5.1	34.4	12.6	47.9	334
14 years	7.1	36.4	10.1	46.5	297
15 years	4.2	34.3	17.3	44.3	289
Family type					
2 natural parents	4.6	32.7	15.6	47.1	1,121
1 natural parent	5.0	38.3	14.1	42.6	462
1 natural and 1 step parent	2.6	36.0	19.7	41.7	228
No natural parents	5.6	16.7	5.6	72.2	18
Sibling type					
Only natural siblings	4.6	34.3	15.4	45.6	1,576
Step siblings	4.0	28.0	18.0	50.0	50
Half siblings	2.8	39.0	17.6	40.7	182
Other	4.8	14.3	9.5	71.4	21

*p <.05 **p <.01

frequent and a third of all adolescents both bully their siblings and are the victims of bullying at the hand of their siblings.

SCHOOL BULLYING

Overall, 12% of adolescents reported being victims of bullying at school, 1.2% physical victims only; 7.1% relational victims only and 3.8% were both relational and physical victims. Only 22 adolescents (1%) reported frequent bullying, thus analysis of bullies or bully-victims was not possible. No gender differences or differences according to the four UK countries in victimisation were found (Table 5). All types of victimisation reduced with age with older adolescents less likely to become victims of either physical or relational victimisation (Table 5). Family type had a weak association with victimisation: children from step families were slightly more often physical and relational victims than children from other types of families (Table 5), a finding also recently reported in another UK sample (Green, Collingwood, & Ross, 2010).

The prevalence of victimisation and the reduction with age found here is remarkably similar to the first such survey of bullying in the UK in 1993 (Whitney & Smith, 1993). While a recent report by the Department for Education using data from the Longitudinal Study of Young People in England (LSYPE) also reported a decrease of victimisation with age in adolescence, the prevalence reported was much higher (Green et al., 2010). Higher prevalence was found because the LSPYE asked about whether bullying behaviour had 'ever' occurred in the last 12 months, a very lenient definition not taking into account the repetitive nature required for defining aggressive acts as bullying. In contrast, very few children admitted to bullying others, a finding replicated in other recent cohorts in the UK (Schreier et al., 2009). It may indicate that efforts to combat bullying in school (Samara & Smith, 2008) have resulted in adolescents being less willing to admit to being perpetrators of bullying in school. Alternatively, asking directly about experiences of bullying rather than individual behaviours (such as in the sibling questions) may have led to less reporting of bullying as it is less socially desirable.

Table 5 Association between individual and family characteristics and victimisation at school

	Type of school victimisation			
Individual characteristics	**Physical & relational**	**Physical or relational**	**Not a victim**	**N**
Country				
England	3.9	8.1	88.0	1,672
Wales	2.1	6.2	91.8	97
Scotland	4.0	11.9	84.1	176
Northern Ireland	2.4	4.7	92.9	211
Sex				
Male	4.5	8.2	87.2	1081
Female	2.8	7.7	89.5	1075
Age**				
10 years	7.4	12.0	80.6	366
11 years	4.9	8.0	87.1	349
12 years	2.0	7.6	90.4	354
13 years	3.6	7.5	88.8	385
14 years	2.8	6.0	91.8	353
15 years	1.7	6.6	91.7	349
Family type*				
2 natural parents	3.0	7.1	89.9	1261
1 natural parent	4.5	8.3	87.3	604
1 natural and 1 step parent	5.0	12.3	82.8	261
No natural parents	3.3	3.3	93.3	30

*p <.05 **p <.01

VICTIMS AT HOME AND AT SCHOOL

Of the 913 victims at home, 135 (14.8%) were also victims at school. In contrast, of the 1,201 children not victimised at home, 112 (9.3%) were victims at school. Being victimised at home significantly increased the odds of also being victimised in school. A more detailed look at the type of victim at home revealed that only sibling bully-victims had increased odds compared to neutrals of being also victimised at school but not the pure sibling victims or pure sibling bullies.

The finding that bully-victims at home are at the highest risk for involvement in bullying in school found here replicates previously reported findings in Israel and the USA (Wolke & Samara, 2004; Duncan, 1999b).

Overall, 12% of adolescents reported being victims of bullying at school

VICTIMISATION AND BEHAVIOUR PROBLEMS

Involvement in sibling bullying was related to increased Difficulties scores in the SDQ (see Figure 1). Sibling bully-victims had the highest Total Difficulties scores, followed by bullies and victims. Those not involved in sibling bullying had the lowest Total Difficulties scores. Similarly, those bullied at school, in particular, those victimised using both physical and relational means had highly increased Total Difficulties scores in the SDQ. Considering both family and school settings, while those bullied in both settings had the highest score, those bullied in a single setting had more difficulties than those not bullied (Figure 1).

While mean differences indicate a general shift of scores, the SDQ abnormal clinical scores have been used to identify young people who are at increased risk for child psychiatric disorders likely to require treatment (Goodman et al., 2003). The impact of sibling and school bullying on SDQ total scores in the clinical range are shown in Figure 2. Involvement in all types of sibling bullying increased the risk of abnormal SDQ total scores. However, once adjusted for age, sex, family type, parents' highest qualification, family income and type of victimisation experienced in school, being a pure sibling bully or pure sibling victim did not remain a significant predictor of SDQ scores in the clinical range (Figure 2). In contrast, even after adjustment, being a sibling bully-victim increased the odds three times of having behaviour problems.

Being bullied at school was associated with highly increased odds of abnormal SDQ scores, in particular if victimisation was physical *and* relational. The strong association remained after adjustment for social variables and sibling victimisation (Figure 2). The highest risk of behavioural scores in the clinical range was found for children who were bullied both at school by their peers and at home by their siblings and the odds were increased 14 times even when adjusted for other family variables (Figure 3). Odds ratio is a measure of the strength of association. A value of 1.0 shows no association, while positive associations have odds ratios above 1.0 and negative associations are below 1.0.

VICTIMISATION AND HAPPINESS

Adolescents who were bullied by their siblings and in school by their peers were 10-times more often unhappy than those not victimised either at home or in school (Figure 4). Those who were either victimised in just one setting, that is either at home or at school also had double the odds of being unhappy.

The findings here in a representative sample support those previously reported in an Israeli sample (Wolke & Samara, 2004), that those involved in both sibling and school bullying as victims or bully-victims are at the highest risk for behaviour problems. Adolescents bullied in both contexts have more behaviour problems and are much more often unhappy youngsters. Previously trans-context effects from home to peer relationships and well-being have been reported for highly positive sibling relationships (Gass, Jenkins, & Dunn, 2007). We found that if the sibling relationship is conflict laden it negatively affects peer relationships and behaviour adjustment. It appears that for those victimised at home and at school there is little escape from bullying and its consequences. Sibling relationships are a training ground with implications for well-being of

Figure 1 Mean Total Difficulties Scores in the Strength and Difficulties Questionnaire by setting of bullying (N=2,016) (higher scores denote more behavioural difficulties)

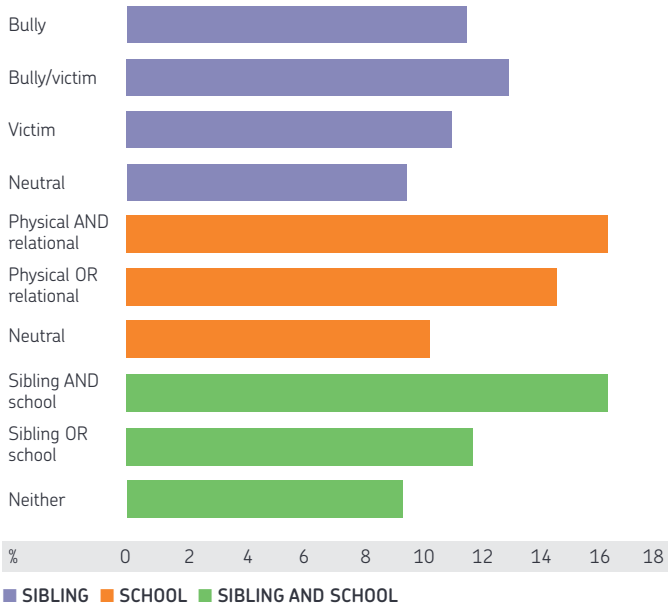
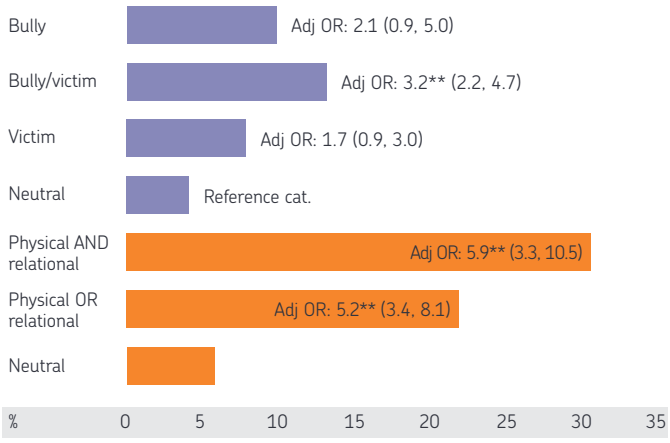
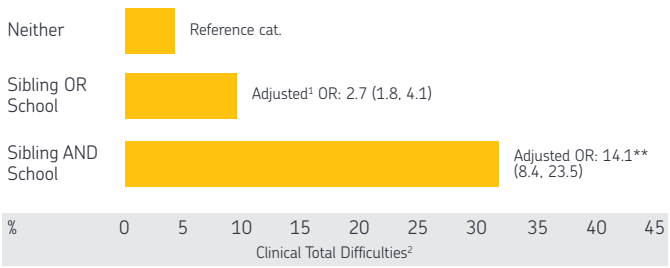


Figure 2 Abnormal Total Difficulties score (>90th percentile) in the Strength and Difficulties Questionnaire by setting of bullying[1] (N=1,955-2,016)



[1] Total Difficulties Scores Abnormal Range computed by excluding two items related to potential bullying or bullying victimisation (see text).
[2] Odds ratios additionally adjusted by type of victim at school.
[3] Odds ratios additionally adjusted by type of bullying involvement at home.

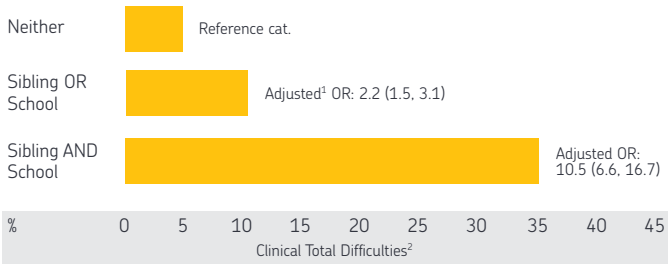
Figure 3 Relationship between bullying by siblings AND/OR at school and clinical SDQ scores



**p<.001

[1] Odds ratios adjusted in logistic regression for age of adolescents (10-12; 13-15 years), sex, family type (2 natural parents; other), highest parental qualification and family income (in quintiles).
[2] Abnormal SDQ scores were determined as scores >90th percentile of all *Understanding Society* adolescents with SDQ data.

Figure 4 Relationship between bullying by siblings AND/OR at school and unhappiness



**p<.001

[1] Odds ratios adjusted in logistic regression for age of adolescents (10-12; 13-15 years), sex, family type (2 natural parents; other), highest parental qualification and family income (in quintiles).
[2] Unhappy was determined as scores <10th percentile of all *Understanding Society* adolescents on the Happiness scale.

the individual. Overall, bullying is one of the major safety concerns for parents as also reported by the recent Staying Safe Survey, commissioned by the then Department of Children, Schools and Families (2009) that interviewed young people aged 12 to 17, and parents/carers. Bullying was the second highest concern expressed about children's safety by parents (61%), and also by children (though only by 35%). The current findings add that bullying also takes place at home and interventions should include the family and parenting skills of dealing with repeated conflicts between siblings (Wolke & Samara, 2004). Strengthening families and parenting skills and increasing sibling support is likely to reduce bullying in school and increase well-being (Bowes, Maughan, Caspi, Moffitt & Arseneault, 2010).

FUTURE RESEARCH

The current analysis documents the strong association of involvement in bullying and reduced well-being and increased likelihood of behaviour problems. However, cross-sectional analysis does not allow for conclusions regarding causality: Are children with behaviour problems more often bullied or does bullying lead to behaviour problems and less well-being? Repeated measures of sibling and school bullying as well as well-being and behaviour problems in future waves (Wave 3, Wave 5) of *Understanding Society* will help disentangle whether bullying uniquely contributes to less well-being. Furthermore, the impact on academic aspirations and economic success needs to be monitored in the long term. Linkage to other data including school examination results and health data would provide objective measures of outcomes that do not rely on self-report. Inclusion of measures of other members of the household and the economic situation of the family will help to investigate what family factors are related to sibling and peer bullying. Finally, the inclusion of biomarkers for the young people as they reach adulthood may help to investigate how social relationships affect physical health, e.g. obesity (Griffiths, Wolke, Page, Horwood & Team, 2006) or how genes may moderate the impact of bullying on mental health outcomes (Sugden et al., 2010).

Sample Size

The *Understanding Society* Youth Questionnaire was completed by 2,163 adolescents aged 10 – 15 years in the four UK countries: in England there were 1,672 young people, 97 in Wales, 176 in Scotland, and 211 in Northern Ireland. Of the 2,163 adolescents, 1,872 (87%) had siblings and after excluding those with missing information 2,114 children, including those with no siblings, could be included in the analysis of combined school and sibling bullying. The distribution of the sample by age was fairly even with approximately 350 adolescents in each age year. The data are weighted to take account of design effects in the sample.

Findings

More than half of all siblings (54%) are involved in bullying as either the bully or the victim or both. At school, 12% of young people reported being involved in bullying

Bully-victims at home are most likely to also be involved in bullying at school. Strengthening parenting skills and increasing sibling support is likely to reduce bullying and increase well-being.

After taking account of individual and family characteristics, there is a strong association between involvement in bullying and reduced well-being. Adolescents who are bullied by their siblings and at school are ten times more likely to be unhappy with their life than those not victimised in either setting.

Being bullied at school is associated with increased behaviour problems. After adjusting for individual and family characteristics, being a sibling bully-victim increased the odds three times of having behaviour problems. The risk of behavioural scores in the clinical range for young people bullied both at home and at school was 14 times as great as those who were not bullied at all.

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MEASURING WORK: PROSPECTS FOR LABOUR MARKET RESEARCH IN *UNDERSTANDING SOCIETY*

Mark L. Bryan

INTRODUCTION

Work is a dominant experience in most people's lives. They spend years preparing for it through education and training, it is typically their main activity and means of support during their prime years, and pension savings from work are the bedrock of a decent retirement. Despite recurrent predictions over the years of a future leisure society, there is little evidence that work is getting any less important: even though there has been a reduction in the average (men's) working week over the last century, it has been completely offset by increased labour force participation by women; and while young people's working hours have fallen, this is largely because they stay in education longer to prepare for their careers (Ramey & Francis, 2009). Meanwhile older people's working lives are likely to lengthen in the coming decades as life expectancy continues to increase and pension provision becomes less adequate. This chapter provides an overview of labour-market research based on household panel data, before outlining the new possibilities opened up by *Understanding Society*, and giving an overview of the main work-related measures in the survey. We conclude with an illustration, taken from the data, of the new opportunities.

Micro-level studies of labour market behaviour have flourished in the last three decades thanks to the increasing availability of large datasets covering individuals and households (Angrist & Krueger, 1999). The demand for such research – examining individual labour market outcomes and how they react to policy or institutional changes – is likely to continue against a policy background that stresses the importance of personal skills and individual decisions about work and careers. Longitudinal data play a key role because they enable researchers to observe directly how individuals' experiences evolve over time as features of their environments change. Household panel data, such as the British Household Panel Survey (BHPS) and now *Understanding Society*, add an extra dimension because individuals can be studied in the context of their household and interactions between household members.

Studies using the BHPS have covered all the main areas of labour market research. Not surprisingly, a major focus has been on investigating the determinants of wages. Some studies have investigated conventional wage determinants, like training (Booth & Bryan, 2005), labour market experience and job tenure (Williams, 2009), industry affiliation (Benito, 2000), and trade unions (Andrews, Stewart, Swaffield & Upward, 1998); while other studies have investigated more unexpected sources of wage variation like marriage (Bardasi & Taylor, 2008), motherhood (Gangl & Ziefle, 2009) and housework (Bryan & Sevilla-Sanz, 2010). Other researchers have investigated earnings inequality (Blundell, Gosling, Ichimura & Meghir, 2007) and individual earnings dynamics (Stewart, 2007), measured intergenerational earnings mobility (Nicoletti & Ermisch, 2008) and looked at social position more broadly (Gershuny, 1999). Issues around disadvantage, for example to do with disability (Berthoud, 2008); gender (Manning & Swaffield, 2008), and recurring unemployment (Arulampalam, Booth & Taylor, 2000), have also received much attention.

The longitudinal structure of the BHPS, following people over time as policy changes, has been used as a test bed to evaluate initiatives such as the National Minimum Wage (Arulampalam, Booth & Bryan, 2004) and in-work benefit reform (Francesconi, Rainer & van der Klaauw, 2009). Longitudinal data are also vital to examine end-of-career transitions out of the labour market and retirement (Banks & Smith, 2010).

Older people's working lives are likely to lengthen in the coming decades

A major advantage of the BHPS, and now *Understanding Society*, over surveys like the Labour Force Survey (Office for National Statistics, 2010b) is the coverage of subjective well-being measures and wider life domains. For example, researchers have investigated job satisfaction (Green & Tsitsianis, 2005) and assessed links between shift work and mental health (Bara & Arber, 2009). It is also often crucial to take account of within-household interactions: educational choices may involve both parents and children (Ermisch & Francesconi, 2000), and housework hours in couples depend on the interaction of both partners and their gender role attitudes (Kan, 2008). Thus, state-of-the-art labour supply models have taken account of both members of a couple (Couprie, 2007). Many other topics involve consideration of the household context, for instance family happiness (Booth & van Ours, 2008) and family migration (Boyle, Feng & Gayle, 2009).

Understanding Society promises to extend the opportunities for research in all of these areas, as well as stimulating innovative work in new areas thanks to the range and detail of the information collected. The next section outlines the key new features of *Understanding Society* that are particularly relevant to work research.

NEW FEATURES OF *UNDERSTANDING SOCIETY* OF RELEVANCE TO WORK RESEARCH

Large sample: *Understanding Society* contains 40,000 households compared to 8,000 in the BHPS. A drawback of surveys with moderate sample sizes is that specific sub-groups of interest, such as older workers or the unemployed, are often too small for detailed analysis. The larger sample size in *Understanding Society* should give researchers a much greater insight into differing labour market experiences across employment subgroups, and allow differentiated analysis within categories like gender, occupation and industry. It will also be possible to do finer analysis by region, exploring the effect of regional economic conditions or policies on employment experiences. Local area research will be facilitated by the release of a wide range of geographical identifiers, allowing information to be matched in at different levels (for example, travel-to-work areas and census-based small areas). Chapter 11 has more detailed information about these research opportunities.

***Understanding Society* will allow a richer view of labour market trajectories than is possible with other surveys**

Ethnic minority boost sample: *Understanding Society* includes a booster sample of nearly 5,000 individuals from the five main ethnic minority groups: Indian, Pakistani, Bangladeshi, Caribbean and Black African (as well as 'other' backgrounds). The ethnic minority boost will provide sufficient numbers of cases to allow the labour market experiences of ethnic minority individuals to be analysed robustly for the first time in a UK panel survey. Respondents in the boost sample receive the same questions as the main sample as well as extra questions focusing on ethnicity issues, for example discrimination in getting jobs, training and promotion (a white comparison sample of 500 households is also asked the extra questions). The ethnic minority boost will allow researchers to explore issues like integration and disadvantage in the labour market, and to see how they evolve over time.

Data linkage: as well as the provision of geo-codes to allow local area characteristics to be matched to the data, there are plans to link in administrative records. The information that will be available potentially includes records of health, benefit receipt, participation in government employment schemes, educational results, savings and pensions, earnings and National Insurance contributions.

Wide topic coverage and rich contextual variables: *Understanding Society* covers a wider range of topics than the BHPS, which opens up opportunities for research linking work behaviour to other life domains and facilitates interdisciplinary work. Examples of new or enlarged topic areas are social networks, risky behaviour, psychological traits, cognitive ability, health (including direct physical 'biomarker' measures), marital relationship quality, well-being and sleep quality. By placing households' work activities within the broader context of their lives as a whole, *Understanding Society* will allow a richer view of labour market trajectories than is possible with other surveys. Later in this chapter we provide a glimpse of the possibilities by taking a first look at how job characteristics are related to sleep duration and quality.

WORK MEASURES IN *UNDERSTANDING SOCIETY*

As with the other key topic areas in *Understanding Society*, the work content consists of a core set of annually repeated questions with more detailed questions included in periodic rotating modules. Table 1 summarises the core work content of *Understanding Society*. The top part of the box lists the annual repeated measures that capture the main characteristics of current work activity as well as a history of changes since the previous interview (from Wave 2 only). The new work history questions are simpler than the BHPS versions (for example some characteristics of jobs between waves, like sector and workplace size, were little used and are omitted) but there is new information on the main attraction of a new job (for example, more money or more flexible hours), and the dates of maternity or paternity leave are collected. The first wave of the survey also lists some questions from the survey's Initial Conditions module. These include highest qualification and age of leaving full-time education (listed in the lower part of Table 1).

The Employment History module is also a major source of work related information. In this module, respondents were asked for the details of their first job and for each additional employment spell since leaving full-time education. These questions were previously asked of respondents in the BHPS. The Employment History module was included in the Wave 1 interview between January and June, 2009, so for about a quarter of the new sample.

More detailed information about employment conditions and work schedules is collected in an Employment Conditions module, planned for every two years (beginning in Wave 2), with a longer module planned for every 4 waves (beginning in Wave 4).

Table 1 Core work measures in *Understanding Society*

Annual repeated work measures
Labour market activity status
Contract type (permanent/seasonal/fixed-term etc)
Industry affiliation (SIC07)
Occupation (SOC2000)
Managerial duties
Workplace size
Sector (private/public)
Standard and overtime hours (paid and unpaid)
Gross and net pay, and pay period
Salaried or hourly paid
Hourly pay rate, and overtime pay and rates
Place of work (home, employer's premises etc)
Second job characteristics (occupation, self-employment, hours, earnings)
Education and training courses, and qualifications obtained
Activity changes, including job and employer changes, and reasons for changes
Membership of workplace pension
Number of employees if self employed
Nature of self-employment (business, work for self etc)
Profit/loss or average business income
Job satisfaction
Job search activity
Characteristics of last job if not working
Travel to work time and mode of transport
Background measures
Highest educational qualification and vocational qualifications
School and full-time education leaving ages
Immigrant status and citizenship
Occupation in first job (quarter sample only)
Employee/self-employed (had employees) in first job (quarter sample only)
Managerial duties in first job (quarter sample only)
Employment status history (quarter sample only)
Parents' employment and occupation when respondent 14 years old
Parents' immigrant status
Parents' educational qualifications

Table 2 summarises the measures in the short module, which considerably expand the coverage of work conditions contained in the BHPS. New measures include more detailed working time indicators, job autonomy and negative well-being at work (anxiety and depression scales). Possible additions in the longer module are measures of work and organisational commitment, job preferences, harassment at work and within-household work time synchronisation. These new measures will open up opportunities for investigating the interactions between the household and labour market in more depth than is possible using datasets focused mainly on the labour market, for example the Workplace Employment Relations Survey (Department for Business, Innovation and Skills, n.d.) and Labour Force Survey (Office for National Statistics, 2010a) or on the household, for example the General Lifestyle Survey (Office for National Statistics, 2010b).

Table 2 Employment conditions module (from Wave 2)

Compensation method (performance pay, bonus, annual increments)
Union coverage and membership
Characteristics of workplace pension
Usual daily work times; weekend working
Availability and use of flexible work
Job autonomy
(Negative) well-being at work
Preferences and expectations job change (e.g. better job, training, stopping work)
Subjective job security
Physical activity in job (physical work module)
Commuting and access to work (commuting behaviour module)

Table 3 lists some other items not included in the work core or special modules, but of relevance to work research. The first three are measures of time devoted to forms of non-market work (volunteering, housework and informal care), while the final item measures work-related discrimination among the ethnic minority boost.

Table 3 Other work-related variables

Time spent volunteering in last 12 months and 4 weeks (from Wave 2)
Hours of housework (from Wave 2)
Hours of informal care provided within and outside household, and to whom
Perceived discrimination (based on sex, age, ethnicity etc) in getting a job, promotion or training (ethnic minority boost and general population comparison only)

DATA ILLUSTRATION: SLEEP DURATION AND QUALITY ACCORDING TO JOB CHARACTERISTICS

This section uses data from the first wave of *Understanding Society* to illustrate how the labour market can be related to the broader context of people's lives. We take a first look at how employees' working hours, level of managerial responsibility and overall job satisfaction are associated with their duration and quality of sleep. Previous research has looked at how sleep duration may be affected by other uses of time, for example time spent at work (Biddle & Hamermesh, 1990), but has especially focused on the adverse health outcomes associated with low sleep quality. As detailed in the more extensive analysis in Chapter 10, poor sleep is both a symptom and a precursor of poor health and is associated with work problems like accidents and absenteeism. International evidence also shows that job stressors strongly predict poor sleep quality (Knudsen, Ducharme & Roman, 2007; Lallukka, Rahkonen, Lahelma & Arber, 2010).

Sleep quality is associated with job satisfaction, reflecting the links between well-being at work and home

Tables 4-6 and Figures 1 and 2 relate selected job conditions to two sleep measures, hours per night and subjective sleep quality. They are taken from questions asked in the *Understanding Society* self-completion questionnaire (for full details of all the sleep items, see Chapter 10). The usual number of hours of sleep per night in the last month is grouped into three bands (less than 6 hours, 6–8 hours and more than 8 hours). Poor sleep quality is indicated by the proportion of respondents who said that their overall sleep quality in the last month was 'fairly bad' or 'very bad'. The tables cover employees of working age (see note to Table 4) from the full UK sample. It was not feasible to split the analysis into the separate UK countries because the cell sizes are too small when disaggregated by job characteristics.[1]

Table 4 and Figure 1 relate the sleep measures to usual hours worked reported as: 30 hours or less (part-time work), 31–48 hours (standard full-time work) and more than 48 hours (long-hours jobs). Because men and women differ widely in their average working time, we also report separate results for men and women. Perhaps unsurprisingly, working part-time is associated with a higher prevalence of long sleep durations: 14% of both men and women working part-time sleep for more than 8 hours per night, declining to about 6% (men) and 10% (women) for those working more than 30 hours per week (there is little difference between standard full-time and long-hours jobs).[2]

By contrast, working long hours rather than standard full-time hours is associated with less sleep. However, the reduction mainly shows up as an increase in short sleep durations (<6 hours) rather than a reduction in long

Figure 1 Sleep quality is fairly or very bad by hours worked

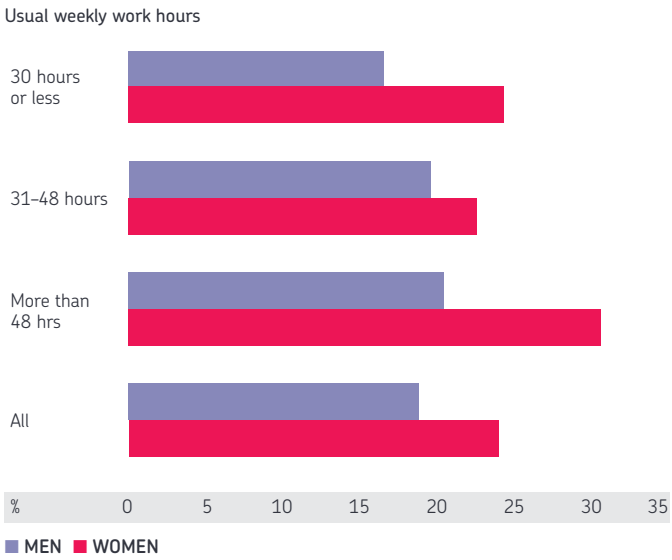


Figure 2 Sleep quality by managerial role

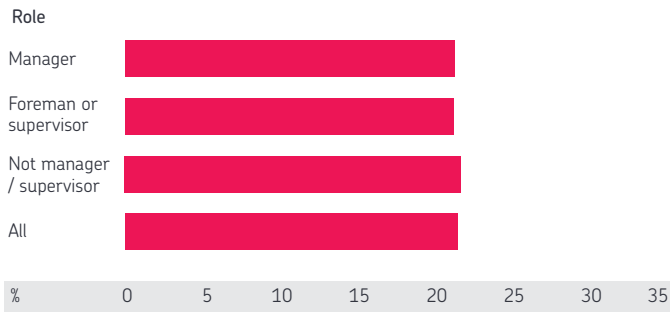
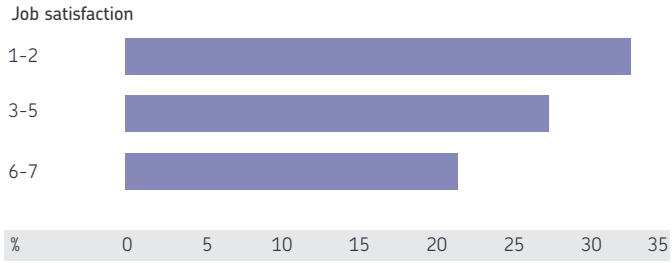


Figure 3 Sleep quality by job satisfaction



[1] Almost 80% of the sample is from England. Numbers of employees giving valid sleep quality responses in the other countries are: Wales, 400; Scotland, 773; Northern Ireland, 744.

[2] Further disaggregation of the data shows that parental status also matters. Only 12% of mothers employed part-time (of children under 16 in the household) get more than 8 hours' sleep per night compared to 16% of women employed part-time without children in the household. There is little difference in the prevalence of long sleep durations between mothers and non-mothers working full time (11% and 10% sleep for more than 8 hours). Sample sizes are too small to make these comparisons for part-time men.

Table 4 Sleep duration by hours worked (working-age employees)

	Usual sleep duration (%)			
Usual weekly work hours	**< 6 hours**	**6–8 hours**	**> 8 hours**	**Obs**
Men				
30 hours or less	8.7	76.9	14.4	333
31–48 hours	8.8	85.1	6.0	2,679
More than 48 hrs	10.8	83.4	5.8	850
All	9.2	84.0	6.7	3,862
Women				
30 hours or less	10.1	76.0	13.9	1,874
31–48 hours	9.0	80.8	10.2	2,407
More than 48 hrs	13.8	77.1	9.1	343
All	9.8	78.6	11.6	4,624

Sample is respondents giving full individual interviews, whose main activity was paid employment, were aged between 16 years and State Pension Age (60 for women, 65 for men), and gave full information on the variables in the table. Estimates are weighted for survey design.

Table 5 Sleep duration by managerial role (working-age employees)

	Usual sleep duration (%)			
Role	**< 6 hours**	**6–8 hours**	**> 8 hours**	**Obs**
Manager	8.5	85.6	5.9	2,215
Foreman or supervisor	10.6	79.4	10.0	1,260
Not manager/ supervisor	9.6	79.6	10.8	4,987
All	9.5	81.2	9.3	8,462

See note to Table 4

Table 6 Sleep duration by job satisfaction (working-age employees)

Job satisfaction: from 1 (completely dissatisfied) to 7 (completely satisfied)	Usual sleep duration (%)			
	< 6 hours	**6–8 hours**	**> 8 hours**	**Obs**
1–2	14.4	78.2	7.4	580
3–5	10.9	79.6	9.5	2,650
6–7	8.3	82.2	9.5	5,296
All	9.5	81.1	9.3	8,526

See note to Table 4

durations (>8 hours), and especially among women: 14% of women working more than 48 hours sleep less than 6 hours per night, compared to 9% of women working 31-48 hours.[3] The fact that there is little effect of long-hours working (compared to standard full-time) on long sleep durations suggests that time constraints are not the main reason for the lack of sleep. Other reasons, like stress, may be more important. (See Figure 1.) Consistent with this, we find a higher prevalence of poor sleep quality among long-hours workers, again especially among women: 31% of long-hours women report poor sleep quality compared to only 23% of those who work 31–48 hours per week. There is little difference in subjective sleep quality between women who work part-time and the standard full-time.

Turning to the association between sleep and managerial duties, Table 5 shows that managers are less likely to sleep for more than 8 hours (by about 4 percentage points) than

[3] This relationship does not seem to be mediated by motherhood. That is, the relationship between work hours and sleep duration is not changed when statistical control for motherhood is introduced. This may be because very few mothers work more than 48 hours per week (less than 5% of those with children in the household in the sample).

either foremen or supervisors, or those with no managerial duties. But there is little difference in the prevalence of short sleep durations, and no difference in subjective sleep quality across managerial duties, as shown in Figure 2.

Finally, Table 6 shows a strong relationship between sleep and job satisfaction (reported by respondents on scale of 1 to 7, but aggregated into three bands owing to small numbers in some of the categories). Those who are most dissatisfied with their jobs are more than 6 percentage points more likely to sleep for less than 6 hours per night than the most satisfied employees, and just over 2 percentage points less likely to sleep for more than 8 hours. These differences are paralleled by a strong gradient in sleep quality: 33% of the most dissatisfied employees report poor sleep quality, declining to 18% of the most satisfied (see Figure 3). These results are clear evidence of the links between well-being at work and at home.

SUMMARY

This illustrative analysis focuses on the association of job characteristics and work satisfaction on sleep duration and perceived sleep quality. Working long hours is associated with less sleep and poorer sleep quality, especially for women. Having managerial duties is not related to perceived sleep quality or having short hours of sleep. Job satisfaction is strongly associated with sleep quality and to sleeping fewer than 6 hours per night. Future analyses can begin to disentangle the effects of other factors related to both sleep and employment such as the effects of health and personal relationships at home.

CONCLUSIONS

Understanding Society is the only UK data source to track individuals' skills development and work experiences year by year in the context of their households. Against the background of a rich body of micro-level research into employment and labour markets, this chapter has outlined what *Understanding Society* has to offer researchers in the future. Compared to its predecessor, *Understanding Society's* much larger sample (and in particular the ethnic minority boost) opens up the prospect of much finer analysis of the labour market trajectories of ethnic minorities and other subgroups, and of region-specific trends. The rich data available in a variety of other domains will allow researchers to study in much more depth how individuals' work experiences are embedded in other aspects of their lives and that of their households.

Sample Size

The sample is respondents giving full individual interviews, including the self-completion questionnaire, whose main activity was paid employment, were aged between 16 years and State Pension Age (60 for women, 65 for men), and gave full information on the variables in the table. Those in full-time education are excluded. The sample size is also restricted to permit the analysis of sleep variables which are in the adult self-completion questionnaire. Estimates are weighted for survey design.

Findings

Understanding Society will be a rich resource for labour market research. Its longitudinal data will permit examination of how individuals' work lives evolve over time as aspects of their environments change. Labour market behaviour can also be examined in relation to the household context. Annual or core work measures include attributes of the occupation and workplace, earnings, participation in pension schemes, job satisfaction, and commuting behaviour. In Wave 2, an employment conditions module will provide more detailed views of features of work.

Use of the work data is illustrated by assessing the association of work related characteristics and sleep duration and perceived quality, which are also examined in Chapter 10. This application shows the utility of *Understanding Society* for examining the links between well-being at home and work. Sleep duration is categorised as less than 6 hours, 6-8 hours, and more than 8 hours. Poor sleep quality was expressed by persons saying their sleep in the last month was fairly bad or very bad.

Long work hours (more than 48 hours per week) are associated with an increase in short sleep durations, particularly for women workers. In addition 30% of women who work more than 48 hours per week say their sleep is poor, compared to 23% of those working 31-48 hours. Sleep quality has little association with hours worked for men.

There is a strong association between these sleep outcomes and job satisfaction: 18% of the most satisfied report poor sleep with 33% of those who are least satisfied. In addition the least satisfied are more likely to have shorter sleep duration (14%) than those who are most satisfied (8%).

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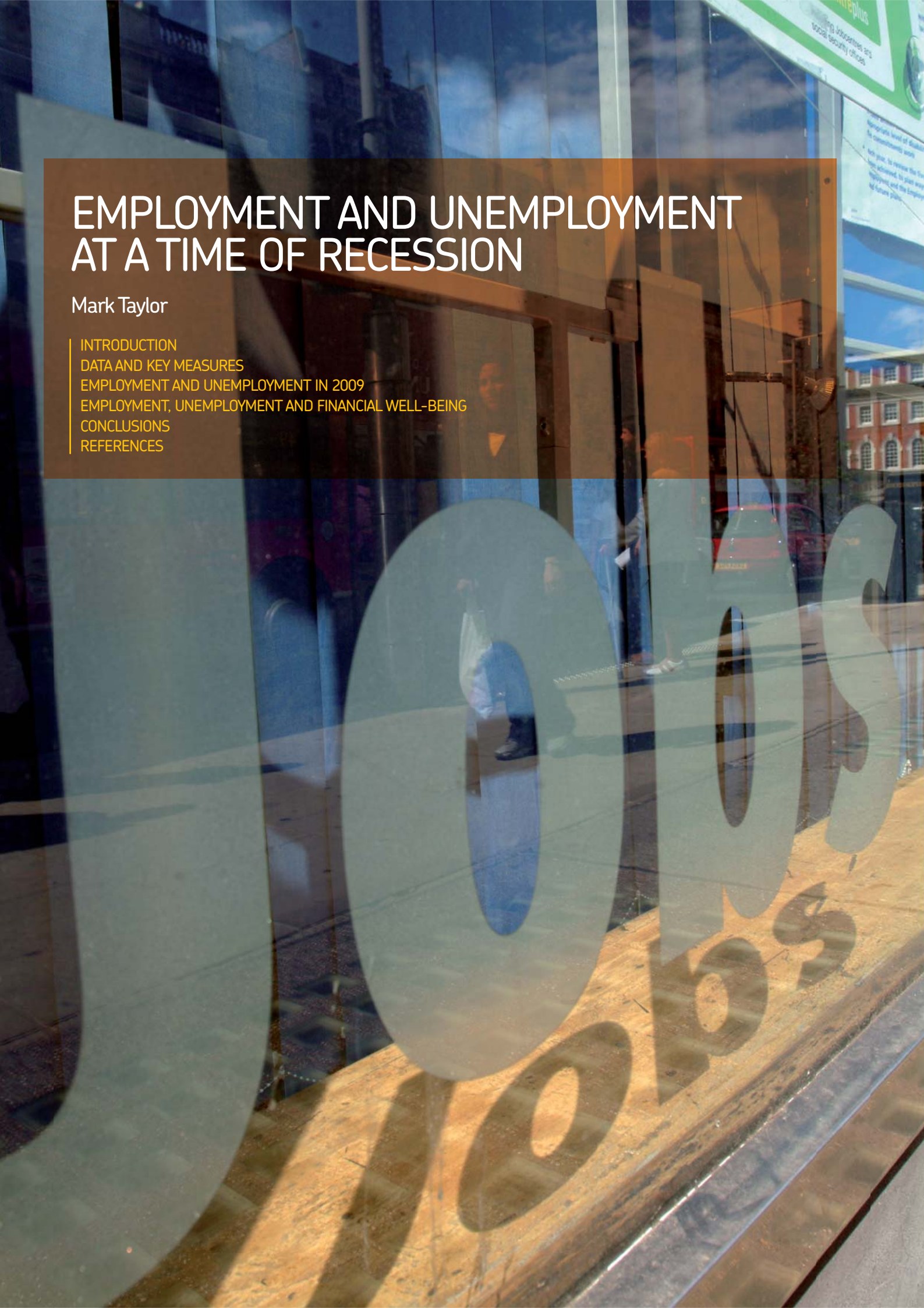
EMPLOYMENT AND UNEMPLOYMENT AT A TIME OF RECESSION

Mark Taylor



INTRODUCTION

The British economy is currently emerging from its first recession in almost twenty years, during which GDP fell by more than in each of the two previous recessions of the early 1980s and early 1990s. Despite the large fall in GDP, the unemployment rate has remained lower than at the same stage in the previous two recessions, so far reaching a peak of less than 9% compared with 10% at the same stage in the previous recessions. A notable feature of this recession is that particular groups within the population have been affected more than others – for example men and young people have been affected more than women and older people (Department for Work and Pensions, 2009; Gregg & Wadsworth, 2010; Office for National Statistics, 2009).

In this chapter we use data from the first wave of *Understanding Society*, collected during the peak of the recession throughout 2009, to investigate factors associated with people's employment status and the impact of employment status on people's well-being. We first summarise people's employment status by a range of individual and household characteristics. We then identify the relationships between a person's employment status and their financial and mental well-being.

DATA AND KEY MEASURES

We initially use *Understanding Society* data to describe the distribution across labour market states by individual characteristics in 2009. Our focus is on men and women of working age (16–59/64) who were not in full-time education at the time of interview, yielding a sample size of 15,098 individuals across the UK, including Northern Ireland (see Appendix for a description of the *Understanding Society* sample design). Where appropriate in the analysis, results are also reported by country of residence.

Survey participants were asked what best describes their current situation and responded using categories including Employee, Self-employed, Unemployed, Retired, Looking after the home and family, Full-time education, and Long-term sick or disabled. For those who were not currently employed, questions on job search and availability for work were asked in order to produce the International Labour Organisation (ILO) definition of unemployment where having looked for work in the past four weeks and being available to start work within two weeks are required. Those who are not in paid employment and not seeking work are defined as being economically inactive.

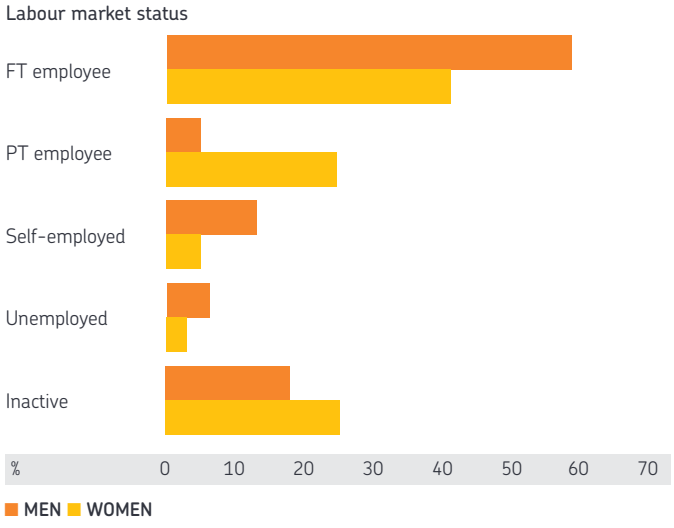
The financial well-being measures include an assessment of current financial situation as well as an assessment of their likely financial situation in one year's time. Life satisfaction scores are also used to assess mental well-being. Participants were asked to rate their overall life satisfaction on a 1 to 7 scale where 1 = 'completely dissatisfied' and 7 = 'completely satisfied'. *Understanding Society* collects several variables capturing people's mental well-being, including life satisfaction, General Health Questionnaire (GHQ-12) scores and whether or not the person currently suffers from depression. These three measures have been shown to be highly correlated (e.g. Taylor et al, 2009). This chapter focuses on life satisfaction.

EMPLOYMENT AND UNEMPLOYMENT IN 2009

EMPLOYMENT STATUS AND GENDER

Looking first at the distribution of employment status by gender, Figure 1 shows that 58% of men and 41% of women were in full-time employment in 2009 (defined as working thirty or more hours per week in their main job), with a further 5% and 25% respectively in part-time work (working less than thirty hours per week in their main job).

Figure 1 Employment status of men and women of working age



Overall, 63% of men and 66% of women were employees, and a further 13% of men and 6% of women were self-employed. Although employment rates among men and women of working age were similar (at 70%), a larger proportion of men than women were in full-time work and self-employment, while a larger proportion of women

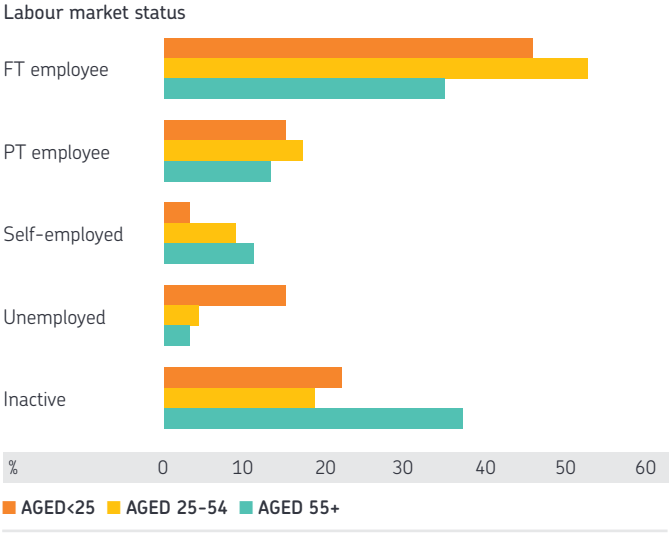
than men were in part-time work. Despite the survey data being collected at the peak of the recession, average unemployment rates in the sample using the International Labour Organisation definition of unemployment (Hussmanns, 2007) were relatively low – 7% of men and 3% of women were unemployed. A substantially larger proportion of women (25%) than men (17%) were economically inactive (not in work and not searching for a job). Among women, 52% of the economically inactive were looking after their family or home, while 18% reported they were long-term sick or disabled. A further 16% of women referred to themselves as 'unemployed' but had not looked for a job in the last four weeks. Among men, 35% of the economically inactive reported they were long-term sick or disabled, 29% were retired, and a further 23% referred to themselves as 'unemployed' despite not looking for a job in the last four weeks.

EMPLOYMENT STATUS BY AGE GROUP

These averages for men and women mask considerable differences in working status across population subgroups. The proportions of individuals in each labour market state vary a little by country of residence but more significantly by other individual level characteristics. For example, rates of full-time employment are highest in England and Scotland (at 50%) and lowest in Wales and Northern Ireland (45%), part-time employment is highest in Wales (18%) and lowest in England and Northern Ireland (16%), while economic inactivity is highest in Wales and Northern Ireland (25%) and lowest in England and Scotland (20%).

When looking at employment status by age group, Figure 2 indicates that full-time employment rates were highest (at 53%) among 'prime-aged' workers (aged 25–54) and lowest (at 35%) among those approaching state pension age (55 and over). In contrast, unemployment rates were highest (at 15%) among workers aged less than 25, and lowest among older workers (3%).

Figure 2 Employment status by age



Unemployment rates were highest among workers aged less than 25

Self-employment rates increased with age, while older people were more likely than younger workers to be economically inactive (37% compared with 18–21%). These data indicate that almost 40% of people aged less than 25 not in full-time education were also not working. The number of young people not in education, training or employment is a key policy concern and given the strong persistence found in unemployment and economic inactivity over time (Arulampalam, Booth & Taylor, 2000), suggests that a large proportion of young people may struggle to find long-lasting stable employment in the future.

EMPLOYMENT STATUS AND FAMILY STATUS

Figure 3 illustrates how labour market status varies across family status types. This shows that more than one half of people with no children (either partnered or single) were in full-time work, while about 10% were in part-time work. In contrast, 46% of couples with children and only 28% of lone parents were in full-time work, while 21% of people with children were in part-time employment. The majority of the former are men, and of the latter are women. Unemployment and economic inactivity rates are higher for single people than partnered people, and this partly reflects the fact that single people are on average younger. A large proportion of lone parents – most of whom are women – were economically inactive (37%).

Figure 3 Labour market status by family status

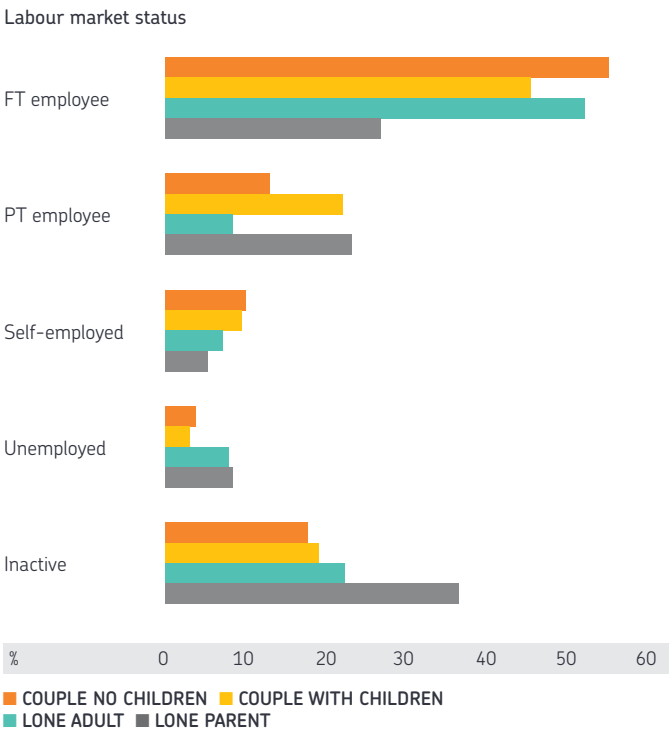


Table 1 Current labour market status by ethnicity

	Employee	Self-employed	Unemployed	Inactive	*N*
White	65.8	9.0	4.7	20.5	13,647
Mixed	61.5	[5.8]	[9.6]	[23.1]	156
Indian	67.1	[9.0]	[5.2]	18.7	289
Pakistani/Bangladeshi	38.4	[10.0]	[7.8]	43.9	271
Chinese/Asian	68.2	[8.8]	[2.8]	[20.3]	182
Black Caribbean	64.0	[5.5]	[9.4]	[21.1]	128
Black African	54.7	[7.9]	[5.9]	31.5	203
Other	55.2	[9.1]	[6.2]	29.5	210
N	9,812	1,351	727	3,196	15,086

Notes: Row percentages. Men and women of working age not in full-time education. [..] indicates percentages based on cell sizes of < 50 observations.

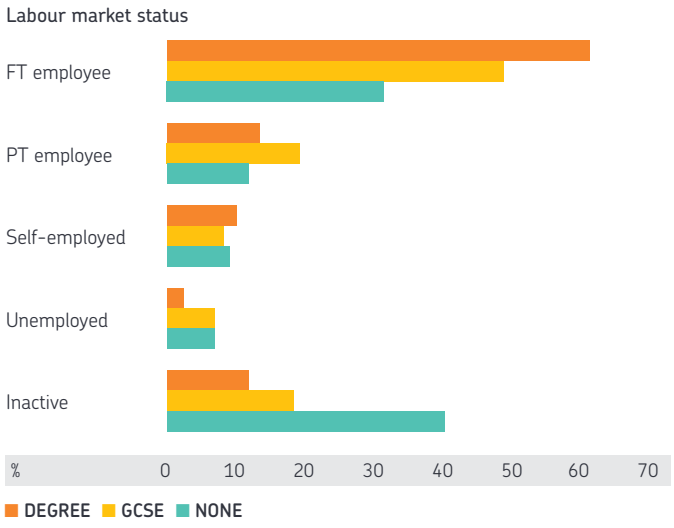
EMPLOYMENT STATUS AND EDUCATION

Figure 4 shows that the full-time employment rate increases with education level. Over 60% of people educated to degree level were in full-time employment, while fewer than 3% were unemployed and 12% economically inactive. In contrast, only 32% of those with no qualifications were in full-time employment, while 6% were unemployed and 40% were economically inactive. This means that almost one half of people with no qualifications are not in work, compared with 15% of those with a degree. Some of this reflects cohort and age effects, as those with no qualifications tend to be older and more likely to have withdrawn from the labour market. Multivariate analysis will reveal the extent to which these differences in employment status by education remain once controlling for age and other confounding and mediating factors.

EMPLOYMENT STATUS AND ETHNICITY

In Table 1 we summarise current labour market status by ethnicity, although this needs to be interpreted with extreme caution because of small sample sizes for some groups. The brackets indicate sample sizes of less than 50 cases. The table indicates that employment rates were highest (exceeding 70%) among those of White, Indian, Chinese, and Black Caribbean background and lowest (less than 50%) among those of Pakistani or Bangladeshi backgrounds. The latter groups also had the highest rates of economic inactivity (exceeding 40%). Differences in unemployment rates are difficult to identify accurately due to small sample sizes. Some of these differences between ethnic groups are due to differences in age and education structures, and our multivariate analysis will identify the extent to which such differences remain once these are taken into account.

Figure 4 Labour market status by education



Over 60% of people educated to degree level were in full-time employment

EMPLOYMENT STATUS AND INDUSTRY

In Table 2 we summarise people's current (if working) or previous (if not working) industry of employment by their labour market status. This helps identify which industries have been most affected by the recession, at least in terms of employment. This indicates that people currently unemployed were disproportionately more likely to have been employed in the construction, wholesale/retail and hospitality industries, and less likely to have been employed in public administration and education or health, which are dominated by the public sector. For example, 14.7% of the currently unemployed were last working in wholesale or retail and 7.7% were working in hospitality. These industries account for 12.3% and 4% of those currently working. In contrast, 26.6% of the employed previously worked in education or health, while less than 10% of the currently unemployed were previously employed in these industries. The recent recession has disproportionately affected employment in the private sector and in wholesale/retail, construction and hospitality in particular.

ACCOUNTING FOR DIFFERENCES IN CHARACTERISTICS

The descriptive results indicate substantial differences across population sub-groups in being employed, unemployed or economically inactive. However, some of these differences might be explained by differences in other observed characteristics between sub-groups. For example, older cohorts tend to be less educated, single people tend to be younger, and people of different ethnic origin have different migration and assimilation histories. To account for this, we have estimated gender-specific multivariate models that take into account differences in observed characteristics, and used the resulting estimates to predict the probability of population sub-groups with otherwise identical characteristics to be employed full-time, unemployed and economically inactive. This helps to identify the extent to which the differences highlighted previously are 'real', and the extent to which they are explained by other observed factors. These models control for respondents' age, education, family status, country of residence, migrant status, parents' employment status when they were aged 14, housing tenure, ethnicity and English language proficiency. The results of the analysis are reported in terms of the predicted probability of being employed, unemployed or economically inactive, holding the other variables constant.

Figure 5 illustrates the predicted probability of men occupying particular labour market states by age and educational attainment, holding other observed characteristics constant. Differences in labour market status by educational attainment and age remain, even when allowing for other observed characteristics.

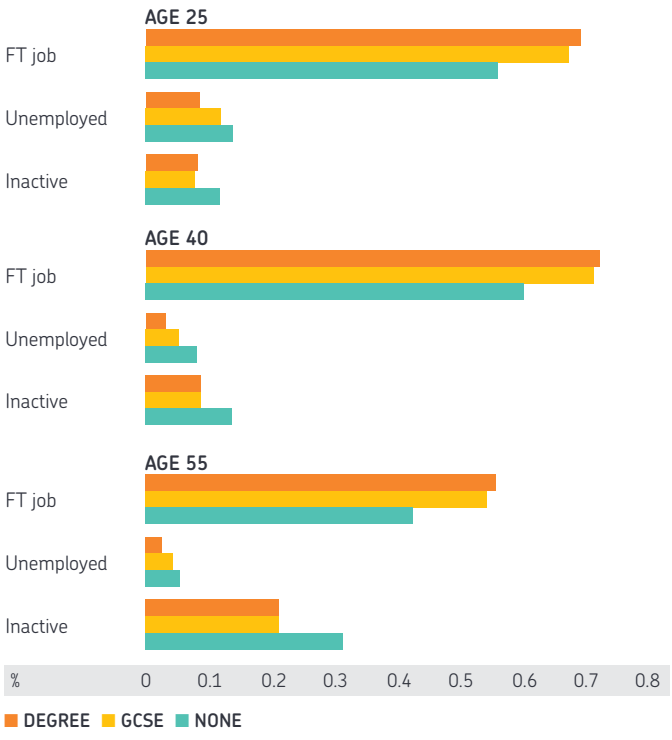
Two thirds of men aged 25 with a degree are predicted to be in full-time jobs, compared to 56% of otherwise similar men with no qualifications. Such differences persist across age groups such that at age 55, 56% of men with a degree are predicted to be in full-time work compared with 42% with no qualifications. Similar patterns also emerge for women (not shown).

Table 2 Current/previous industry of employment by current labour market status

	Working	Unemployed	Inactive	*N*
Industry				
Education/health	26.6	9.3	14.7	3,511
Finance/legal/ professional	15.0	14.4	10.6	2,118
Wholesale/retail	12.3	14.7	12.5	1,878
Manufacturing	9.9	11.5	13.6	1,619
Public admin.	7.7	2.3	4.4	1,023
Construction	6.1	11.4	5.1	932
Transport	4.7	4.3	4.8	711
Hospitality	4.0	7.7	6.5	713
Other	10.9	6.4	7.9	1,511
Missing	2.8	9.5	10.7	725
Never worked	-	8.5	9.2	357
N	11,172	728	3,198	15,098

Notes: column percentages. Men and women of working age not in full-time education.

Figure 5 Predicted probabilities of occupying states by age and educational attainment: Men



In contrast, larger proportions of men with no qualifications than those with high educational attainment are predicted to be unemployed, and these differences are most pronounced at younger ages. For example at age 25, 15% of men with no qualifications are predicted to be unemployed compared to 8% of similarly aged men with a degree. At age 55, these fall to 5% and 3% respectively. Similar differences emerge across educational groups in the probability of economic inactivity at each age. Non-employed young men are equally likely to be in either unemployment or economic inactivity, but as men age they are increasingly likely to be economically inactive and less likely to be unemployed. The extent to which educational attainment causes differences in labour market status, or whether it captures other unobserved factors that are correlated both with educational attainment and labour market outcomes (such as motivation or the propensity to work hard) can only be answered with panel data with repeated observations on the same individuals.

Figure 6 plots predicted probabilities for men by family status, and indicates that, at each age, partnered childless men have the highest predicted probability of being full-time employees and the lowest probability of economic inactivity, holding other characteristics constant. In contrast, at each age, male lone parents have the lowest predicted probability of full-time employment and the highest probability of economic inactivity. In fact, the figure shows that partnered men are always more likely to be employed full-time and less likely to be economically inactive than single men, while childless men are always more likely to be employed full-time and less likely to be inactive than men with children. For women (not shown), we find it is the presence of children, rather than partnership status, that is most associated with labour market status.

At age 25, 15% of men with no qualifications are predicted to be unemployed

Table 3 summarises the predicted probabilities of being in full-time work and of economic inactivity by ethnicity. (We do not present probabilities of unemployment because of small sample size considerations.) This reveals considerable differences even when allowing for different age and education distributions in each minority ethnic group, and differences in English language proficiency.

Figure 6 Predicted probabilities of occupying states by age and family status: Men

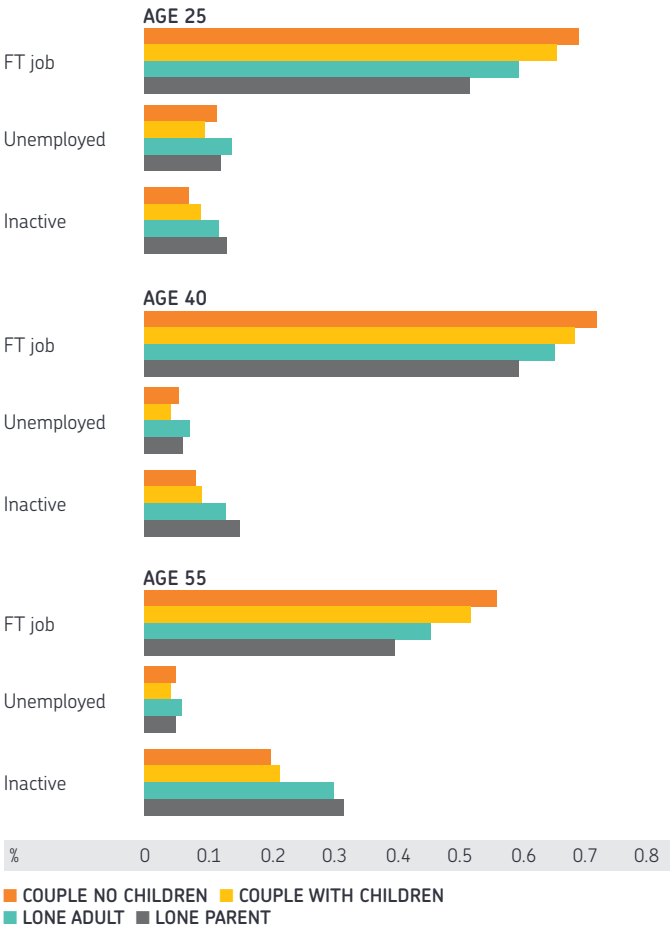


Table 3 Predicted probabilities of occupying a labour market status by ethnic group

	Full-time job			Economic inactivity		
Ethnicity	Age 25	Age 40	Age 55	Age 25	Age 40	Age 55
Men						
White	0.65	0.69	0.52	0.09	0.09	0.23
Indian	0.59	0.65	0.46	0.13	0.14	0.31
Pakistani / Bangladeshi	0.43	0.50	0.33	0.14	0.16	0.34
Caribbean	0.63	0.72	0.54	0.09	0.11	0.26
African	0.48	0.53	0.34	0.17	0.19	0.38
Women						
White	0.45	0.45	0.32	0.23	0.21	0.31
Indian	0.42	0.43	0.31	0.22	0.21	0.30
Pakistani / Bangladeshi	0.28	0.31	0.19	0.48	0.48	0.61
Caribbean	0.61	0.61	0.47	0.14	0.13	0.21
African	0.47	0.47	0.33	0.26	0.24	0.34

Notes: Predicted probabilities estimated from multinomial logit models where dependent variable = 1 if in full-time work; = 2 if in part-time work; = 3 if self-employed; = 4 if unemployed; and = 5 if inactive. Covariates include age, age squared, migrant status and time since migration, country of residence, highest qualification, family status, ethnicity, English language proficiency and parental employment status when respondent aged 14.

Among men, at each age those of white or Caribbean background have the highest predicted probabilities of full-time employment (ranging from 52% at age 55 to 72% at age 40), and the lowest predicted probabilities of economic inactivity (9–23%). In contrast, those of Pakistani or Bangladeshi origin are predicted to have the lowest probability of full-time employment (between 33% and 50%). Men of Black African origin have the highest predicted probability of economic inactivity (17–38%), followed by those of Pakistani or Bangladeshi origin.

The picture is a little different among women. Women of Black Caribbean origin have the highest predicted probabilities of full-time employment at each age (47–61%) followed by those of Black African and White origin. In contrast, women of Pakistani or Bangladeshi background have very low predicted probabilities of full-time employment (19–31%), and relatively high predicted probabilities of economic inactivity (48–61%). Women of Black Caribbean background have the lowest predicted inactivity rates (13–21%).

Beyond the factors affecting the probability of people occupying each labour market state, we are also interested in the impact that labour market status during the recession had on other important outcomes, in particular individuals' perception of financial and mental well-being.

EMPLOYMENT, UNEMPLOYMENT AND FINANCIAL WELL-BEING

CURRENT FINANCIAL WELL-BEING

As part of the *Understanding Society* questionnaire, respondents are asked: 'How well are you managing financially now? Are you: Living comfortably, Doing alright, Just about getting by, Finding it quite difficult or Finding it very difficult?'. In Figure 7 we summarise responses to this question by current employment status and find that employment status is a major determinant of how people coped financially with the recession. A significantly larger proportion of full-time workers reported they were living comfortably or doing alright than people in unemployment or inactivity (67% compared with 23% and 41%). In contrast over 40% of the unemployed reported finding it quite or very difficult, compared with 25% of the economically inactive and less than 15% of those in work. Small differences by country of residence also emerge. For example, 51% of people living in Wales were living comfortably, compared with about 58% in the other three nations, while 34% were just about getting by (compared with about 27% in the other countries). About 15% were finding it quite or very difficult in all four countries.

However, such descriptive statistics may over-estimate the association between employment status and financial well-being, as they do not allow for the fact that, for example, the unemployed tend to be younger, less likely to be partnered, and have lower educational attainment than those in full-time work. To account for this, we have estimated multivariate models to allow for differences in other observable characteristics and obtain adjusted probabilities of occupying each financial status group. In these models we include a range of factors related to people's financial well-being such as their age, labour market status, ethnicity, education, housing tenure, country of residence and family status.

In Figure 8, we plot the characteristics of people who were most and least likely to be finding it quite or very difficult financially, once differences in other observed characteristics are taken into account. Even when adjusting for differences in other observed factors, being unemployed is still associated with the highest probability of finding it difficult financially. All else equal, being unemployed is associated with a 37% probability of finding it difficult.

Figure 7 Current financial situation by employment status

Almost two-thirds of the unemployed expect their financial situation to improve in the next year

Being a social tenant, a lone parent, a single person or having no qualifications are other factors associated with a relatively high probability of having financial difficulties (Figure 8). In contrast, people who owned their home outright have the lowest probability of financial hardship (9%), followed by people educated to degree level (10%) who were married without children or in full-time work (11%). Being a home-owner with a mortgage is also associated with a relatively low probability of financial difficulty.

FINANCIAL EXPECTATIONS IN THE FUTURE

In Figure 9 we examine people's financial expectations for the forthcoming year by their current employment status. The unemployed were most optimistic while the economically inactive were the most pessimistic. Almost two-thirds of the unemployed were expecting their financial situation to improve in the next year, compared with 30% of those in work and 25% of the economically inactive. Although the unemployed struggle financially, they are generally optimistic about their future finances. About 15% of the economically inactive expected their situation to worsen, compared with 13% of those in work and 11% of the unemployed.

Differences by country of residence also emerged, with only 23% of people in Northern Ireland expecting to be better off compared with 31% of those in the other three nations. However those in Northern Ireland were also least likely to expect to be worse off at 11%, compared with 12% in Scotland, 14% in England and 15% in Wales. Those in Northern Ireland were also most likely to expect their financial situation to remain about the same (65% compared with about 55% in the other nations).

In Figure 10 we plot the population sub-groups who have the highest and lowest probabilities of expecting their financial situation to worsen when adjusting for other observed characteristics (including migrant status, country of residence, health, English language proficiency, age, education, employment status and housing tenure). This shows that among the 20% of people already finding it very difficult, they have the highest probability of expecting their situation to worsen, followed by those approaching state pension age and home owners (16%), and people living in Wales or who have no qualifications (14%).

Figure 8 Social groups most and least likely to be finding it quite or very difficult

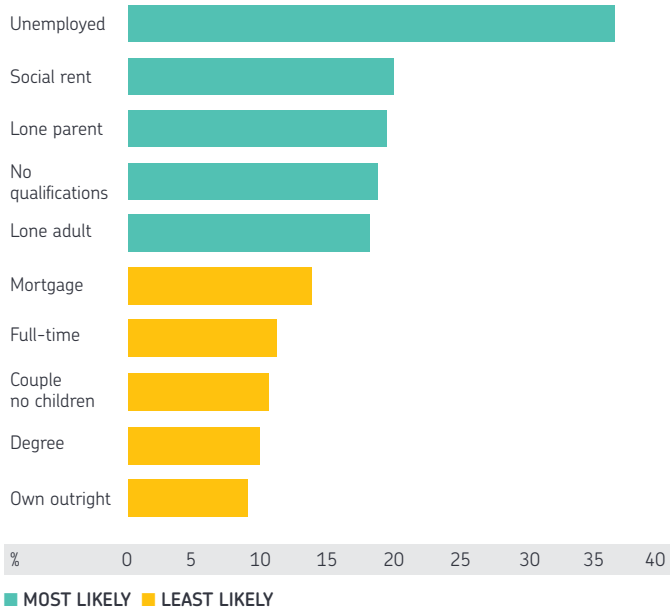


Figure 9 Financial expectations for forthcoming year by employment status

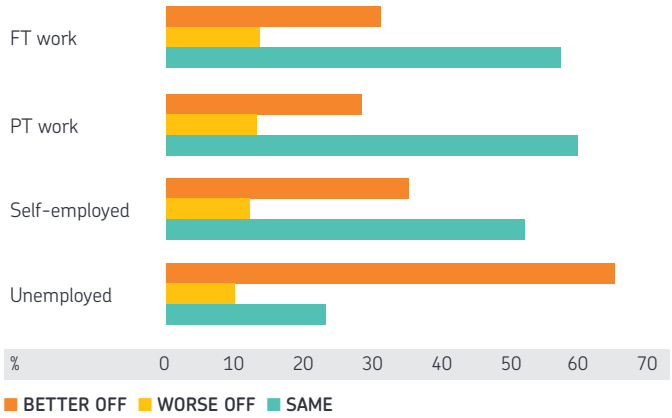
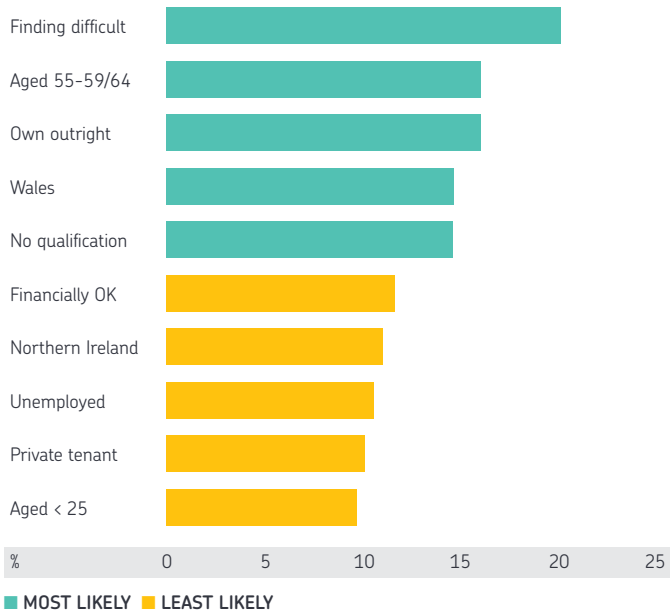


Figure 10 Social groups most and least likely to expect their financial situation to worsen



In contrast, young people, the unemployed, private tenants, those living in Northern Ireland and those who are living comfortably or doing alright have the lowest probability of expecting their financial situation to worsen (at less than 12%). Hence we find a strong association between labour market status and financial well-being. Even when adjusting for other observed characteristics, being unemployed is a major factor in determining whether or not a person finds their current financial situation quite or very difficult. Being in full-time work reduces this probability. Despite this, the unemployed tend to be optimistic about their future finances – more so than those in work – and this persists when adjusting for other characteristics.

EMPLOYMENT, UNEMPLOYMENT AND MENTAL WELL-BEING

There is a wide literature indicating that unemployment reduces mental well-being (for example Clark & Oswald, 1994), and evidence from *Understanding Society* is consistent with this. Figure 11 illustrates that on average the unemployed in *Understanding Society* reported a life satisfaction score of 4.7 on a seven-point scale (where 1=completely dissatisfied and 7=completely satisfied). This compares with an average of 4.8 for the economically inactive and 5.3 for those in some form of employment, so the unemployed and the economically inactive report being less satisfied with their life than those in employment. Only very small differences in average life satisfaction by country of residence emerged.

Figure 12 illustrates the population subgroups with the highest and lowest predicted life satisfaction scores when accounting for differences in other observable characteristics using multivariate analysis. These models include age, labour market status, migrant status, country of residence, educational attainment, marital status, English language proficiency, housing tenure, current financial well-being, financial expectations, and health. Holding other factors constant, people who report living comfortably or doing alright financially have the highest predicted life satisfaction (at 5.4), followed by people aged under 25 and those approaching state pension age (5.3). People who report being in good health are also predicted to have relatively high life satisfaction. In contrast, reporting finding it quite or very difficult financially or being in poor health is associated with low predicted life satisfaction (at about 4.5). Not being in a partnership, either with or without children, is another factor that is associated with low life satisfaction.

This analysis suggests that financial well-being and physical health are factors associated with mental well-being. However there are likely to be unobservable characteristics, such as a person's personality, which are associated with reported mental, physical and financial well-being, and panel data are required to account for these in analysis.

Figure 11 Life satisfaction by current employment status

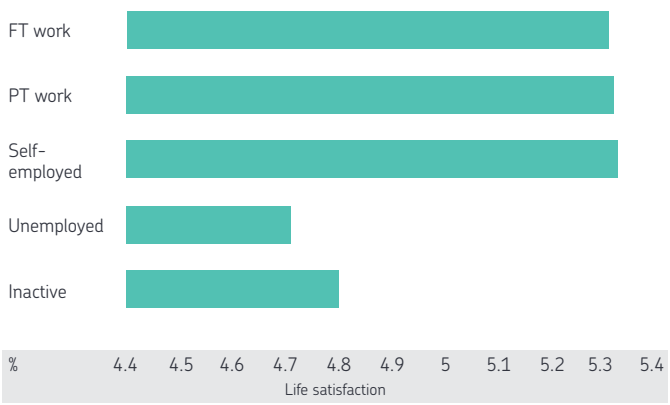
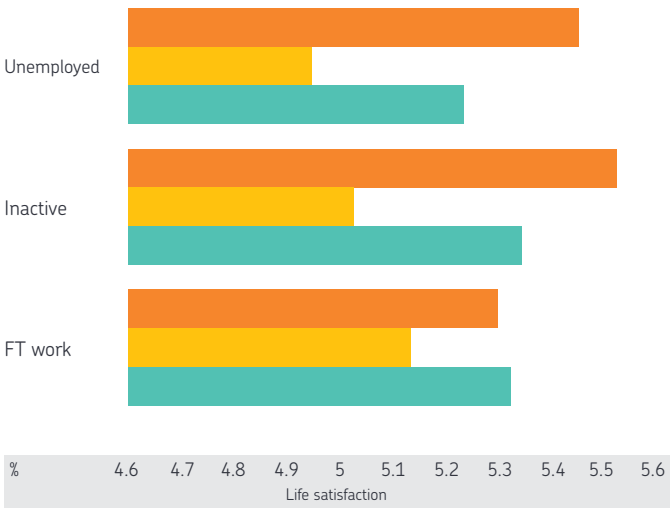


Figure 12 Social groups with the highest and lowest predicted life satisfaction

Figure 13 examines the relationship between age, employment status and life satisfaction in more detail. This reveals some interesting patterns. As we have seen, full-time employment is associated with significantly higher life satisfaction (Figure 11), however this relationship is not so clear when adjusting for age and other observed characteristics. Among young people (aged less than 25), economic inactivity is associated with the highest life satisfaction (a predicted life satisfaction of 5.5), followed by unemployment (5.4) and full-time work (5.3). Being unemployed has no impact on mental well-being among young people, all else being equal. In contrast, unemployment is associated with lower life satisfaction among both 'prime-aged' people and those approaching state pension age, relative to those in the same age group in full-time work (4.9 and 5.2 compared with 5.1 and 5.3 respectively). Unemployment has a much larger impact on the well-being of prime-age and older workers than on that of young people.

Figure 13 Adjusted life satisfaction by age and employment status



CONCLUSIONS

This chapter has used *Understanding Society* data for 2009 to take a first look at employment and unemployment during the recession, and their impacts on financial and mental well-being. This has revealed strong relationships between labour market status and age, education, family status and ethnicity that persist when adjusting for other observed factors. Strong associations between labour market status and current financial well-being and financial optimism also emerge, with unemployment associated with lower current financial well-being but also with expecting the financial situation to improve. Unemployment is associated with worse mental well-being, although not for those aged less than 25. This suggests that the recession, in increasing unemployment among particular population subgroups, will introduce or exaggerate inequalities in financial and mental well-being across the population.

As more waves of *Understanding Society* data become available, we will be able to examine these relationships in much more detail. The large sample sizes will allow us to examine what factors explain employment inequalities between population subgroups, and also the relationships between employment status and financial and mental well-being among population subgroups in more detail. Panel data also allow us to control for differences in unobserved characteristics between people within population subgroups, which panel surveys with smaller sample sizes do not permit.

Sample Size

The sample used in the analysis is based on working age men and women in the UK, including England, Scotland, Wales and Northern Ireland. Working age is defined for men as ages 16 to 64 years and for women as ages 16 to 59 years. Those in current full-time education are not included. From a total of 15,098 individuals of working age, 6,912 were men and 8,186 were women. There were 11,789 individuals resident in England, 1,223 in Scotland, 721 in Wales and 1,365 in Northern Ireland.

Findings

The analysis confirms the recent recession has disproportionately affected particular groups in the population. Those who have fared worst through the recession are the young aged under 25 years, those with lower education levels, single rather than partnered people, lone parents, and those working in the construction, wholesale and retail and hospitality industries.

The unemployed, social tenants, those with no qualifications, single persons, and lone parents are most likely to report finding it difficult to manage financially. Despite this, the unemployed are optimistic and expect their financial situation to improve over the coming year.

The unemployed are more likely to have lower levels of mental well-being as measured by overall life satisfaction even though this is not the case for the younger unemployed aged under 25 years. Unemployment has a much larger negative impact on the well-being of prime age and older workers approaching pension age.

The recession, in increasing unemployment among particular subgroups, will introduce or exaggerate inequalities in financial and mental well-being

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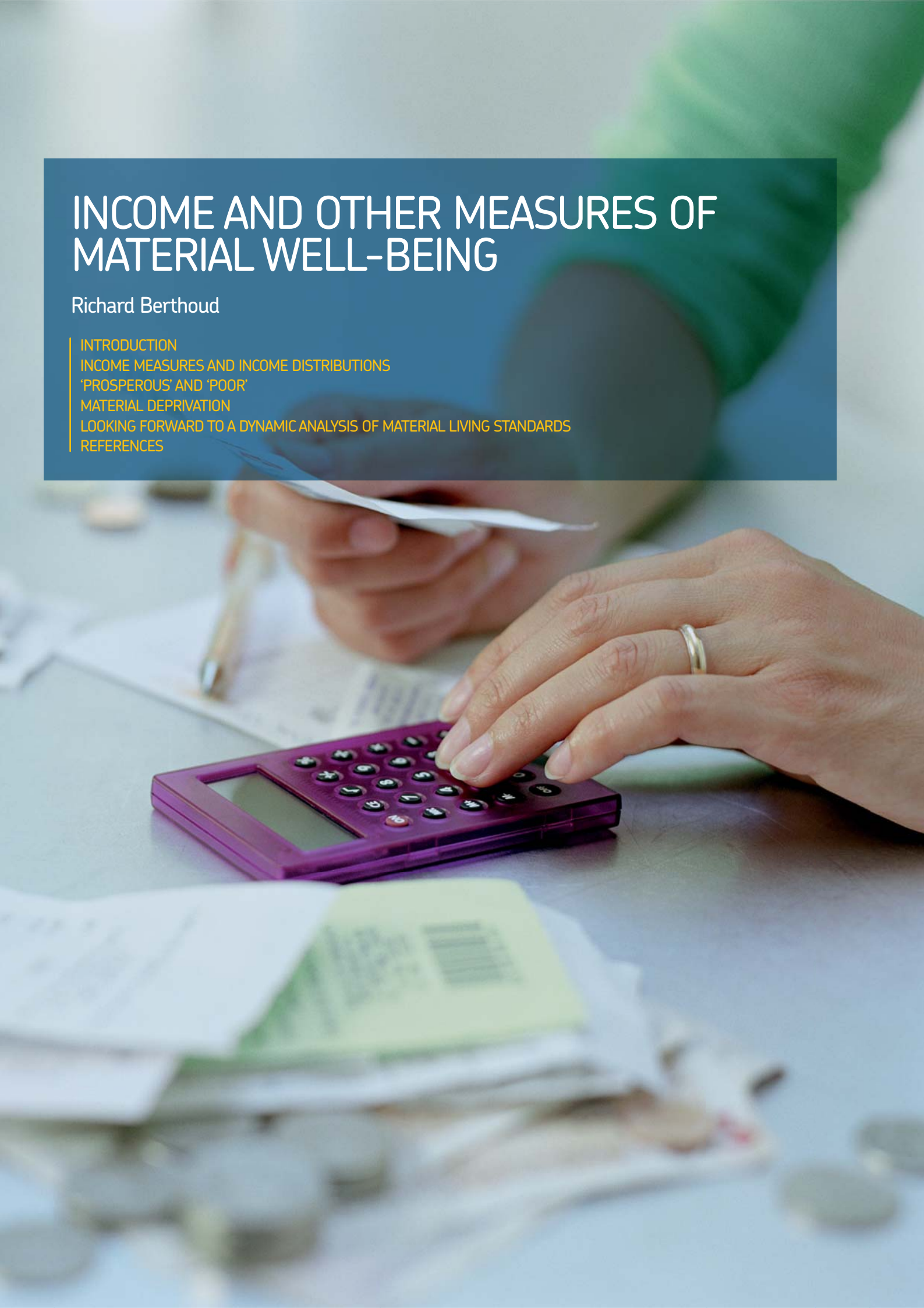
INCOME AND OTHER MEASURES OF MATERIAL WELL-BEING

Richard Berthoud



INTRODUCTION

The need to understand how incomes change over time was the primary motivation for the first household panel survey – the Panel Study of Income Dynamics (PSID) – launched in the USA in 1968 and still going strong (Bane & Ellwood, 1994). Now that the data spans more than a generation, the PSID provides social scientists with unparalleled insights into income mobility in America, both across the adult life course, and between parents and children. The British Household Panel Survey (BHPS) has provided equivalent data for Britain since 1991, and has remained the primary source of data on changes in individuals' material well-being over time. *Understanding Society* has been designed to continue that sequence, using a much larger sample of households across the UK.

Trends in the growth – or decline – in the national average income are among the key indicators on which governments are judged, and by which countries are compared. Surveys measuring the incomes of households provide important data about the distribution of income across the population, from rich to poor. Income is not the only component of material well-being, but it provides access to a very wide range of goods and services, can be measured in clearly calibrated units, and is often seen as representing a badge of social status. But when commentators say that living standards have been rising or falling (and infer that people are contented or disgruntled as a result) their analysis of the average conceals the fact that many individuals see increases or decreases in their income from year to year which far outstrip national trends. These dynamics, and an analysis of their causes and consequences, are the province of household panel surveys (Bradbury, Jenkins & Micklewright, 2001; Jenkins & Micklewright, 2007).

Income is not the only direct measure of material resources that will be available in the *Understanding Society* dataset. Analysts may be interested in individual elements of income, for example in the receipt of particular types of benefits. In Wave 2 (already in the field), there is a set of questions on savings and credit commitments. A sequence of questions about capital financial assets is planned for Wave 4.

Money – whether income or capital – provides direct access to consumption and material living standards. These are captured by three sets of questions which collectively measure material deprivation, analysed and discussed later in this chapter.

The income data were collected in 2009. The figures are obviously affected by the fact that a recession was in progress at the time of the interviews, but without a time series we have no direct way of knowing what difference the downturn in the economy has made.

The purpose of this chapter is to give an overview of measures of income and material well-being which are available in *Understanding Society*. It provides illustrative results so that analysts can get a sense of measures available for their own research. While this chapter focuses on income as an outcome, it is also of major importance as a predictor or explanatory variable.

The chapter discusses the measurement and distribution of gross household income in *Understanding Society* and in comparison with the Family Resources Survey (FRS) (Department for Work and Pensions, 2010a). It also presents the distribution of gross, net and equivalent incomes, which have varying meaning for how socio-economic resources are experienced by households. The next section focuses on the upper and lower ends of the income distribution, labelled prosperity and poverty. It presents the rate of poverty for households with different characteristics. The following section summarises several measures related to material deprivation in terms of lifestyles, financial stress and ownership of consumer durables. The chapter concludes with an assessment of opportunities for research when longitudinal data will be available.

INCOME MEASURES AND INCOME DISTRIBUTIONS

THE DISTRIBUTION OF GROSS INCOME

The *Understanding Society* questionnaire collects very detailed information about the incomes of each member of every household – covering earnings, self-employment profits (or losses), social security benefits, interest and dividends, and so on. The questions, with a couple of exceptions, aim to collect information on income in the most recent month.

The first task is to add together all the income received by each person; and then to sum the incomes of all the people, to calculate a total for the household. Checks have to be made that all the relevant amounts have been reported – and because the total is based on so many questions, each concerned with a separate component of income, it turns out that there is some information missing from nearly half of all cases. Rather than understate income where it has not been fully reported, the next step is to fill in best estimates of the missing values by imputation – a routine which works out the most likely correct answer to each question. This can be very straightforward (e.g. calculating the amount of Child Benefit based on the number of children in the family) or more complex (e.g. working out the average earnings of

men and women in a particular occupation, and assigning that average to individuals in that occupation whose earnings were not given). The interim data analysed here is provisionally based on a fairly simple imputation formula. It will be developed further as the Wave 1 dataset is finalised, and developed again when the Wave 2 results become available to help us work out what the Wave 1 answers might have been. Thus, the eventual income and material well-being distributions will vary from this preliminary examination.

Table 1 summarises the whole of the reported distribution. The household with the lowest income reported a net loss of nearly £150,000 per year, having had a bad year in self-employment. The household with the highest income made nearly £5 million per year.

A civil servant couple, with two children, with his full-time earnings of £40k plus her half-time earnings of £20k and Child Benefits would be on the margins of the richest 10 percent of households in Britain

The shape of this income distribution is very similar to the patterns reported by other surveys in this country and across the world, with a large number of not-very-well-off households slightly below average, balanced by a small number of very prosperous households well above average (illustrated in Figure 1). The most common single household income was only £1,000 per month (see the peak in the graph at Figure 1). The income achieved by the top 5 per cent of households is substantially greater than the sum of the amounts received by the bottom 50 per cent of households.

Readers can gain a normative perspective by working out where their own household income would have been placed if they had been respondents to the survey. For example a civil-servant couple with two children, with his full-time earnings of £40K plus her half-time earnings of £20K, would reach the 90th percentile once their Child Benefit was added in. They would be on the margins of the richest 10 percent of households in Britain.

Table 1 Percentiles of the full distribution of gross household income, expressed as weekly, monthly and annual amounts

	Weekly	Monthly	Yearly
Lowest	-£2,838	-£12,298	-£147,573
1st percentile	£0	£0	£0
10th	£145	£628	£7,540
25th	£278	£1,206	£14,472
50th	£522	£2,264	£27,162
75th	£832	£3,603	£43,240
90th	£1,215	£5,263	£63,160
99th	£3,162	£13,703	£164,441
Highest	£93,905	£406,920	£4,883,039

It is a feature of income distributions that it is more difficult to observe and interpret the very highest and lowest reported incomes. Small samples with high variances are subject to substantial sampling error. There is evidence to suggest that very high or low incomes are often temporary, and therefore an unreliable guide to the family's underlying resources. For these reasons, most of the following analysis focuses on a slightly truncated income distribution, from which the top and bottom of the range have been excluded.[1]

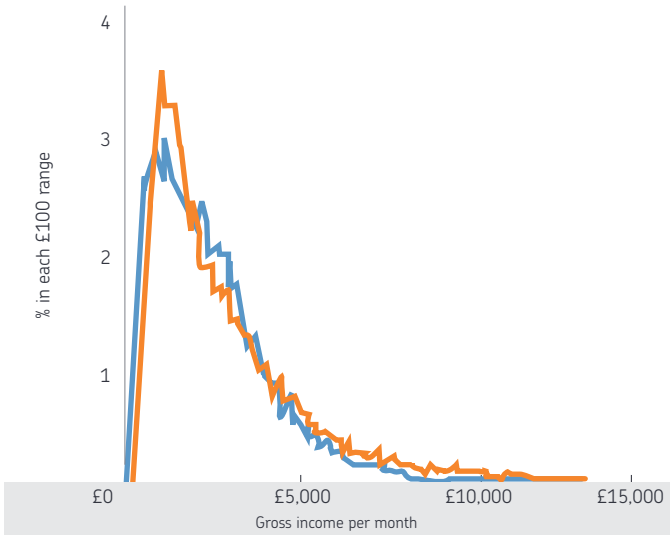
Figure 1 illustrates the distribution of income, comparing the *Understanding Society* distribution of gross income with the distribution reported by the DWP's specialist income enquiry, the Family Resources Survey (Department for Work and Pensions, 2010a), which provides the basis for official income statistics.[2] Of course the FRS is also a survey, and faces exactly the same issues about sampling error, non-response bias, measurement error and imputation routines as *Understanding Society*.[3] The left hand panel plots the distribution in standard arithmetic; the right hand panel plots the X-axis on a logarithmic scale, as this gives a clearer view of the lower values. Both surveys have the expected 'skewed normal' distribution. In detail, the FRS has a sharper and higher peak. By comparison, the current *Understanding Society* data reports more households below £1,000 per month, fewer at about £1,000, more in the range £3,000-£4000 and fewer between £6,000 and £8,000. We will keep an eye on these apparent discrepancies as we further develop and finalise the *Understanding Society* income variables.

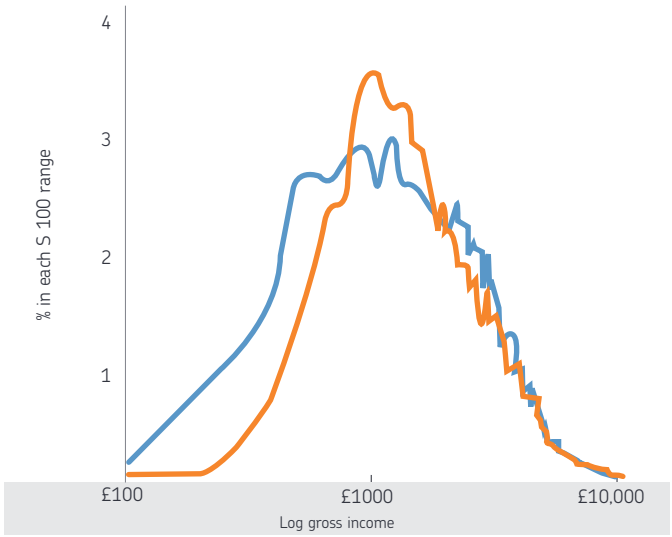
[1] The excluded households are those with zero or negative reported incomes, plus the top and bottom 1 per cent of the positive reported incomes. Exclusions totalled 4.3 per cent of the households in the sample.

[2] The Family Resources Survey, made available by the UK Data Archive, provides a comparison with *Understanding Society* based on a well-established specialist income survey. Figures labelled in this chapter as derived from the FRS are based on direct analysis of the 2008/09 Households Below Average Income (HBAI) dataset, not the results reported in the official HBAI publication (Department for Work and Pensions, 2010b). All FRS money figures are adjusted to make them more directly comparable with *Understanding Society*, first to convert weekly to monthly amounts, and second to take account of the different averages for surveys taking place 9 months apart. The adjustment consisted of multiplying all FRS amounts by the ratio of the medians of the (truncated) distributions.

[3] The FRS distribution has been truncated using the same rules as have been applied to the *Understanding Society* data (see note 1).

Figure 1 Distributions of gross income in *Understanding Society* and the Family Resources Survey





UNDERSTANDING SOCIETY FRS

UNDERSTANDING SOCIETY FRS

NET EQUIVALENT INCOME

A household's gross income is of interest in its own right, but not necessarily the best estimate of the resources available to its members. Income analysts prefer to work with net income, the amount available for spending after direct taxation has been taken into account.

The *Understanding Society* team is developing a procedure for calculating the net income of each household, using a tax/benefit model to calculate how much tax would be levied on each individual's income. This precise estimate of net income will be available in the full Wave 1 data release. For the present, we illustrate the differences between gross and net income using a simple estimate derived from the Family Resources Survey (Department for Work and Pensions, 2010a).[4] There is no pretence that this formula offers highly accurate data for specific sample households, but it can be used to illustrate the overall pattern of net incomes. It is in the nature of the taxation system, as reflected in the formula, that the distribution of net incomes is less unequal than that of gross incomes – as will be illustrated below.

A second adjustment to reported income needs to be made before it can be analysed as the primary indicator of living standards. It is assumed that a large household needs more income to maintain a given standard of living than a small one. So it is usual to divide net income by a measure of household size, to yield an estimate of income which can be thought of as akin to income 'per head'. The measure of household size is known as an equivalence scale,[5] and the income concept as 'equivalent income'. The latter is usually used as the primary base for comparing household incomes.

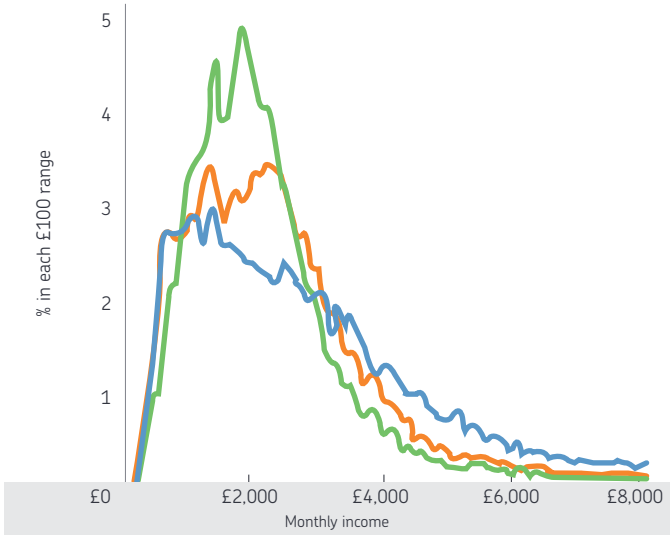
[4] The algorithm for converting reported gross income to an estimate of net income is derived empirically from analysis of the FRS dataset (see note 2), in which both gross and net income are known. It takes the form:
net income = gross income up to a threshold
+ 63% of gross income above that threshold.
The threshold varies according to the size of the household and the age of its members, as follows:

	Containing no-one of pensionable age	Containing anyone of pensionable age
One adult	£1,127pm	£1,180pm
Two adults	£1,576pm	£1,809pm
Three or more adults	£2,022pm	£2,096pm

Because larger households tend to have higher gross incomes than small households, the effect of equivalisation is to narrow the range of the distribution even further.

Figure 2 illustrates the differences between the three measures of (truncated) income. There is very little difference between them at the lower end of the distribution – up to about £700 per month. Above that level, net income is less unequal than gross income – with more households in the range £1,000 to £3,000, and fewer in the range above £3,000 per month. Equivalent income is less unequal again.

Figure 2 Distributions of gross, net and equivalent incomes in *Understanding Society*



GROSS NET EQUIVALENT

Note: The horizontal scale is cut off at £8,000 per month.
Small numbers of actual values ranged up to nearly £14,000

[5] The equivalence scale used in this chapter is the modified OECD scale.

These differences can be summarised by reporting the ratio of the 90th to the 10th percentile of each of the three measures:

For gross income	7.0:1
For net income	5.2:1
For equivalent income	3.9:1

It is the distribution of equivalent net income that actually matters for families' living standards, and for social policy. In a representative group of 100 households, the tenth from the top of the list enjoys an income nearly four times the income of the tenth from the bottom. The method of calculation clearly affects the position of particular households. For example our civil-servant couple whose £60K combined earnings plus Child Benefit placed them near the 90th percentile of the distribution of gross income, and just below the 80th percentile of equivalent income.

'PROSPEROUS' AND 'POOR'

Analysis of the overall distribution of income may often seem an abstract exercise, because most households are bunched fairly close together, and because there is no obvious basis for deciding whether the range (e.g. the 3.9:1 ratio between the 90th and 10th percentiles) is 'too wide' or 'too narrow'. Analytical attention would be focused more appropriately on the tails of the distribution – the 'prosperous' and the 'poor'.

In practice, surprisingly little attention is paid to the upper end of the distribution. Having a very large income is hardly a problem for the people concerned, but those people exercise an obviously substantial purchasing power, and a less obvious but massive political power. It is they who largely determine public opinion through the media and in parliament. Moreover, it has often been argued that the problem of poverty is a direct consequence of the problem of wealth. So there is a strong case for much more detailed analysis of the 'prosperous' end of the income spectrum.

Much more attention has been paid to the 'poor' end of the spectrum, because it clearly is a problem for the people concerned. The welfare state, established in 1948 in the light of the Beveridge report, was at first assumed to have abolished poverty, but by the 1960s and '70s it became clear that relative poverty persisted in spite of generally rising living standards (Townsend, 1979). Using 60 per cent of the median income as a conventional benchmark, official figures from the HBAI (Department for Work and Pensions, 2010b) series have shown that the overall relative poverty rate increased rapidly over the course of the Thatcher administration, stabilised during the Major years, and declined under Blair.

In 1998 the then government declared its commitment to end child poverty within 20 years, with an intermediate objective of halving it within 10 years. Official estimates (Department for Work and Pensions, 2010b) show that there was a substantial reduction in child poverty between 1996 and 2004. The decline was especially marked between 1998 and 2001, largely as a result of improvements in Child Benefit rates and tax credits for families with children. But there has been no improvement since 2004. The intermediate aim of halving child poverty by 2010 seems a long way off.

The present coalition government is obliged by law to monitor progress towards the child poverty targets set by the outgoing administration. Its own independent *Review of Poverty and Life Chances* has concluded that parenting skills, rather than income in its own right, are largely responsible for the transmission of poverty from generation to generation (Field, 2010).

It has to be acknowledged that household surveys are not especially effective at measuring the situation of the *very* richest and the very poorest members of society. First, very wealthy people are unlikely to take part, and if they did they might well under-report their resources. The very poorest people, living rough or in hostels, would never be selected into a sample based on households in private accommodation. Second, there is evidence (Berthoud & Bryan, 2011) that the households who report the highest and lowest incomes do not report correspondingly extreme living standards, either very high or low.

Hence the decision, explained earlier in this chapter, to exclude the extremes of the income distribution from much of the analysis. Of course, this truncation automatically reduces the number of families observed to be prosperous or poor, but it may nevertheless offer more reliable evidence about the extent of inequality. In what follows, we have defined the 'poor' as households whose net equivalent income is below 60 per cent of the median of the truncated distribution. Conversely a group of 'prosperous' households has been identified as consisting of those whose net equivalent income is above 167 per cent of the median.[6] Table 2 records the poverty and prosperity rates derived from *Understanding Society*, and compares them with estimates calculated in the same way from the FRS. About one household in six is in poverty according to both surveys. Poverty rates are higher than average for pensioners,[7] and for families with children. In all cases the *Understanding Society* poverty rate is slightly higher than the FRS rate. In contrast, the *Understanding Society* prosperity rate of 13 per cent is markedly lower than that derived from the FRS, and this is especially true for households with children.

[6] This is the converse of the poverty line, because 1/0.6 = 1.67.

[7] Note that the poverty rate derived here from the FRS is *not* the same as the official HBAI figure. It is based on the truncated distribution of predicted net incomes, to maintain comparability with the *Understanding Society* estimates.

Table 2 Rates of 'poverty' and 'prosperity' derived from the truncated distribution of predicted net equivalent income (row percentages)

	Poor %	Middle %	Prosperous %
Understanding Society			
All	18	69	13
Pensioner households[8]	23	70	7
Households with children	20	72	8
Family Resources Survey			
All	16	65	19
Pensioner households	17	74	9
Households with children	19	66	15

*Note: Pensioner households are defined as containing any member above pensionable age

Households with high poverty rates include large families and lone parents, non-pensioners without a job, those without qualifications, and Pakistanis and Bangladeshis

No doubt researchers will spend many months analysing these income figures and poverty rates in much more detail – especially when the panel data become available to show how people switch into and out of 'poverty' and 'prosperity' from year to year. Just to give a flavour of some potential lines of enquiry, Table 3 shows some of the household characteristics which are associated with poverty. Households with exceptional poverty rates include large families and lone parents, non-pensioners without a job, those without qualifications, and Pakistanis and Bangladeshis. Poverty is also well above average for older pensioners, tenants, severely disabled people,[9] Africans and households in Wales and Northern Ireland.

The right hand column of Table 3 reports the number of households interviewed in each of the categories identified in the dataset so far available, as an indication of the analytical opportunities. This is a substantial understatement of the samples that will eventually be available:

- The existing dataset covers only the first half of Wave 1, and we can assume that the general population sample will eventually be twice as large;

Table 3 Estimated poverty rates derived from *Understanding Society* Wave 1 Year 1

	Poverty rate %	Sample size (General Population Sample Wave 1 Year 1)
All households	18	13,505
Households including someone over pension age	23	4362
...someone over 75	30	1,652
Among non-pensioner households		
Households with children	20	4,521
Households with four or more children	64	187
Lone parent households	47	770
Households with no worker	64	1,708
Households whose members have no qualifications	41	934
Households renting their accommodation	31	3,563
Households including a disabled person	22	2,061
...a severely disabled person	31	755
Households containing any Indian	14	250
...Pakistani or Bangladeshi	40	184
...Caribbean	22	233
...African	30	244
Households in England	15	7,585
...in Wales	20	442
...in Scotland	17	823
...in Northern Ireland	20	891

- Households will be added from the old BHPS from Wave 2 onwards (and will add especially to the number of households covered in Wales, Scotland and Northern Ireland);
- The ethnic minority boost will add about 4,000 households to the sample of target minority groups, and will also contribute to coverage of other disadvantaged categories (e.g. large families, lone parents).

[8] All the analysis in this chapter is based on income before housing costs. When discussing pensioner poverty, it is common to use an after-housing-costs measure as most pensioners own their homes outright.

[9] Severely disabled people are those reporting three or more types of impairment. This is not a direct measure of severity, though the number of impairments is known to be strongly correlated with severity. Poverty rates are typically under-estimated for severely disabled people, because the Disability Living Allowance and Attendance Allowance are counted as contributing to their income, but equivalence scales do not take account of the additional needs associated with disability (for which DLA and AA are intended to compensate).

MATERIAL DEPRIVATION

An obvious assumption is that households with high incomes will enjoy high living standards, while those with low income will be deprived. This section uses three sets of *Understanding Society* questions to show, first, that deprivation indicators broadly confirm the expected relationship between income and living standards; but second, that other household characteristics appear to influence the standard of living that can be achieved from a given income.

The three deprivation indicators are as follows:[10]

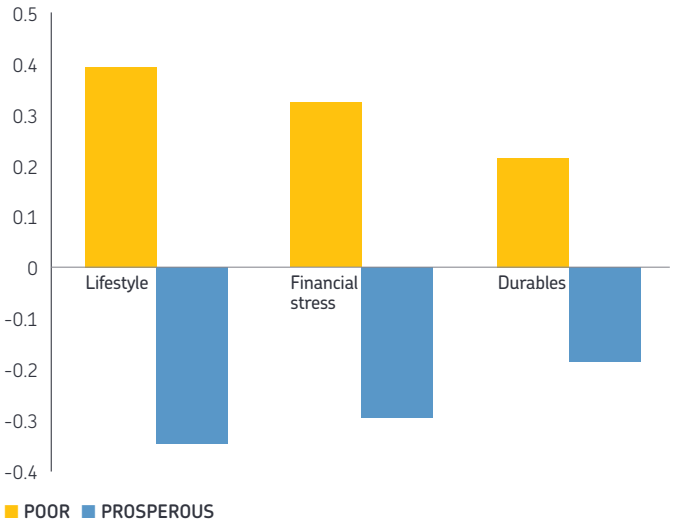
- A set of nine questions indicating lifestyles.[11] The questions ask about whether the respondent or family have items on the show card or not. Sample items include 'having a holiday away from home for at least one week a year, whilst not staying with relatives at their home' and 'enough money to keep your house in a decent state of repair.'
- A set of four questions indicating financial stress: difficulties paying housing costs, council tax or credit commitments, plus an overarching question on whether people felt they were making ends meet.
- A set of 13 questions about the possession or use of consumer durables, ranging from a colour TV to a mobile phone.

Of the measures of deprivation, poor and prosperous households are most different in lifestyle deprivation and least for consumer durables

Three measures of deprivation were constructed to average zero across all households. Cross analysis between the three measures shows that there was a strong tendency for households reporting lifestyle deprivation also to report financial stress (r=0.57). But the measure of lack of consumer durables was less closely associated with the other two measures of derivation (the correlation between durables and lifestyle deprivation = 0.25; between durables and financial stress = 0.20).

Of course, the main reason for enquiring about living standards is to show how far lack of resources (especially income) leads to deprivation. This relationship is clearly crucial to an analysis of the broader concept of poverty. Figure 3 provides a simple illustration of the fact that 'poor' households experience above-average levels of deprivation, while 'prosperous' households are well below average in this respect. Of the three measures of deprivation, the difference between poor and prosperous households is most marked for the measure of lifestyle deprivation, less marked for financial stress and least for consumer durables.

Figure 3 Average deprivation scores for households defined as 'poor' and 'prosperous' on the basis of their net equivalent income



The relationship between income and deprivation is not as simple as might at first appear, and deserves more detailed exploration. Table 4 offers four views, each based on a different formulation of a regression equation using income (and other characteristics) to predict the extent of 'lifestyle' deprivation experienced by a particular household.

- Considering households of all ages, there is a strong tendency for those with high (log) incomes to report low lifestyle deprivation scores (-0.493). But pensioner households have much lower deprivation scores than their level of income would have led us to expect.[12]
- If attention is confined to non-pensioner households, the effect of (log) income appears stronger (-0.58).
- Among non-pensioner households, deprivation scores are
  - higher than income might have led us to expect among families with children (especially lone parents);
  - lower among households containing workers, households containing well qualified people, and owner occupiers;
  - higher among households containing (severely) disabled people, and ethnic minorities (apart from Indians);
  - The direct effect of income is much lower (-0.30) once these other household characteristics have been taken into account.

But note that all the types of household with exceptionally high or low deprivation scores also tend to have low or high household incomes. The fourth view presented in Table 4 substitutes a measure of the (log) income that each household would be expected to have, based on the characteristics listed as contributing to view 3.[13] This latter measure of predicted income might be interpreted as a stable indicator of underlying income. It is more than

[10] For each of the three indices, each of the component questions was scored between 0 and 1. They were then standardised (Z scores) before being added together in an index which in principle assigned equal weights to each item. Cronbach's alpha (a measure of how closely related a set of items is) was 0.81 for the lifestyle index, 0.64 for the financial stress index and 0.68 for the consumer durables index.

[11] The lifestyle question sequence is copied from the Family Resources Survey, but the analysis here derives indices that differ from those used in the DWP's former Opportunity for All indicators, or in recent HBAI reports. The FRS sequence of questions about the living standards of children is included in *Understanding Society*, but has not been analysed in this chapter.

[12] The low apparent rate of deprivation reported by pensioner households (in spite of their low incomes) has been much discussed and researched, and may be attributable to variations in the way older people perceive subjective issues such as 'cannot afford'. A new set of deprivation questions, especially for pensioners, has now been added to the FRS (McKay, 2008).

[13] Predicted log income is derived from a regression equation in which the log of equivalent income was estimated as a function of the variables listed in Table 4, from 'household contains any children' to 'household contains any African'. R2 for this equation was 0.40.

Table 4 Four views on the relationship between current income and 'lifestyle' deprivation

	All households	Among non-pensioner households		
	View 1	View 2	View 3	View 4
Log equivalent net income	-0.49	-0.58	-0.30	-0.30
Household contains anyone of pensionable age	-0.31			
Household contains any children			0.10	
Lone parent household			0.09	
Household contains anyone in work			-0.218	
Household contains anyone with further or higher education			-0.158	
Owner occupier			-0.35	
Households contains any disabled person			0.10	
...person with three or more impairments			0.11	
Household contains any Indian			-0.04^{ns}	
...Pakistani or Bangladeshi			0.11	
...Caribbean			0.17	
...African			0.13	
Predicted log income (see text)				-0.61
Constant	3.78	4.46	2.68	7.52
Sample size*	13,310	9,304	8,717	8,717
R^2	21%	23%	33%	29%

*Samples for views are composed as follows

1 All households with income within the truncated range
2 Non-pensioner households within the truncated range
3 Non-pensioner households within the truncated range with a complete set of interviews with adults
4 Non-pensioner households within the truncated range with a complete set of interviews with adults

twice as powerful as current income at predicting lifestyle deprivation, and explains almost as much of the variance (R^2) as the full equation containing many more predictors (View 3).

LOOKING FORWARD TO A DYNAMIC ANALYSIS OF MATERIAL LIVING STANDARDS

This chapter has illustrated some of the conclusions about the distribution of income, and about poverty, that can be reached from a cross-sectional analysis of income and of deprivation indicators in *Understanding Society*. The content of the chapter could just as easily have been derived from a specialist income survey, such as the FRS — and comparison with the FRS has helped to put into context the measures available from *Understanding Society*.

We also examined the two ends of the income distribution: poverty and prosperity. Researchers from many disciplines and perspectives will take up analyses related to them, particularly poverty.

Measures of material living standards in the first wave of *Understanding Society* have much to offer, even viewed as a cross-section of households at one point in time. Think of the opportunities to examine the relationships between material living standards and all the other wide range of topics covered by the survey: obesity, sleep patterns, political attitudes, ethnicity, disability, education, neighbourhood characteristics and others.

But the survey will come into its own when a series of measures of living standards becomes available for members of the same households over a sequence of years. *Understanding Society* will offer on a large scale what the BHPS has so far provided on a smaller scale — a picture of how families' living standards evolve from year to year over the life course.

The BHPS provides evidence about these dynamics. It has been used, for example, for the DWP's annual Households Below Average Income analysis (Department for Work and Pensions, 2010b), to show how many people have been 'persistently' or 'occasionally' below the low income threshold over four-year periods. But it is becoming increasingly clear that single measures of 'this year's' income do not provide the most reliable measure of underlying living standards.

Several sources suggest that some families whose reported income increases from below to above the poverty line between one year and the next may hardly notice the difference (e.g. Jenkins & Rigg, 2001, Berthoud & Bryan, 2011). Such research has found that:

- Many such transitions appear to occur independently of the shifts in family structure, or employment status, which might have been expected to cause a meaningful change in socio-economic position.
- Apparent transitions out of low income are only weakly followed by reductions in deprivation.
- And the most powerful predictor of who will fall below the poverty line in the next year is who rose above it in the last year.

These findings suggest that short-term transitions in reported income are not reliable measures of social dynamics (Berthoud & Bryan, 2011). The point can be illustrated by comparing the observed relationship between income and deprivation scores in the BHPS using four different time frames:

Comparing this year's income with this year's deprivation score, in a single year	R^2 = 14%
Comparing average incomes with average deprivation scores, over a nine year period ('between effects')	R^2 = 22%
Comparing increases and decreases in income, with increases and decreases in deprivation, over a nine year period ('within effects')	R^2 = 4%
Comparing changes in 'this year's' income and deprivation, with 'last year's', over two consecutive years	R^2 = 2%

These findings from the BHPS clearly show that it is *underlying* income (measured over several years) which affects *underlying* living standards (also measured over several years), and that single measures do not clearly indicate either the relationship between income and deprivation, or the dynamics of that relationship. The point is reinforced in the *Understanding Society* data by the fact (reported in Table 4) that material deprivation is more closely associated with the level of income predicted from household characteristics than with actually observed income. These considerations indicate the importance of measures of underlying living standards, rather than point estimates of current income. There are two potential approaches:

- Taking an average of household income over a period of three, four or five years. This provides estimates of 'chronic' poverty (Hill & Jenkins, 2001). The advantage of such a measure is that it irons out short-term fluctuations in living standards. The disadvantage is that a long series of survey waves is required to observe and interpret changes in people's 'underlying' position over time. On the other hand, it can be argued that it is long-term changes, rather than short-term fluctuations, that matter for families.
- Using a wide range of variables – such as household characteristics, income, deprivation scores and others – to summarise or to 'predict' households' underlying living standards. The advantage of such a measure is that it can reveal changes in prosperity or poverty from year to year. The disadvantage is that a measure derived from a wide range of input variables is not so easy to interpret, and has no very direct implications for income maintenance policy.

The research agenda for *Understanding Society* will include how underlying living standards change over the years, as people move into and out of work, up and down the career ladder, into and out of relationships and parenthood, into disability, into retirement and so on. And, in the longer term, how far poverty in childhood is predictive of continued poverty among adults; and how far disadvantage in working life is predictive of poverty among pensioners.

Another main research objective will be a clearer view of the extent to which high and low material living standards are associated with advantage or disadvantage in other domains of social and economic life: with political influence, educational attainment, social participation, healthy lifestyles and so on. The *Understanding Society* dataset will offer unique opportunities to explore these relationships over time.

It is sometimes argued that 'poverty' is a multidimensional concept, and that lack of political influence, poor educational attainment, absence of social participation, unhealthy lifestyles and so on should all be included in an overarching measure of 'social exclusion'. *Understanding Society* has data that would permit such measures to be constructed. By contrast, our own view is that these relationships should be studied, rather than assumed. The word 'poverty' is unequivocally associated with a lack of material resources. There are probably better measures of a household's underlying material resources than current net income, but it would not be helpful to confuse the causes and the potential outcomes in a single measure of exclusion.

This chapter has been designed to whet the appetite of analysts and policy makers for the new conclusions about material resources that can be derived from *Understanding Society*. The chapter has said little that is new, largely confirming that the new dataset is consistent both with the specialist FRS and the earlier, smaller-scale, BHPS. Analysis of the dynamics of income and of deprivation, and of variations between social groups, is one of the primary objectives of the new study, with its very large sample and very wide topic coverage. Like fine wine or good cheese, *Understanding Society* will get better and better as the years elapse. The prospect is mouth-watering.

Sample Size

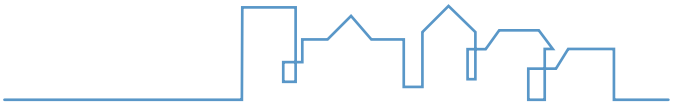
Much of the analysis was conducted on a sample which excluded households with extreme values of household income for a sample size of 13,505 households. The excluded households are those with zero or negative reported incomes, plus the top and bottom 1 per cent of the positive reported incomes. Exclusions totalled 4.3 per cent of the households in the sample.

Findings

The distribution of several income measures from *Understanding Society* is broadly similar to those derived from an analysis of the Family Resources Survey (FRS) for 2008-2009. In each survey about one in six households are classified as poor. The percentage in poverty from *Understanding Society* is higher than that found in the FRS for pensioners and households with children.

Estimated poverty rates are higher for households with persons of pension age, lone parents, those with four or more children, or with a disability. In addition, households whose members do not have educational qualification or an employed person or who rent their home are more likely to be poor.

Examining three measures of material deprivation, the difference between segments denoted as prosperous and poor is larger for lifestudy deprivation (for example, having a holiday away from home) than for financial stress or having a set of consumer durables. The gap is smallest for owning and having the use of consumer durables.



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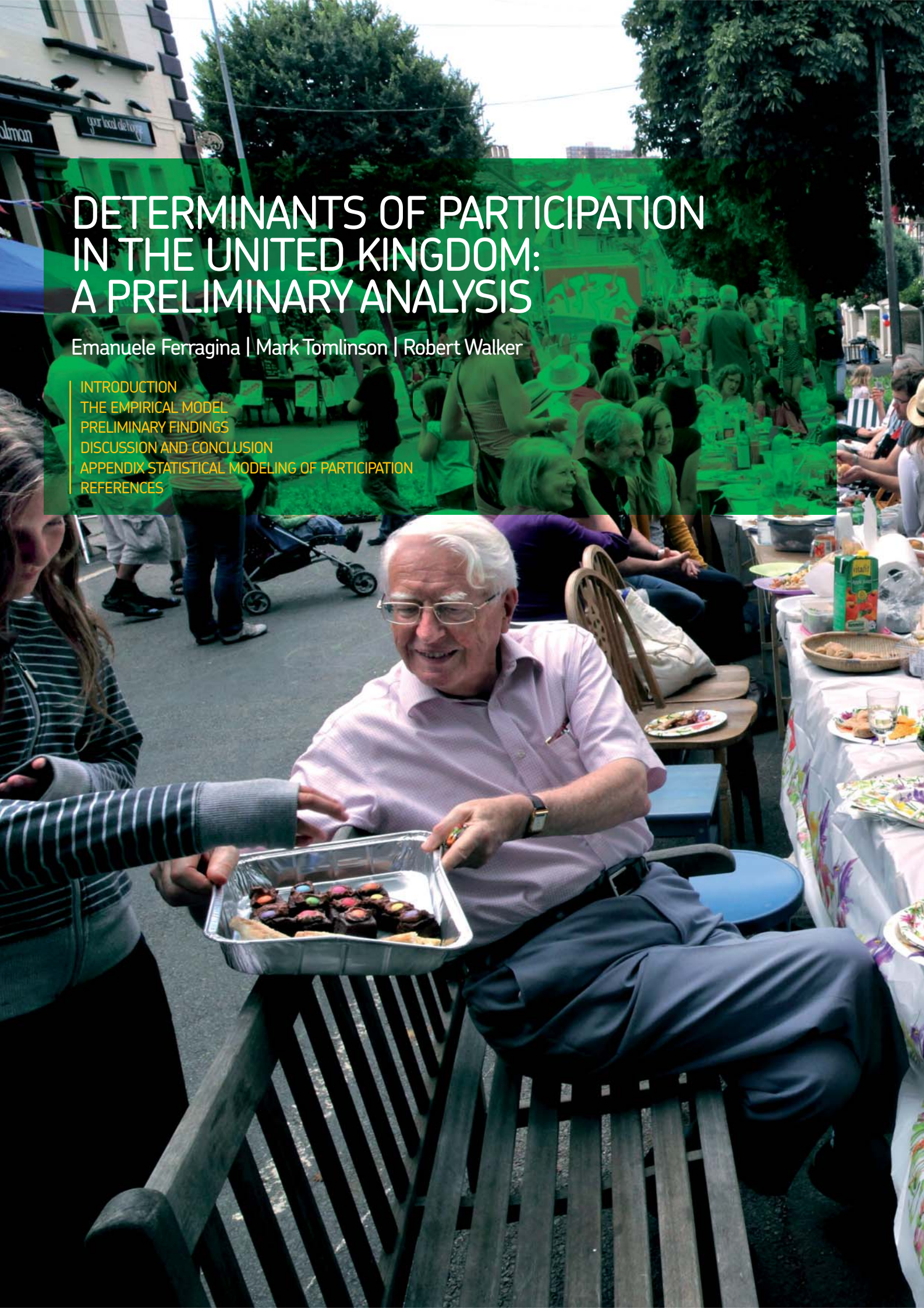

DETERMINANTS OF PARTICIPATION IN THE UNITED KINGDOM: A PRELIMINARY ANALYSIS

Emanuele Ferragina | Mark Tomlinson | Robert Walker

INTRODUCTION

Society is bound together through the participation of its members, who, in turn, share the benefits that flow from participation: social, material and political resources; a sense of identity and belonging; and the reciprocity that makes for citizenship. However, the characteristics and norms of participation are constantly evolving, including some people while excluding others. This chapter presents a preliminary analysis of data from *Understanding Society* to explore the factors associated with participation and, thereby, begins to prepare a baseline against which change can be measured in future years.

We define and measure participation as a multidimensional concept[1] combining social participation and consumption. This strategy is based on the premise, following Peter Townsend (1979) and many others subsequently, that in a capitalistic society the inability to afford a certain level of consumption excludes people from full participation in society. Therefore our analysis of participation embraces traditional measures of social participation as well as indices derived from studies of poverty and material deprivation. In the analysis reported below, in order to understand how participation varies within the British population we examine the correlations among the six dimensions of participation and their relationships with major socio-demographic variables.

Social participation comprises three dimensions: neighbouring, general trust and interest in politics. Whereas neighbouring reflects informal participation, general trust is included as a proxy for participation in formal organisations, since trust has been found to be strongly correlated with participation[2] (Putnam, Leonardi & Nanetti, 1993).

Social participation has long been studied by sociologists (Parker, 1983). De Tocqueville, credited as the father of this literature, compared American and French attitudes toward social and political participation (1961). Later, Tönnies (1955), Durkheim (1893), Simmel (1969) and Weber (1946; 1961) reflected on the relation between participation, strong and weak social ties, and modernisation. They were concerned that modernity resulted in a reduction in bonding ties and in rising alienation and anomie in society (Durkheim, 1893; Ferragina, 2010). Mass society theorists (Bell, 1962; Nisbet, 1969; Stein, 1960; Whyte, 1956) revisited these ideas during the 1950s and 1960s to argue that the widespread tendency to positively view the relinquishing of traditional communal duties, as increasing individual freedom, inevitably led to 'disenchantment' and 'alienation' (Nisbet, 1969, p. 10). The decline of the level of social participation was thought to be the inevitable price to pay for modernity. This theoretical analysis has received empirical support in the last 20 years (Putnam et al., 1993; Fukuyama, 1995) with the development of social capital theory (Ferragina, 2010). The three components selected to measure social participation reflect empirical and theoretical advances in this literature (Paxton, 1999; Costa & Kahn, 2003; Hall, 1999; Rothstein, 2001; Knack & Keefer, 1997; Van Oorschot & Arts, 2005). Neighbouring captures informal social participation, while general trust and interest in politics capture participation in formal organisations.

In consumer oriented societies, individuals also actively participate in society through their consumption, use, and display of a wide variety of products and services. A long line of sociological inquiry traces the importance of consumption to display wealth in the form of conspicuous consumption (Veblen, 1994) or to distinguish oneself from others and to show the belonging to a group (Bourdieu, 1984)[3]. In this sense, consumption is a form of participation.

The consumption component of participation is represented by three dimensions: material, social and environmental consumption[4]. Material, social and environmental consumption relate to the ability to participate in society from three different points of view. Material consumption summarises the ability to afford durable goods which are necessary in day to day life. Social consumption relates to expenditures that support or 'lubricate' social relationships (e.g. a meal with friends and family). Environmental consumption is a new dimension of participation added in recognition of the growing green consciousness. People who are able to afford, or willing to afford, environmental goods, prioritise expenditures that ostensibly bring social, as well as individual, benefits.

In order to investigate the variation in patterns of participation, the analysis is undertaken in two linked stages (through a MIMIC, multiple indicator multiple cause model). First, confirmatory factor analysis is used to specify and measure the dimensions of social participation and consumption identifiable from the *Understanding Society* survey. Secondly, the participation variables are simultaneously regressed on income, education, region of residence, age, ethnic background, gender and family composition to understand how participation varies according to each of these individual characteristics.

Understanding Society is particularly valuable because of the wide range of measures relevant to social participation. Future waves will provide additional measures and permit longitudinal analyses. This analysis is able to exploit measures of respondents' views on environmental or 'green' expenditures. The study is also methodologically innovative in its use of MIMIC models that take account

[1] Unfortunately cultural aspects of participation (such as social norms) cannot yet be taken into account due to absence of questions in the *Understanding Society* study.
[2] Measures of participation in voluntary associations and the amount of time spent in voluntary work will be included in the second wave of the *Understanding Society* dataset.
[3] More recent sociological investigations have dealt with 'postmodern' lifestyles via the 'omnivorousness' thesis (Peterson, 1992; Peterson & Simkus, 1992; Peterson & Kern, 1996).
[4] This last component is an innovative feature of *Understanding Society*.

of the relationships between the different dimensions of consumption while simultaneously establishing how each dimension is related to an individual's social and demographic characteristics (Jöreskog & Goldberg, 1975; Muthén, 1989; Brown, 2006).

In the next part of the chapter, the rationale behind the statistical analysis is explained with the creation of latent factors to measure participation and explanatory models based on linear regressions within the MIMIC framework. The results of the statistical analysis are then presented, before concluding with reflections on the broader significance of the findings and the potential of the *Understanding Society* data to help us to monitor and better understand the social participation that weaves the social fabric we call society.

THE EMPIRICAL MODEL

The analysis is based on the first year of Wave 1 data from *Understanding Society*. The sample has approximately 14,000 households and 22,000 individual interviews. The main determinants of social participation are evaluated using statistical techniques that combine confirmatory factor analysis (CFA) and regression analysis. The CFA expresses the dimensions of participation as latent (not directly measured) concepts defined in terms of directly observed indicators. The effect of seven independent variables (income, sex, region of residence, education, age, ethnic background, and family composition) on these participation dimensions is simultaneously measured through a series of regressions (Table 1).

Table 1 Regression of participation dimensions on demographic and socio-economic characteristics

	Neighbouring	General trust	Interest in politics	Material	Social	Environment
Income (log)	0.02** (0.01)	0.10*** (0.01)	0.07*** (0.01)	0.37*** (0.01)	0.43*** (0.01)	0.10*** (0.02)
Education (postgraduate omitted)						
Lower education	0.07*** (0.03)	-0.44*** (0.04)	-0.42*** (0.03)	-0.16*** (0.03)	-0.36*** (0.03)	-0.24*** (0.06)
GCSE and equivalents	0.04** (0.03)	-0.34*** (0.04)	-0.31*** (0.04)	-0.01 (0.03)	-0.17*** (0.03)	-0.12*** (0.05)
A-Level and equivalents	0.00 (0.03)	-0.18*** (0.05)	-0.14*** (0.04)	-0.00 (0.03)	-0.08*** (0.03)	-0.10*** (0.06)
Nursing, teaching qual. (except PGCE)	0.03*** (0.03)	-0.14*** (0.05)	-0.12*** (0.04)	0.02 (0.03)	-0.06*** (0.03)	-0.08*** (0.06)
First degree level	-0.01 (0.03)	-0.04** (0.05)	-0.03** (0.04)	0.01 (0.03)	-0.01 (0.03)	-0.06*** (0.06)
Ethnic background (ethnic minority omitted)						
Ethnic majority	-0.02** (0.03)	0.03** (0.04)	-0.01* (0.04)	0.09*** (0.03)	0.12*** (0.03)	-0.00 (0.06)
Age groups (above 65 omitted)						
Age 16-22	-0.30*** (0.03)	-0.09*** (0.04)	-0.26*** (0.04)	0.12*** (0.03)	-0.28*** (0.03)	-0.01 (0.06)
Age 23-59	-0.29*** (0.02)	-0.15*** (0.03)	-0.26*** (0.03)	0.14*** (0.02)	-0.34*** (0.03)	0.01 (0.05)
Age 50-64	-0.08*** (0.02)	-0.01 (0.03)	-0.07** (0.03)	0.21*** (0.02)	-0.09*** (0.03)	0.03 (0.05)
Sex (Female omitted)						
Male	-0.06*** (0.01)	0.06*** (0.02)	0.18*** (0.01)	0.01 (0.01)	-0.00 (0.01)	0.03* (0.03)
Family characteristics (no children below age 15)						
Any children below age 4	0.02*** (0.02)	-0.04*** (0.03)	-0.03*** (0.03)	0.04*** (0.02)	-0.05*** (0.02)	-0.01 (0.05)
Children aged 4-15	0.11*** (0.02)	0.01 (0.02)	-0.01** (0.02)	0.23*** (0.02)	0.06** (0.02)	0.07*** (0.03)
Region (England omitted)						
Wales	0.04*** (0.03)	-0.00 (0.04)	-0.00 (0.04)	0.00 (0.03)	-0.01 (0.03)	0.03** (0.07)
Scotland	0.01* (0.02)	0.00 (0.03)	-0.00 (0.03)	0.00 (0.02)	-0.03*** (0.03)	-0.02 (0.06)
Northern Ireland	0.08*** (0.02)	0.01* (0.03)	-0.08*** (0.03)		0.01 (0.03)	0.08*** (0.05)
Number of observations	15,185	15,185	15,185	15,185	15,185	15,185

Note: standardised coefficients (standard errors).***p<.01; **p<.05; *p<0.10.

Social participation comprises three dimensions: neighbouring, trust, and interest in politics (see Appendix Figure 1). Neighbouring constitutes a vital component of social participation, especially for people with low mobility and tight networks and has attracted increasing political attention with, for example, community-based programs (such as Sure Start) and the idea of the 'Big Society' aired during the 2010 electoral campaign. Neighbouring is measured with an eight item[6] version of Buckner's Neighbourhood Cohesion Instrument (1988). Sample items include feeling of belonging to the neighbourhood; willingness to ask for advice from someone in the neighbourhood, and willingness to work with others to improve the neighbourhood. The other items are shown in Appendix Figure 1. Each item has a 5-point response scale ranging from disagree strongly to agree strongly.

Trust is a composite of two indicators related to whether most people can be trusted and the extent to which the respondent is prepared to take risks with strangers. The response categories for the first item are 'You cannot be too careful,' 'it depends,' or 'most people can be trusted.' The second item has a 10-point response scale, ranging from avoid taking risks with strangers to being fully prepared to take risks with strangers. Although trust does not directly measure participation, it has long been used in the literature as a proxy because of its high correlation with participation in associations.[7]

Interest in politics is directly measured on a 4-point response scale, ranging from not at all interested to very interested. It has also traditionally been used to measure social participation in social capital literature (Putnam et al., 1993, Van Oorschot & Art, 2005).

The latent concepts of material and social consumption are based on the possession of, or ability to afford, certain goods and services (see Appendix Figure 2). Material consumption is measured by the possession of eight items: a DVD player, a satellite dish, a dryer, a dishwasher, a microwave, a PC, a CD player and a mobile phone. Social consumption is assessed through the ability to afford holidays, to have friends and family for meals and drinks and to purchase household insurance. These social consumption items are often used as measures of deprivation. These material and consumption items are reported as present or absent.

Analysts focusing on deprivation often distinguish whether a lack is due to choice or the inability to afford the item. By contrast, in this application which views the items as indicators of social consumption, we are only interested in whether a person has the particular experience or service, irrespective of the reason. There is also evidence (Bourdieu, 1984) to suggest that some people will say that they do not possess items through choice, to stave off the embarrassment of admitting that they cannot afford them.

Environmental consumption is based on the willingness to purchase, or consider purchasing, four 'green' products or arrangements. They are: installing a solar panel, solar water heating, selecting a green tariff payment scheme, or a wind turbine to generate electricity. The response categories correspond to already adopted, seriously considering, not considering, and considered but rejected.

Four of the independent variables included in the regression models as predictors of participation have been widely used in previous studies (Guest & Wierzbicki, 1999): household income, gender (male), education and age. The income variable has a log transformation to reduce the effects of heavy skewness. Educational attainment has six categories: none of the above; standard/ordinary (O) grade, lower (in Scotland), CSE, GCSE/O level; certificate of sixth year studies, higher grade, advanced higher (in Scotland), AS level, International Baccalaureate, A level, other schools, leaving exam certificate and other schools; nursing or other medical qualifications, teaching qualification (except PGCE), diploma in higher education; first degree level qualification including Postgraduate education is the omitted category for the set of dummy variables. Age is segmented in four categories: between 16 and 23, between 24 and 49, between 50 and 64, and above 65. The oldest age category is the omitted variable.

Social participation comprises three dimensions: neighbouring, trust, and interest in politics

Region of residence, ethnic background and family composition were also included in the predictive model. We also examined potential variation among the four nations of the Union (Wales, Scotland, Northern Ireland and England). The initial data release did not include the ethnic minority boost sample component. Hence, we are making use of the simple distinction between ethnic majority and ethnic minority (Levie, 2007; Ram & Smallbone, 2002), with ethnic minority status coded 1.[8] Majority group status includes British, English, Scottish, Welsh, Northern Irish, Irish, any other white background. Minority status includes Indian, Pakistani, Bangladeshi, Chinese, any other Asian background, Caribbean, African, any other black background, Arabs, any other ethnic groups, and other mixed background. When data from the ethnic minority boost sample has been released, it will be possible to compare and contrast experiences among several of the major ethnic groups. Finally, family structure is captured simply[9] by reference to the presence of dependent children within a household (with distinctions made between families with any children below the age of 4, those with children aged between 4 and 15, and childless families).

[6] Eight items out of 39 of the original scale.

[7] As participation in associations. General trust is also one of the components of social capital (Paxton, 1999, Knack and Keefer, 1997, Van Oorschot and Arts, 2005).

[8] This is because the sample size does not allow at the moment to provide more detail. This simplification has been used after the works of Levie, (2007) and Ram and Smallbone (2002).

[9] This variable provides a simplified estimate of the impact of different family compositions on participation. The first full annual release of *Understanding Society* will allow control for a more refined categorisation of household configurations.

Table 2 Correlation Matrix Participation Dimensions

	Neighbouring	General trust	Politics	Material	Social	Environment
Neighbouring	1					
General Trust	0.22***	1				
Politics	0.02**	0.15***	1			
Material	0.03***	0.06***	0.05***	1		
Social	0.10***	0.11***	0.08***	0.44***	1	
Environment	0.08***	0.05***	0.09***	-0.05**	0.03	1

***p<.01; **p<.05; *p<0.10.

PRELIMINARY FINDINGS

Five of the six dimensions selected to measure social participation (Table 2), co-vary such that a high score on one is likely to be associated with a high score on another. This suggests the possibility that the benefits on participation are mutually reinforcing. Social consumption is not associated with environmental consumption.

Table 1 summarises the associations between individuals' demographic and socio-economic characteristics and the dimensions of participation. Income is positively associated with each dimension of participation. The largest relationships with income are for social and material goods consumption. However, while social consumption and consumption of material goods increases as income rises, income explains no more than a fifth of the variance in either dimension of participation. Again, this is understandable given that several of the material goods that feature in the scale might be considered necessary for everybody rather than being discretionary.

Adults living with school aged children tend to have higher levels of material and social consumption than other groups

Education appears to be more important than income for each dimension of participation except material consumption. People with degree level education are notably more likely than other people to score highly on the measures of trust, social expenditure and political interest and they are also more ready to invest in energy saving measures in support of the environment. People without qualifications (or with very modest ones) typically have correspondingly low scores on all these dimensions. Indeed, insofar as participation is concerned, three different societies appear to exist, demarcated by the possession of a degree associated with much higher than average engagement, and qualifications at or below GCSE level that typically signify much below average participation.

Differences in participation relating to ethnicity are small and will need to be examined again when the full *Understanding Society* data become available. However, consistent with the findings of Demack and associates (2010), material and social consumption and trust are lower among minority groups, but neighbouring and political interest are higher.

Age is also associated with participation. People in their immediate pre-retirement years tend to purchase more material goods, possibly in preparation for retirement and because their incomes are high relative to other periods in their lives. In contrast, social consumption is highest among pensioners, arguably because they have more time to socialise and holiday if they can afford to do so. Neighbouring is positively related to age, increasing noticeably among people aged 50 and older.

Women are a little more likely than men to identify and engage with their neighbourhoods, a finding echoing down from community studies conducted in the 1950s and 1960s (Young & Willmott, 1957; Coates & Silburn, 1970). On the other hand, men are apt to exhibit higher levels of trust than women and to be more interested in politics – both indicators of formal social participation.

Adults living with school aged children tend to have higher levels of material and social consumption than other groups. Consumption is high, perhaps a reflection of children's demand for the latest IT equipment and parents' view that time saving equipment is necessary to facilitate a more conducive work-life balance. From a social point of view, those in families with school aged children are more involved in their own neighbourhoods. Respondents with pre-school children showed similar tendencies to those with older children but to a lesser extent; they also had lower scores on social expenditure, possibly because parenting duties kept them at home, and slightly lower levels of trust.

In terms of regional differences, English respondents tend to have the lowest neighbouring scores, while Welsh respondents reported the highest ones; Scottish respondents have below average scores on social expenditure and respondents from Northern Ireland have

the highest scores on trust and the least interest in politics, possible lasting legacies of the troubles as suggested by Wright (1988).

DISCUSSION AND CONCLUSION

Participation is not only the glue that holds society together. Participation is a source of personal identity and social standing. It is the mechanism through which mutual support and social cohesion is created and civic identity established. This multi-dimensional view of participation suggests that it also generates structures that allow the well connected to prosper while excluding others, perhaps even trapping some outside the reach of a supportive society. Over time, *Understanding Society* will provide evidence through which to measure the development and scope of social participation and thus to monitor the health of British society.

The first data available from *Understanding Society* provide a tantalising glimpse of social participation in British society. It has proved possible to identify six distinct dimensions: three based around consumption, material, social and environmental; and three related to social participation: neighbouring, trust and political interest. As further data are generated, the measurement of these dimensions will be much improved and others may be added.[10] For example, in Wave 2, there will be indicators of participation in associations and of voluntary work. Perhaps not surprisingly, the strongest positive correlations are between material consumption and social consumption, and between neighbouring and generalised trust. Material and social consumption both demand financial resources to sustain them and hence are, in large measure, denied to people on low incomes. In an era of financial austerity, the gap between the 'haves' and the 'have-nots' may increase unless policy is deliberately progressive. The association between trust and neighbouring, which echoes conclusions from the literature on social capital (Putnam, et al., 1993, Van Oorschot & Art, 2005), would suggest a bi-directional (recursive) causal process, by which trust facilitates social contact which, in turn, helps to increase trust, a process that can in future be modelled as panel data from *Understanding Society* become available. Somewhat at odds with this idea, the existing data hint that levels of trust may be lower among minority ethnic communities, but that neighbouring might be marginally higher; this is a potentially important finding that should be further investigated when detailed information from *Understanding Society*'s ethnic minority boost sample becomes available in a year's time. Indeed, neighbouring (including the sense of local identity) is confirmed as the only dimension in which society's less advantaged members – ethnic minorities, women, and those with no or elementary educational qualifications – score more highly than other groups (see also Guest & Wierzbki, 1999). However, even the highest score on neighbouring does not compensate for the large shortfalls in participation these groups experience on the other five dimensions.

The only two dimensions that appear not to be positively correlated are material and environmental consumption (Table 2). It therefore appears that, in Britain, the propensity of people to invest in environmental goods is actually negatively correlated to their propensity to consume material goods. This suggests the possibility of an explicit and conscious trade-off, as those who are most concerned about environment issues choose not to acquire material assets, many of which, such as dishwashers and driers, consume large amounts of water and energy. It should be stressed, however, that this relationship is weak and it will be important to establish whether the negative correlation intensifies in the years ahead with a possible rise in environmental consciousness and a progressive reduction of a materialistic culture. Currently, environmental consumption is particularly low among people with the least education, while those with post graduate education are, on average, the most committed to pro-environment spending. It will be useful to explore willingness to buy environmentally relevant goods in relation to income and household characteristics.

The statistical modelling revealed the importance of age on social participation. People over retirement age are more likely than younger people to engage in all forms of participation, except material consumption, even when controlling for income, gender, education, ethnic background and regional residence. There are several possible explanations for this finding, including the amount of uncommitted time available to pensioners, a greater propensity to be at home that might foster stronger neighbourhood networks and mutual support, and finally, generational change in social aspirations and socialising behaviours. The first two possibilities will be explored through adding new controls into the models as data become available.

It will also be of interest to examine the effects of age in a longitudinal context. It will be of interest to apply Hall's (1999) analysis of social participation as it extends to this multidimensional view of participation that includes consumption. Hall argued that each new generation in the United Kingdom has had lower social capital than previous age cohorts, but that this decline has been mitigated by higher levels of education (our results confirm the positive relation between educational attainment and participation), the emergence of a large middle class (with the high income and educational attainment that foster the accumulation of social capital), and governmental policy that has increasingly supported growth in the voluntary sector. Longitudinal data from *Understanding Society* should eventually enable us to determine whether Hall's (1999) generational hypothesis is correct, or whether participation increases as a consequence of changes in lifestyle contingent on retirement. The first hypothesis suggests social bonds are in terminal decay, with negative effects for society as a whole, while the latter might indicate increased social participation arising from an aging society.

[10] Participation in associations and voluntary work indicators are included in the next wave of *Understanding Society*.

Finally, as one might expect in a society with a strong individualistic tradition and an increasingly strong emphasis on consumption and consumerism as bases for social identity (Giddens, 1991; Slater, 1997; Featherstone, 2007), most dimensions of participation were found to be quite strongly related to income (Auslander & Litwin, 1988; Menchik & Weisbrod, 1987; Walker, 2008). However, education also matters, even when, as in the modelling, account is taken of higher incomes commanded by people with better education. While material consumption is significantly lower than average only among those without qualifications, the level of involvement in all other forms of participation closely follows the contours of educational achievement. In some respects, this finding comes as no surprise, since education is a principal mechanism through which citizens are equipped adequately to participate in society and is the vehicle advocated by generations of politicians to address the causes of social disadvantage. On the other hand, the fact that the relationships are so strong, even after account is taken of the economic benefits accruing from education, seems to underline the intrinsic rather than the instrumental value of good schooling. However, it is important in further analysis to determine whether the association between social participation and education is a direct result of good educational experiences or simply a product of the all pervasive influence of social class.

Sample Size

Individuals aged 16 and above who completed the adult individual interview and had complete data for the variables in the model. The final sample size is 15,185.

Findings

The authors define participation as a multidimensional concept combining social participation and consumption, since the inability to afford a certain level of consumption excludes people from full participation in today's society. Five of the dimensions are related to one another. These are neighbouring, trust, and interest in politics, traditional measures of participation, and material and social consumption. A measure of environmental consumption, willingness to adopt environmental arrangements or products, was less strongly related to other participation dimensions.

There are strong associations between income and education. Income is positively associated with each dimension of participation, with the largest associations being for social and material goods consumption. People with degree level education are notably more likely than other people to score highly on the measures of trust, social expenditure and political interest.

Gender and family stage also are related to participation. Women are more likely than men to identify and engage with their neighbourhoods, while men are report higher levels of trust and interest in politics than women – both indicators of formal participation. The presence of children in the household is associated with higher material and social consumption and greater involvement in neighbouring.

APPENDIX: STATISTICAL MODELING OF PARTICIPATION

This Appendix presents some details of the statistical modeling done for this chapter. Table A lists several of the fit indices produced for the MIMIC model. Three categories of fit measures are shown. The chi-square test assesses the model fit in an absolute way. The comparative fit measures compare the model to a more restricted, nested baseline model. Typically, this baseline model is a 'null' model or model of 'independence,' in which the covariances among all input indicators are fixed to zero, although no such constraints are placed on the indicator variances. It is desirable for the CFI and TLI to be greater than 0.95. The root mean square error of approximation (RMSEA) is an 'error of approximation' index because it assesses the extent to which a model fits reasonably well in the population (Brown, 2006, p. 81-86). It is considered good for the RMSEA to be less than 0.06.

In addition, the Appendix shows the results of the measurement portion of the model. Figure A shows the results for the social participation dimensions. The coefficients on the arrows linking the latent constructs, e.g. Neighbouring are like factor loadings for each observed indicator. Figure B shows the results of the measurement portion of the model that is related to the consumption dimensions.

Table A CFA Fit Statistics (N=15,185)

Absolute Predictive Fit	
Chi-Square	656,799.44 298 degrees of freedom
Comparative Fit	
Comparative Fit Index (CFI)	0.95
Tucker Lewis Index (TLI)	0.96
Parsimony Fit	
Root Mean Square Error of Approximation (RMSEA)	0.04

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Education and income are associated with each dimension of participation

Figure 1 Social Participation Dimensions

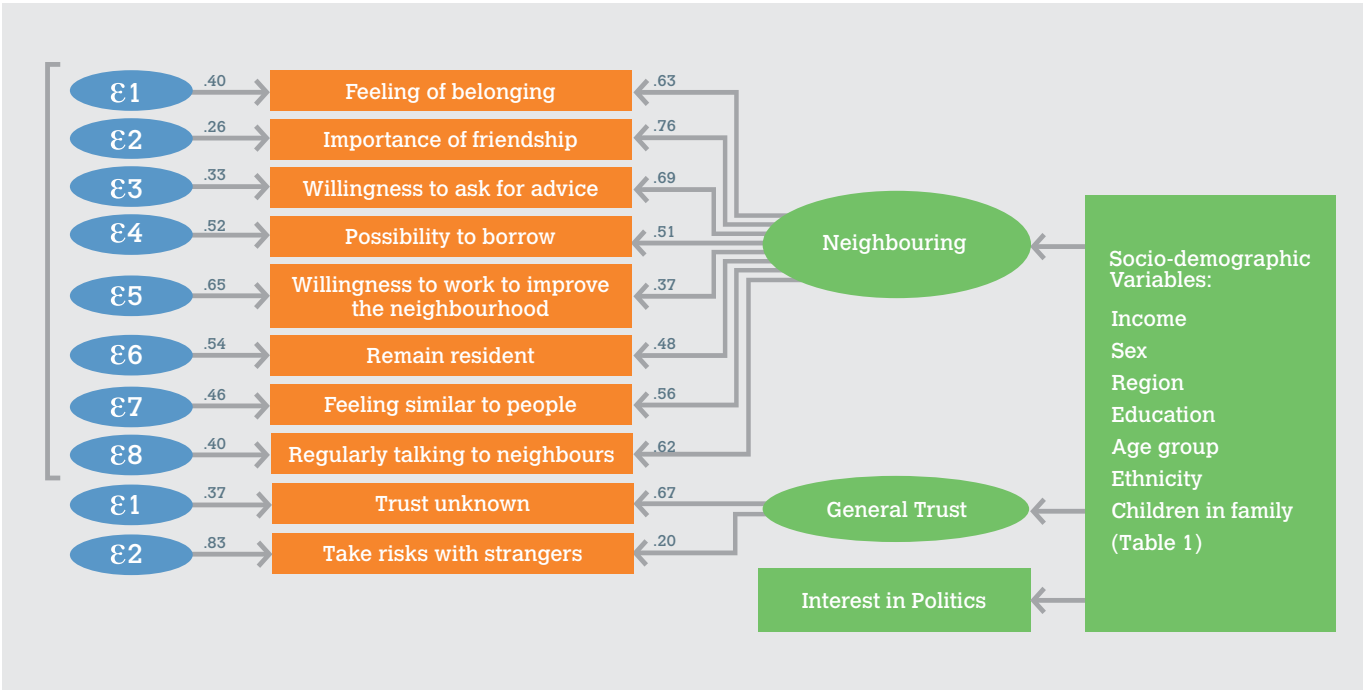
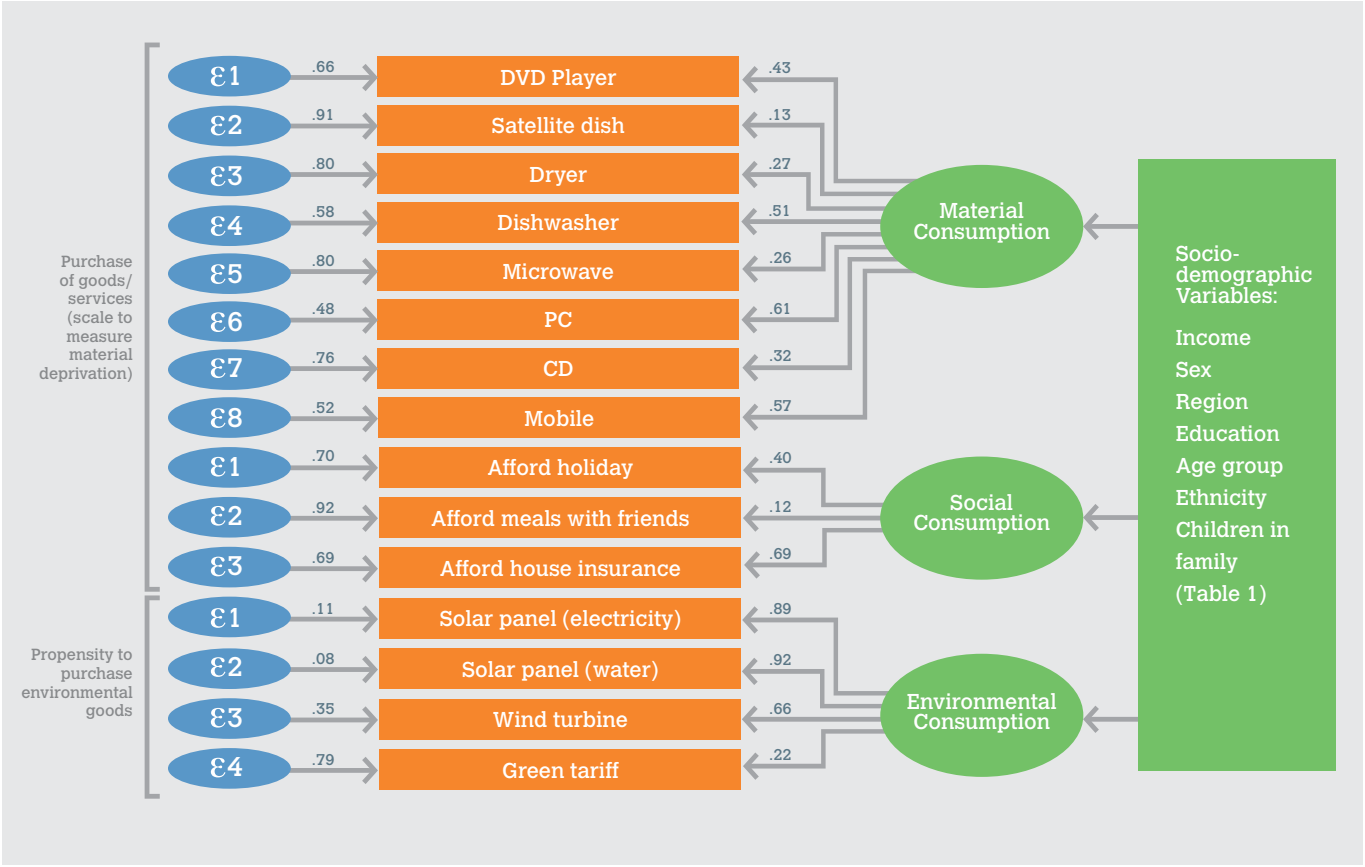


Figure 2 Consumption Dimensions



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HEALTH OVER THE LIFE COURSE: ASSOCIATIONS BETWEEN AGE, EMPLOYMENT STATUS AND WELL-BEING

Cara L. Booker | Amanda Sacker

INTRODUCTION

Understanding Society includes a health module with questions on general self-rated health, height and weight, long-term and limiting long-term illness, health conditions and psychological well-being. This chapter provides an overview of these measures and describes the health characteristics of the *Understanding Society* sample. The relationship between the different health measures is outlined and some socio-demographic health patterns are discussed. The potential impacts of proposed changes to retirement age policy on health are also explored. The chapter ends with a description of measures to be included in future waves of *Understanding Society* and their anticipated contributions to research.

The population of the UK is changing, increasing as well as getting older (Office for National Statistics, 2009). These changes also mean a change in the health profile of the country. *Understanding Society* allows us to follow a sample of the UK population as they get older, change their health-related behaviours and experience different health issues. There are several advantages of *Understanding Society*: the study allows for longitudinal analyses and a life course approach to health; the household design of the study links family members for investigations of health status and behaviours across relationships and generations; the wide scope of *Understanding Society* allows for the inclusion of household and individual factors in the exploration of health inequalities; finally, *Understanding Society* is collecting biomarkers and will be linked to several sources of medical data, widening the scope of questions that can be answered.

MEASURES

Several aspects of health are measured in the first wave of the adult interview. Self-rated health (SRH), health functioning, long-term (LTI) and limiting long-term illness (LLTI) and health conditions are included in the main questionnaire and psychological well-being measures are assessed in the self-completion questionnaire.

SELF-RATED HEALTH

The 12-item Short Form Health Survey (SF-12) is used to measure self-rated general health as well as physical and mental functioning (Ware, Kosinski, Turner-Bowker & Gandek, 2001). The physical component (PCS) and mental component (MCS) scales are normalised, to the 1998 United States population, to have a mean of 50 and a standard deviation of 10. Self-rated general health (SRH) is an individual question in the SF-12 and is included in the calculation of both the PCS and the MCS scales.

LONG-TERM/LIMITING LONG-TERM ILLNESS AND TYPE OF IMPAIRMENT

A question asks whether participants had a long-term illness (LTI), defined as 'a long-standing physical or mental impairment, illness or disability... that has troubled you over a period of at least 12 months or that is likely to trouble you over a period of at least 12 months'. The wording of this question differs from that in the BHPS and now matches more closely the wording in the British Census (Office for National Statistics, 2010).

The type of limitation or impairment was ascertained from those who reported having a LTI. Participants were asked about 12 different types: mobility, lifting, manual dexterity, continence, hearing, sight, communication and speech, memory/concentration, recognition of physical danger, co-ordination, personal care and other.

Anyone who answered affirmatively to the previous question is considered to have a limiting long-term illness (LLTI). Many studies have explored the relationship between LLTI and various other health and social indicators including health functioning, social class, SRH and mortality.

HEALTH CONDITIONS

Participants were asked about diagnoses by a doctor or health professional. Seventeen conditions were listed, including asthma, arthritis, diabetes, clinical depression and heart attack. The conditions included match those asked in the National Health and Nutrition Examination Survey, conducted in the United States (Centers for Disease Control and Prevention, 2010). The age at which they were first diagnosed and whether they still had the health condition were also asked.

PSYCHOLOGICAL WELL-BEING AND DISTRESS

The Warwick-Edinburgh Mental Well-being Scale (WEMWBS) (Tennant et al., 2007) is a new measure of positive psychological well-being. *Understanding Society* includes the 7-item Short version (SWEMWBS) (Stewart-Brown, Tennant, Tennant, Platt, Parkinson & Weich, 2009) in the self-completion questionnaire. Each item is scored on a 5-point response scale, from none of the time to all of the time, and summed to give a total score, ranging from 7 to 35. Higher scores indicate higher levels of well-being. The authors suggest that people over one standard deviation

(SD) above the mean can be classified as having 'above average' psychological well-being, those within one SD of the mean are 'average' and those below one SD of the mean have 'below average' well-being (Davidson, Sewel, Tse, Ipsos MORI & O'Connor, 2009; National Health Service Health Scotland, 2009). Standard deviation is the most commonly used measure of spread of scores around the average.

The General Health Questionnaire-12 (GHQ-12) is included as a measure of psychological distress (Goldberg & Williams, 1988; Goldberg et al., 1997). A sample item is, 'Have you recently been able to concentrate on whatever you're doing?' with response categories of 'better than usual', 'same as usual', 'less than usual', or 'much less than usual'. Two scoring methods are recommended. One scoring method sums the responses to the 12 items, applying scores from 0 to 3. The summed score can range from 0 to 36. The other method is a categorical measure of distress or 'caseness'. In this approach, items contribute to the summed measure as 1 if the response is 'less than usual' or 'much less than usual'. The range is from 0 to 12. A cut point of four is applied to indicate the presence of psychiatric morbidity (Goldberg & Williams, 1991). In both scoring schemes a higher score indicates higher levels of psychological distress.

ANALYSES

All proportions provided in tables and figures use the design weights; the numbers provided are raw (unweighted) numbers. The design weights adjust for unequal probability of selection at the sample design stage. They vary for multiple dwellings and households and for the sample design in Northern Ireland. Age and gender were centred by subtracting the average or mean and included in the analysis to obtain the means and 95% confidence intervals (CIs) for physical and mental functioning. These age and gender standardised PCS and MCS means reflect the effect of different characteristics on a gender neutral, 50-year-old individual.

RESULTS

SELF-RATED HEALTH

Self-rated health is one of the most common ways to measure health status in general population surveys, being a strong predictor of mortality in many studies (Ford, Spallek & Dobson, 2007; Idler & Angle, 1990; Kaplan & Camacho, 1983; Mossey & Shapiro, 1982; Wannamethee & Shaper, 1991).

Table 1 shows the breakdown of SRH by gender in this sample. In contrast to earlier surveys, there are no differences between males and females, with 50% rating their health as either 'excellent' or 'very good'.

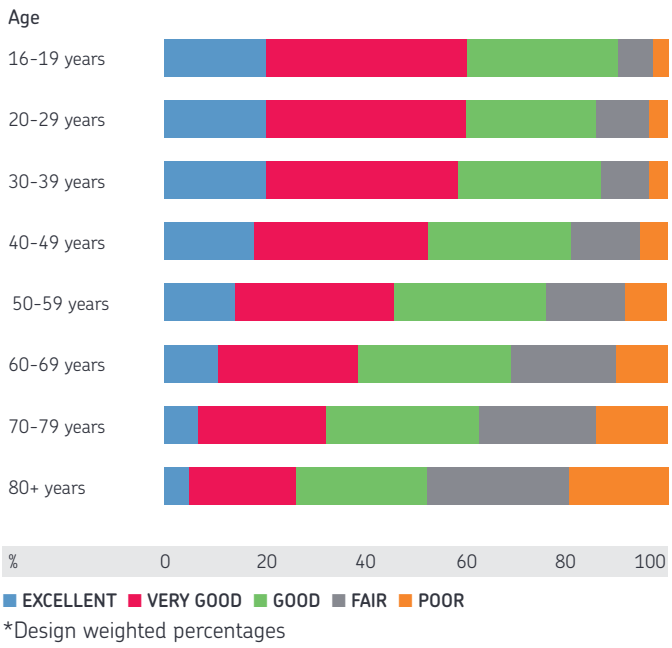
While men and women had similar SRH, it does differ by age (see Figure 1). The prevalence of 'fair' or 'poor' SRH increased slowly from 10% in the youngest age group to 14% for individuals in their 30s. Thereafter, poor health became increasingly more common, with over 30% of those 60+ and approaching 50% in the oldest age group rating their health as 'fair' or 'poor'.

Table 1 Self-rated health by gender

Self-rated Health	Male	Female
	%*	%*
Excellent	18	17
Very Good	32	33
Good	29	28
Fair	15	15
Poor	7	7
Total (n)+	9,699	12,554

*Design weighted percentages
+Unweighted raw number

Figure 1 Self-rated health by age group



*Design weighted percentages

Self-rated health by country is provided in Table 2. Over 50% of participants in Scotland and Northern Ireland rated their health as 'excellent' or 'very good', while less than 50% in England and Wales rated their health as such. About one quarter of participants rated their health as 'fair' or 'poor' across all countries.

Table 3 shows the percentage of males and females in the sample who have a LTI and the types of limitations that some experience

LONG-TERM/LIMITING LONG-TERM ILLNESS

Table 3 shows the percentage of males and females in the sample who have a LTI and the types of limitations that some experience. A similar percentage of males, 37%, and females, 38%, have a LTI, of these 68% of males and 71% of females reported limitations in the last month. Climbing stairs and the amount and kinds of work one could do were the most common limitations, with women tending to report recent limitations more than men.

Rates of long-term and limiting long-term illness by country are provided in Table 4. A greater proportion of respondents have non-limiting long-term illness in England (12%) and Scotland (11%), than in Wales (9%) and Northern Ireland (7%). Similar percentages of participants have limiting long-term illness across the four countries (25-30%).

Table 2 Self-rated health by country

Self-rated Health	England %*	Wales %*	Scotland %*	Northern Ireland %*
Excellent	17	17	20	21
Very Good	32	29	33	31
Good	29	29	25	24
Fair	15	18	14	16
Poor	7	8	7	8
Total (n)+	17,308	1,142	1,810	1,994

*Design weighted percentages
+Unweighted raw number

Table 3 Prevalence of long-term impairment, illness or disability by type of limitation and gender

Long-standing Illness	Male		Female	
	%*	N+	%*	N+
Long-term illness	37	3,536	38	4,732
Limiting long-term illness	25	2,408	27	3,389
Limitations in the last 4 weeks				
Typical activities	14	1,420	18	2,241
Climbing stairs	16	1,588	21	2,665
Amount of work	21	2,060	25	3,156
Kinds of work	20	1,950	24	3,021
Social interactions	16	1,523	19	2,356

*Design weighted percentages of total sample
+Unweighted raw number

Table 4 Prevalence of long-term impairment, illness or disability by country

	England		Wales		Scotland		Northern Ireland	
Long-standing Illness	%*	N+	%*	N+	%*	N+	%*	N+
No long-term illness	63	10,878	62	711	58	1,060	66	1,322
Non-limiting long-term illness	12	2,023	9	104	11	204	7	140
Limiting long-term illness	25	4,397	28	324	30	544	27	529

*Design weighted percentages of total sample
+Unweighted raw number

Table 5 Limiting Illness by employment status and age group

	Working Age				Over Retirement Age		
Limiting Illness	**Employed %***	**Unemployed %***	**Inactive %***	**Total (n)+**	**Employed %***	**Inactive %***	**Total (n)+**
No long-term illness	72	7	21	11,765	16	84	2,200
Non-limiting long-term illness	76	6	18	1,784	18	82	680
Limiting long-term illness	49	10	42	3,337	6	94	2,454

*Design weighted percentages
+Unweighted raw number

Table 6 Number of impairments by employment status and age group

	Working Age				Over Retirement Age		
Number of Impairments	**Employed (%)***	**Unemployed (%)***	**Inactive (%)***	**Total (n)+**	**Employed (%)***	**Inactive (%)***	**Total (n)+**
One	71	8	22	3,182	15	85	1,353
Two or more	37	9	53	1,935	4	96	1,785
Total (n)+	2,942	425	1,750	5,117	270	2,868	3,138

*Design weighted percentages
+Unweighted raw number

Table 7 Impairments by age group

	Working Age		Over Retirement Age	
Type of Impairment	**%***	**N+**	**%***	**N+**
Lifting, carrying or moving objects	37	1,942	53	1,696
Mobility	29	1,534	47	1,508
Other health problems	17	877	14	442
Memory or concentration problems	15	762	14	434
Manual dexterity	12	640	21	672
Physical coordination	12	595	18	557
Personal care	9	456	14	433
Continence	7	385	14	432
Hearing	6	315	17	523
Sight	6	310	13	401
Communication problems	4	198	2	69
Recognising physical danger	2	127	2	64
None of these	36	1,785	22	686

*Design weighted percentages
+Unweighted raw number

Table 8 Health conditions

	Ever diagnosed		Still have	
Health condition	**% of study population***	**N+**	**% of ever diagnosed***	**N+**
High blood pressure	19	4,269	78	3,326
Arthritis	15	3,428	97	3,338
Asthma	13	2,936	74	2,171
Clinical depression	7	1,537	69	1,070
Diabetes	6	1,249	96	1,195
Cancer	4	837	29	245
Angina	3	717	80	575
Hypothyroidism	3	660	96	630
Coronary heart disease	2	450	84	377
Heart attack/MI	2	525	–	–
Stroke	2	431	–	–
Chronic bronchitis	2	458	56	258
Congestive heart failure	1	134	79	106
Emphysema	1	162	93	149
Hyperthyroidism	1	209	55	116
Liver conditions	1	290	65	183
Epilepsy	1	263	64	168

*Design weighted percentages
+Unweighted raw number

The presence of a LLTI may have implications for employment. Table 5 shows that among those of working age, (16-59 for females, 16-64 for males) participants who had a non-limiting LTI were just as likely to be employed as those without a LTI. By contrast, those with a LLTI were twice as likely to be inactive *and* about one third more likely to be unemployed than those with no illness or no limitations.

Table 5 also provides these statistics for those over the current retirement age (60 or older for females, 65 years or older for males). Similar to the working aged, participants with a LLTI were much more likely to be inactive compared to those with no illness or a non-limiting illness.

EMPLOYMENT AND IMPAIRMENTS

The economic crisis of 2008-2010, along with increased life expectancy, has caused the UK government to consider a change in the current timetable in which the State Pension age will reach 66 (State Pension Age Review Team, 2010). The proposed changes would mean that the pension age of 66 would come 6-8 years earlier than proposed. This, in turn, could pull forward the implementation date for extending the pension age to 68. Recent commentary has proposed that it may be more cost-efficient to increase the retirement age to 70 for all adults (Elliot, 2010; Hawksworth, Dodson & Jones, 2010). We examine the health profiles of those over the current retirement age and under 70 years. Among those potentially affected, around 28% with no LTI or with no limitations were in employment while only 13% with LLTI were employed. Of the inactive participants who would no longer be over retirement age, 43% had a LLTI. This suggests that while the majority of those who are currently retired could be gainfully employed, there would still be a large minority of people unable to work.

Table 6 provides more insight by showing the effect of co-existing impairments (2 or more impairments), on participation in employment. Among those of working age, 71% of those with a single impairment were employed, while only 37% of those with two or more were in work. Comparing these figures with those in Table 5 suggests that it is impairments in multiple domains that force individuals to leave the labour market. Since co-existing impairments are far more common in those over 60, the economic returns to raising the retirement age may be smaller than hoped.

The specific types of impairments and the prevalence of each are shown in Table 7. Mobility and lifting objects were the most common in older and younger adults and unsurprisingly, participants over retirement age had a higher percentage of manual dexterity, continence, hearing and sight, physical coordination and personal care problems than those of working age. The very high rates of mobility and lifting problems among the older age group again point to their likely inability to stay in work requiring physical strength and dexterity beyond the current retirement age.

HEALTH CONDITIONS

The prevalence of chronic health conditions in the population can predict overall health, potential health care usage and costs and mortality. Table 8 provides a list of chronic conditions and the number of participants who report having been diagnosed with each condition and whether they still have it. Asthma, arthritis and high blood pressure are the three most prevalent conditions, each affecting over 10% of the sample. With the exception of cancer, hyperthyroidism and chronic bronchitis, over 60% of participants who received a diagnosis still had the condition.

The association of limitations with each health condition indicates the extent to which each may put a strain on the health service and benefits systems. Table 9 shows the proportion limited by each health condition. Rare conditions like congestive heart failure and emphysema had the highest percentage of participants with limitations, while common conditions such as asthma and high blood pressure had the lowest. However, in absolute terms, over 10 times as many people were limited by these latter conditions than by the former.

Table 9 Limitations by current health condition

Health Condition	Percent Limited by Illness*	Total N with Condition+
Congestive heart failure	92	106
Emphysema	88	149
Coronary heart disease	79	337
Angina	79	575
Chronic bronchitis	79	258
Cancer	74	245
Clinical depression	71	1,071
Liver conditions	69	183
Arthritis	66	3,338
Diabetes	65	1,195
Epilepsy	64	168
Hyperthyroidism	60	116
High blood pressure	54	3,326
Hypothyroidism	50	630
Asthma	44	2,171

*Design weighted percentages
+Unweighted raw number

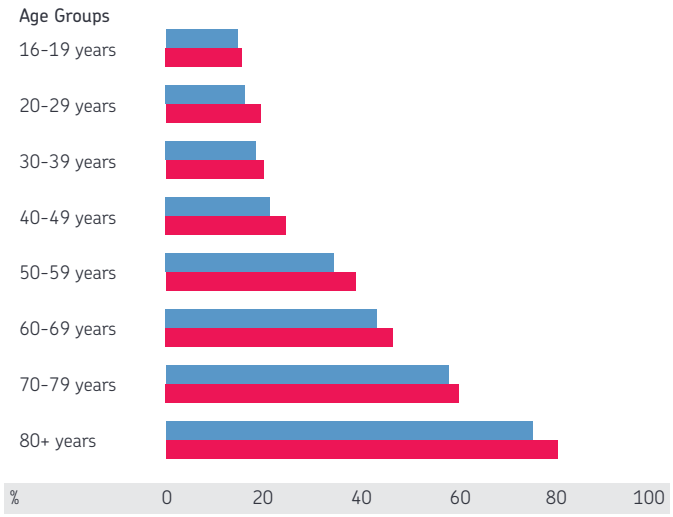
HEALTH FUNCTIONING

Figures 3 and 4 show the percentage of participants in the lowest third of the distribution, i.e. the poorest, for physical and mental health functioning, across age groups for males and females.

Figure 3 shows that PCS declines ever faster with age. Only 15% of the youngest group has poor physical functioning compared with around 80% in the group aged 80+. MCS (Figure 4) shows a different trend with an increase in lowest third through to ages 40-49 and then a decrease until ages 70-79. Those aged 80+ have a slightly higher percentage of people with low MCS functioning than those aged 70-79. Females have higher percentages in the lowest third for both PCS and MCS. Gender differences are more pronounced for mental functioning than for physical functioning.

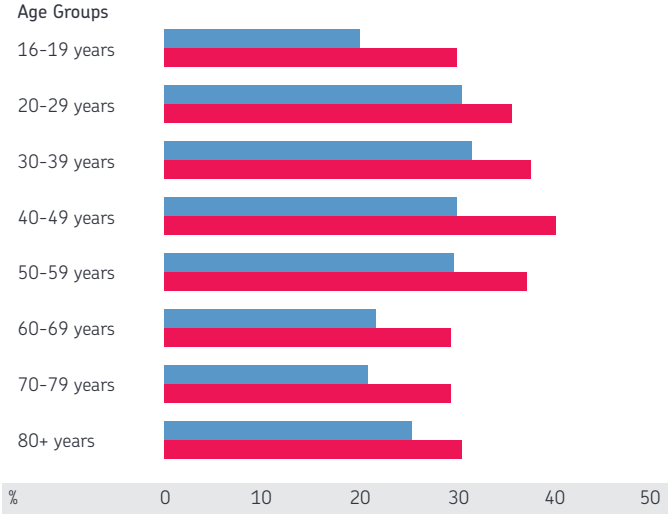
The effect of non-limiting and limiting illness on health functioning is shown in Table 10. Participants with no LTI have the highest mean PCS and MCS, while those with LTI have significantly lower mean scores. The magnitude of the differences is small for those with non-limiting illness but substantial for those with LLTI, amounting to 1.5 standard deviates (SD) for PCS and 0.6 SD for MCS.

Figure 3 Physical Health function scores – lowest third by age group and gender



*Design weighted percentages

Figure 4 Mental Health function scores – lowest third by age group and gender



*Design weighted percentages

Table 10 Health functioning by limiting illness

	Physical (PCS)		Mental (MCS)	
Limiting illness*	**Mean**	**95% CI**	**Mean**	**95% CI**
No long-term illness	53.33	(53.18, 53.49)	52.36	(52.30, 52.64)
Long-term illness	51.56	(51.21, 51.92)	50.75	(50.36, 51.14)
Limiting long-term illness	38.47	(38.22, 38.71)	46.52	(46.25, 46.79)

*Means and 95% confidence intervals age and gender standardised

Table 11 Health functioning and health conditions*

	Never diagnosed		Ever diagnosed		Still have	
Health functioning	**Mean**	**95% CI**	**Mean**	**95% CI**	**Mean**	**95% CI**
Physical (PCS)	53.74	(53.69, 53.79)	51.31	(51.18, 51.44)	42.97	(42.91, 43.03)
Mental (MCS)	51.62	(51.59, 51.65)	51.44	(51.36, 51.51)	49.23	(49.20, 49.27)

*Means and 95% confidence intervals age and gender standardised

Table 11 provides PCS and MCS means for participants who have never been diagnosed with any health condition, ever been diagnosed and still have a condition. Participants who had never been diagnosed with a health condition had the highest mean PCS and MCS. Similar to limiting illness, those who no longer had a health condition were only marginally worse off, but those who still had a health condition had much poorer PCS scores. Although the same general trends are seen for mental functioning, the differences in mean MCS were much smaller. These findings suggest that while physical functioning declines with the presence and duration of a health condition, mental functioning is more stable and less affected by chronic health conditions.

Table 12 shows PCS and MCS means for some selected health conditions. These health conditions either have a high prevalence or are one of the leading causes of death in the UK. The respiratory disease category comprises asthma, emphysema and chronic bronchitis; cardiovascular disease includes congestive heart failure, coronary heart disease, angina, heart attack/myocardial infarction and stroke.

For each selected condition, PCS was below the average of 50. Participants who had ever been diagnosed with diabetes and cardiovascular disease had the lowest functioning, while those with clinical depression and respiratory disease had significantly higher functioning, albeit below average. Mental functioning did not show similar patterns, as participants with clinical depression had low MCS, while participants who had ever been diagnosed with cancer, diabetes, respiratory or cardiovascular disease had MCS within the normal range. These findings indicate that low levels of physical functioning do not translate into low levels of mental functioning and that people who have debilitating conditions can be mentally resilient.

Table 12 Health functioning by selected health conditions*

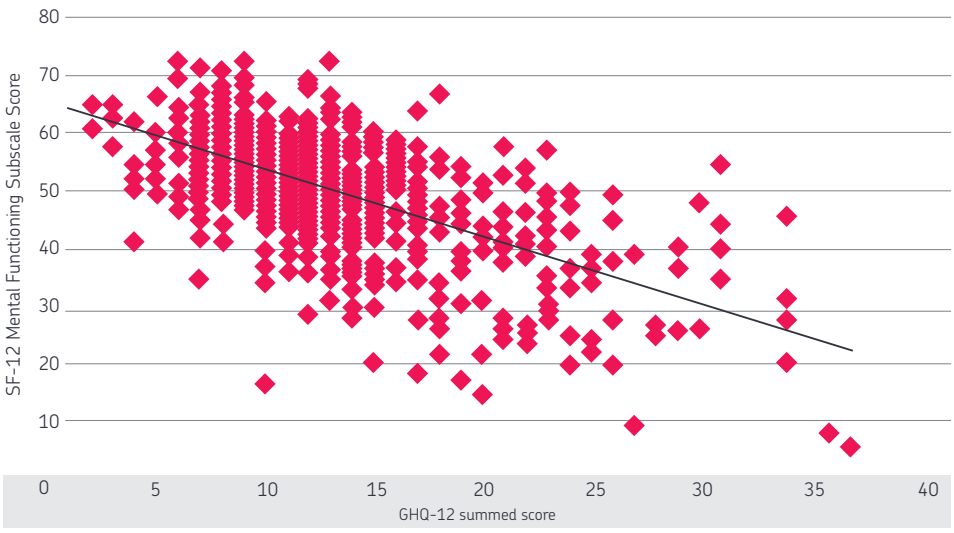
	Physical (PCS)		Mental (MCS)	
Health condition	**Mean**	**95% CI**	**Mean**	**95% CI**
Cancer	40.21	(39.97, 40.45)	50.12	(50.05, 50.20)
Diabetes	38.05	(37.86, 38.24)	49.72	(49.65, 49.78)
Clinical depression	44.44	(44.26, 44.63)	38.46	(38.42, 38.51)
Respiratory disease	45.63	(45.40, 45.85)	49.33	(49.28, 49.37)
Cardiovascular disease	34.47	(34.31, 34.63)	49.11	(48.99, 49.24)

*Means and 95% confidence intervals age and gender standardised

PSYCHOLOGICAL WELL-BEING AND DISTRESS

The SF-12 MCS provides some insight into the mental well-being of *Understanding Society* participants; however two other measures provide more information on the psychological well-being and distress of this sample. The GHQ-12 has been used to screen for minor psychiatric morbidity and has been used in all waves of the BHPS. The mean GHQ-12 summed score was 11.07 (SD = 5.14).[1] These analyses use the design weights. Mean scores did not differ between countries. Figure 5 is a plot of MCS scores with GHQ-12 summed scores for 5% of the sample. It shows clustering around the average of each scale, 50 for MCS and 11 for GHQ-12. As expected, participants with higher levels of mental functioning had lower levels of psychological distress, but there was quite a lot of variation in this relationship.

Figure 5 Mental Functioning (SF-12 MCS) by Psychological Distress (GHQ-12)



Participants with higher mental functioning had less psychological distress, but there was much variation in this relationship

[1] Weighted means and standard deviations

Figure 6 Psychological Well-being (WEMWBS) by GHQ-12

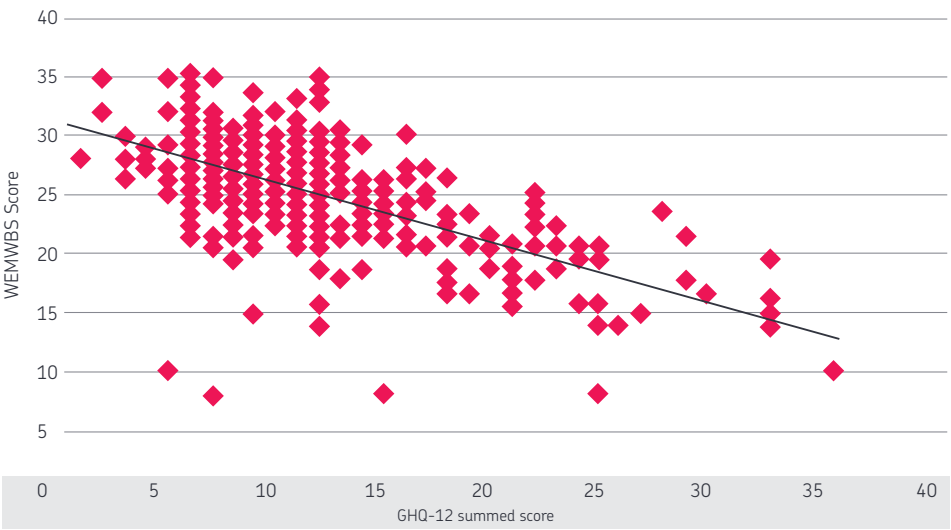
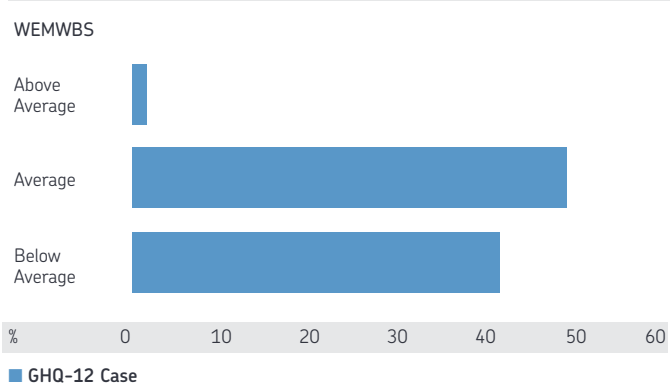


Figure 6 shows that positive well-being as measured by the SWEMWBS is not the opposite of psychological distress

The WEMWBS has been shown to have a significant and negative correlation with the GHQ-12 of -0.53 (Tennant et al., 2007). In this sample, the mean SWEMWBS score was 25.3 (SD = 4.4)[2] and there was also a negative correlation of the new SWEMWBS and GHQ-12 summed scoring of -0.56. Figure 6 plots SWEMWBS scores with the GHQ-12 scores for the 5% sample. Similar to Figure 5, there is a clustering of subjects around the average of each scale with participants having higher levels of psychological well-being also having lower levels of psychological distress. The variability around the regression line in the figure confirms the relatively low correlation between the two scales.

The GHQ-12 can be scored to identify minor psychiatric morbidity (GHQ-12 caseness scoring). In this sample participants with scores of four or more were identified as cases. Figure 7 shows the percentage of cases in each SWEMWBS category. Surprisingly, the majority of the cases, 52%, were in the 'average' psychological well-being category; with 47% in the 'below average' category, there is a suggestion that while some participants may have high levels of distress and anxiety, they still report fairly positive overall mental well-being.

Figure 7 Minor Psychiatric Morbidity (GHQ-12 Case) by WEMWBS Category



*Design weighted percentages

[2] Weighted means and standard deviations; means did not differ by country

FUTURE ANALYSES

The health module of *Understanding Society* will have measures that are repeated annually as well as some that are rotated less frequently. The annual measures include the SF-12, GHQ-12, life and health satisfaction, long-term illness and limitations and newly diagnosed health conditions. Beginning at Wave 2, measures of height and weight will be taken biennially by nurses and trained data collectors. Brief questions on health-related behaviours, i.e. smoking, alcohol consumption, and physical activity, etc. will be included in the Wave 2 interviews and then asked about every three years. More detailed questions on health-related behaviours will be included in Wave 5 and then asked every six years. Other measures of psychological well-being, including the SWEMWBS were measured in Wave 1 and then biennially. Measures of psychological traits will begin in Wave 2. However, the frequency of administration of these scales has yet to be determined.

In addition to the psychosocial measures described above, *Understanding Society* will collect biomarkers from 25,000 -30,000 participants. During Wave 2 or 3, nurses will visit a random sample of households to collect blood samples and take measures of lung function, blood pressure, pulse, height, weight, waist circumference, bio-impedance and grip strength. In a second phase, trained interviewers will take measures from a further larger sample of households.

Data linkage has been a great resource to academic researchers and *Understanding Society* is taking steps to ensure that participant data is linked to health registers and hospital records. The scope from combining geographical, physical, biological and linkage data with survey data for research is great. *Understanding Society* will be a unique resource for tracking the health of the UK population into the future.

Sample Size

Most analyses are based on adults who completed the individual interview (22,265) with some reduction for missing values for individual health or social measures. Analyses of psychological distress and well-being are based on respondents to the self-completion questionnaire (19,168).

Findings

Health in the UK can be examined via individuals' perceptions, through the presence of long-term illnesses, through level of functioning and for the impact of diagnosed conditions.

For selected conditions, (cancer, diabetes, clinical depression, respiratory disease, and cardiovascular disease) a summary measure of physical functioning PCS was below average, with those who had ever been diagnosed with diabetes and cardiovascular disease having the lowest functioning, while those with clinical depression and respiratory disease had significantly higher functioning, albeit below average. For a summary measure of mental functioning, the most affected were those ever diagnosed with clinical depression. People who had ever been diagnosed with cancer, diabetes, respiratory or cardiovascular disease had MCS within the normal range. Low levels of physical functioning do not translate into low levels of mental functioning.

Examining participants of working age (16-59 for females, 16-64 for males), participants with a long term illness that was not limiting were just as likely to be employed as those without a long term illness, but those with a limiting long term illness were twice as likely to be inactive and about one third more likely to be unemployed than those with no illness or no limitations.

For those over the current retirement age and under 70 years, 28% with no long term illnesses or with no limitations were in employment while only 13% with limiting long term illnesses were employed; 43% of inactive participants in this age range had a limiting long term illness. This large share of those who would not be in the retirement age under some proposals would be likely to be unable to work.

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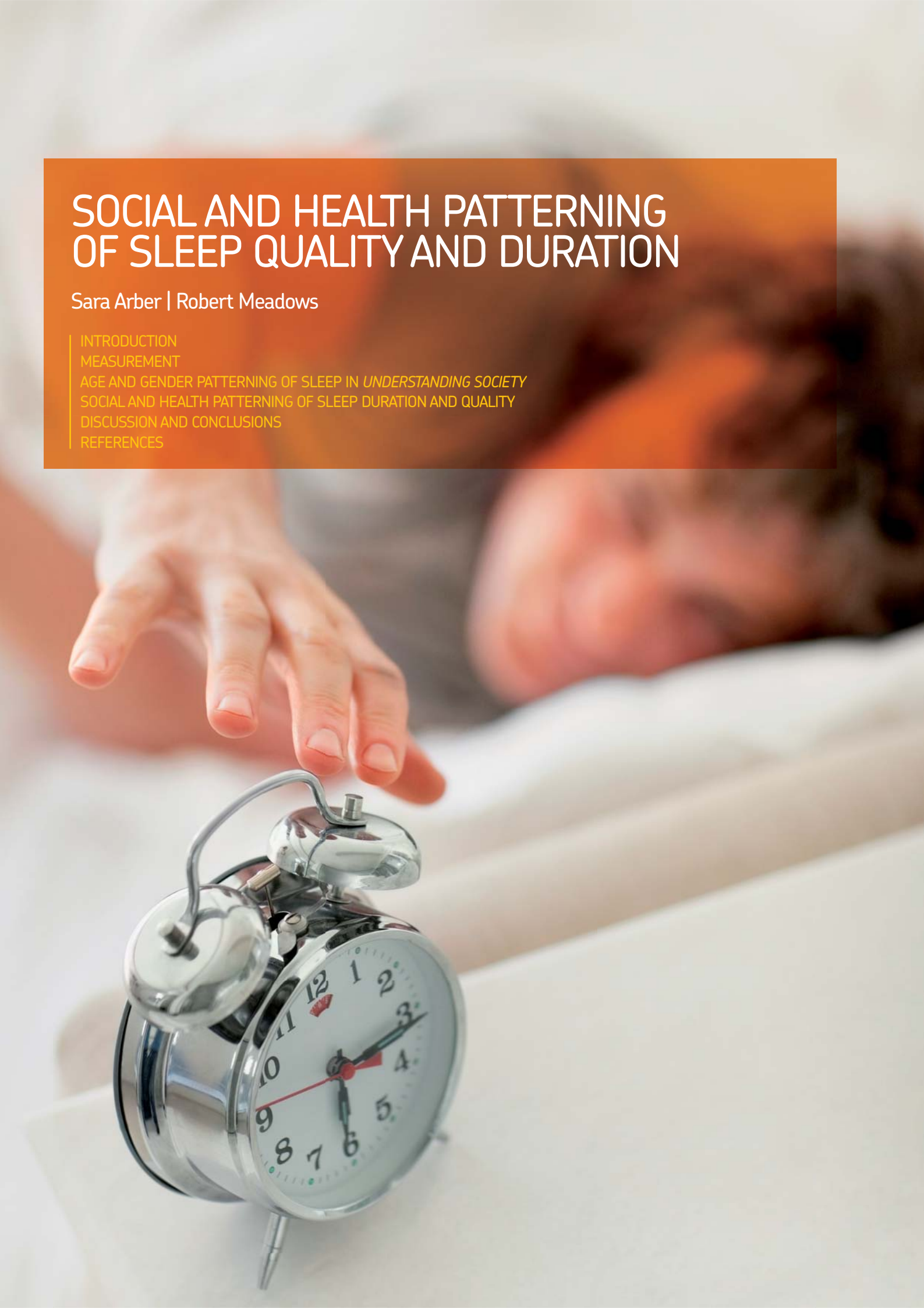
SOCIAL AND HEALTH PATTERNING OF SLEEP QUALITY AND DURATION

Sara Arber | Robert Meadows



INTRODUCTION

Social scientists have paid scant attention to sleep quality or duration. This is surprising given the importance of sleep problems to society in terms of health, well-being, safety, productivity and performance. Poor sleep is implicated in increased sickness absence and accidents, as well as the high costs of sleeping medication. Sleep is therefore a relevant issue for public health and public policy (Williams, Meadows & Arber, 2010).

The links between poor sleep and both physical and psychological ill-health are well-known. Chronic ill-health and disability often cause pain and discomfort at night, resulting in sleep complaints and disorders (Vitiello, Moe & Prinz, 2002). Research has consistently found strong associations between depression and poor sleep quality. Recent evidence suggests that sleep problems often *predate* the onset of ill-health, rather than solely being a consequence of ill-health. A recent systematic review of prospective studies concluded that both short sleep (under 7 hours) and long sleep (9 or more hours per night) were associated with higher mortality (Cappuccio, Lanfranco, Strazzvillo & Miller, 2010). Longitudinal studies from a range of countries show that disrupted sleep and short sleep duration are implicated in higher levels of obesity, diabetes, hypertension and other health conditions (Gangwisch et al., 2007; Ferrie et al., 2007; Ikehara et al., 2009).

One reason for the lack of UK social scientific research on sleep is that few British national datasets have hitherto collected data on sleep. An exception is the British *Psychiatric Morbidity Survey* (PMS) (Singleton, Bumpstead, O'Brien, Lee & Meltzer, 2001). In analyses of this dataset, sleep problems were associated with disadvantaged socio-economic circumstances, even when adjusting for socio-demographic characteristics, smoking, poor health and depression (Arber, Bote & Meadows, 2009). However, the PMS contains relatively few questions on the social and work aspects of respondents' lives. In contrast, studies of sleep in other countries have analysed the associations of sleep problems with a broader range of social variables. For example, researchers have shown how subjective financial well-being in childhood and adulthood have adverse effects on sleep in midlife, net of income and other socio-economic variables (Lallukka, Rahkonen, Lahelma & Arber, 2010); and how sleep complaints are associated with physically strenuous working conditions, psychosocial job strain and work-family conflicts (Sekine, Chandola, Martikainen, Marmot & Kagamimori, 2006; Lallukka, Arber, Rahkonen & Lahelma, 2010). Comparable analyses could be undertaken using *Understanding Society*.

At present there are no UK datasets which:

- Provide a range of questions pertaining to sleep duration and quality;
- Allow estimation of the effects of a diversity of social characteristics, including health, health behaviours, socio-economic circumstances, working conditions, neighbourhood characteristics and family circumstances on sleep problems; and
- Collect sleep items on repeated occasions using a longitudinal design.

Understanding Society fulfils all three criteria, allowing such analyses based on a large nationally representative UK sample.

This chapter will summarise the age and gender profile of responses to the 7 sleep items in *Understanding Society* (Wave 1), and illustrate the patterning of these sleep measures with health and socio-economic circumstances.

MEASUREMENT

When considering the measurement of *Sleep duration*, it is important to recognise that sleep is a complex and multifaceted phenomenon, which has both a physiological and a rich social, cultural, moral and metaphorical heritage (Williams, Meadows & Arber, 2010). Because of its very nature, sleep is a liminal/non-conscious activity and individuals may not 'know' much about it. Individuals may also have their own definitions and normative expectations regarding 'ideal', 'adequate' or 'enough' sleep, which may be context dependent.

Understanding Society (Wave 1) included seven questions about sleep in the self-completion component. These questions, and the response categories, mirror some aspects of the 17-item Pittsburgh Sleep Quality Index (Buysse, Reynolds, Monk, Buman & Kupfer, 1989). They also have similarities to the Jenkins Sleep Questionnaire (Jenkins, Stanton, Niemcryk & Rose, 1988), which asks whether individuals have experienced trouble falling asleep, trouble staying awake, waking up at night, and waking up feeling tired.

Sleep Duration was self-recorded in actual hours and minutes based on the question 'How many hours of actual sleep did you usually get at night during the last month?'

Three questions asked about the frequency of different reasons for trouble sleeping during the past month, each with five response categories from 'Not during the past month' to 'More than once most nights'. The first asked about *Sleep latency*, whether the respondent 'cannot get to sleep within 30 minutes?' The second addressed *Sleep maintenance* in terms of how often the respondent reported they 'wake up in the middle of the night or early in the morning?' and the third how frequently the respondent had trouble sleeping because they *'Cough or snore loudly?'* The latter item had high levels of non-response with 18% of women and 15% of men recorded as 'don't know', which increased markedly with age, from 8% of men and women younger than age 45 to 38% of women and 30% of men over 65 years of age. Since a person may not be aware whether they snore at night, except through reports from a co-sleeping partner, it is perhaps unsurprising that non-response increased with age, given increases in widowhood and relaxation of norms about partners sharing a bedroom above age 60 (Hislop, 2007).

Two questions addressed possible responses to perceived sleep problems. The first was taking *Sleep medication* – 'During the past month, how often have you taken medicine (prescribed or 'over the counter') to help you sleep?' with four response categories from 'Not during the past month' to 'Three or more times a week'. The second asked about *Daytime sleepiness*, which relates to whether an individual falls asleep while they are engaged in everyday activities. Respondents were asked 'During the past month, how often have you had trouble staying awake while driving, eating meals, or engaging in social activity?' Such daytime sleepiness could be potentially dangerous if a person has trouble staying awake while driving. This sleep item does not measure falling asleep while watching television or reading the newspaper, which is much more prevalent, especially in later life, and often referred to as 'dozing' (Venn & Arber, forthcoming).

The final sleep item measured self-reported *Sleep quality* – 'During the past month, how would you rate your sleep quality overall?' with four response categories 'very good', 'fairly good', 'fairly bad', 'very bad'. This could be seen as providing a summary of a person's self-perception of the various aspects of their sleep.

The analyses reported in this chapter are based on unweighted data from the self-completion component of *Understanding Society* for respondents aged 16 and over. The number of valid responses varied between the seven sleep items mainly due to 'don't know' responses, varying from 14,506 for '*cough or snore*' to 17,326 for '*Sleep quality*'.

AGE AND GENDER PATTERNING OF SLEEP IN *UNDERSTANDING SOCIETY*

This section examines the gender and age patterning of responses to the seven sleep items. We pay particular attention to those who report problematic sleep, namely short duration (under 6 hours), sleep problems which trouble them at least 3 nights a week, taking sleeping medication and reporting 'bad' sleep quality.

SLEEP DURATION

Twelve percent of respondents report very short sleep of under 6 hours per night and an additional 16% report short sleep of under 6 1/2 hours (Table 1a). These levels of short sleep duration would usually be considered to have adverse effects on health if maintained for lengthy periods. Twelve percent self-report long sleep of 8.5 hours or longer, while only 3% report sleeping for at least 9.5 hours.

Women are slightly more likely to report both short and long sleep durations. Age has a much greater effect on sleep duration than gender. Figure 1a shows an approximately linear gradient of short sleep (under 6 hours) increasing with age for women, whereas for men the peak age is 45-54. Women over age 85 are particularly likely to report short sleep.

SLEEP LATENCY

Women are more likely to report problems getting to sleep within 30 minutes, 24% on 3 or more nights a week, compared to 18% of men (Table 1b). Women's greater problems with sleep latency occur particularly from midlife onwards (Figure 1b). Problems getting to sleep on 3 or more nights per week are high under age 25. For women, problems getting to sleep increase to age 64, are stable to age 84 and are highest among those 85 or older. For men, problems getting to sleep slightly decrease to age 55 and are then stable.

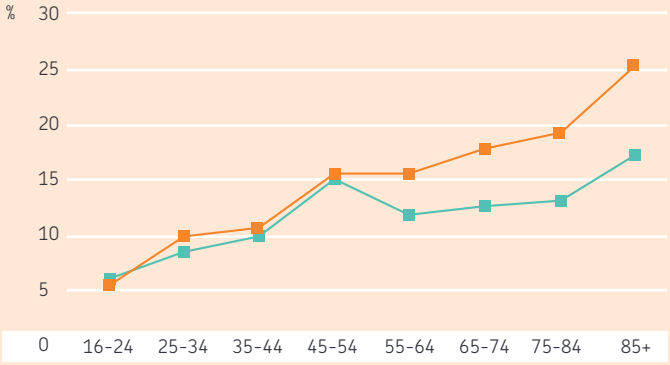
SLEEP MAINTENANCE

Women are more likely than men to report problems waking up during the night or early in the morning (Table 1c). There is a clear age effect, with problems reported on 3 or more nights per week increasing with age (Figure 1c), especially for men. Half of men and women over age 65 report sleep maintenance problems on 3 or more nights per week, compared to under a fifth of men and a third of women under 25. Thus, both age and gender affect the likelihood of waking during the night or problems of early morning wakening.

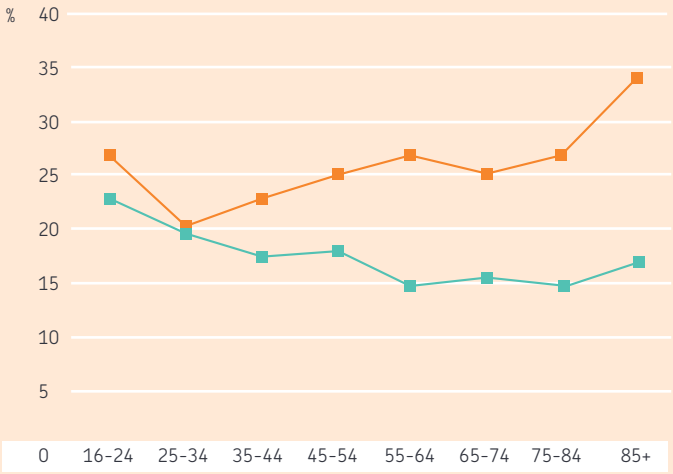
Figure 1 Sleep Items by gender and age group

WOMEN MEN

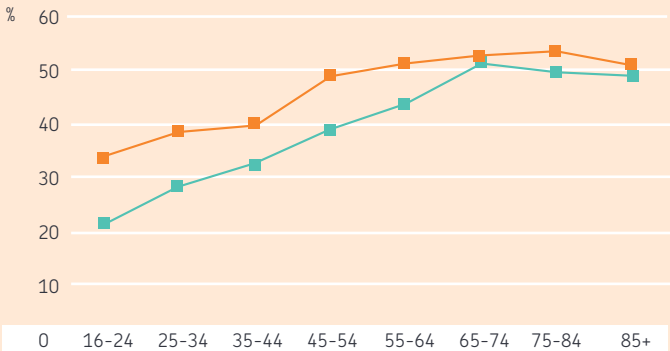
(a) Sleep duration – Under 6 hours



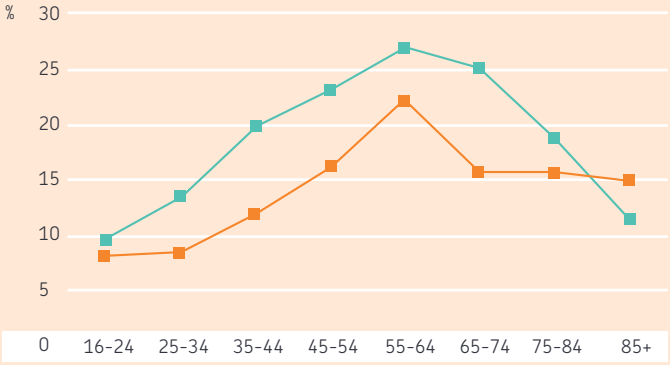
(b) Sleep latency – cannot get to sleep within 30 minutes on 3 or more nights per week



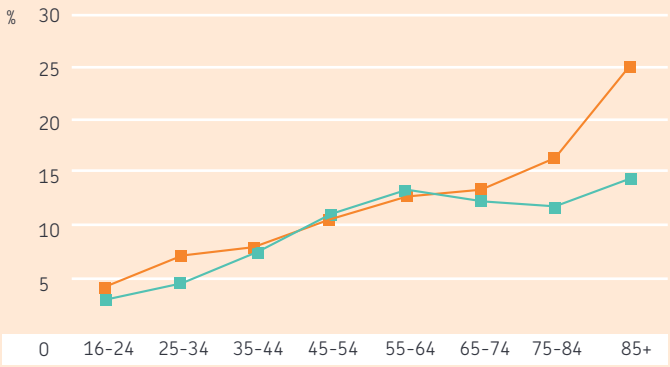
(c) Sleep maintenance – Wake in the middle of the night or early morning on 3 or more nights per week



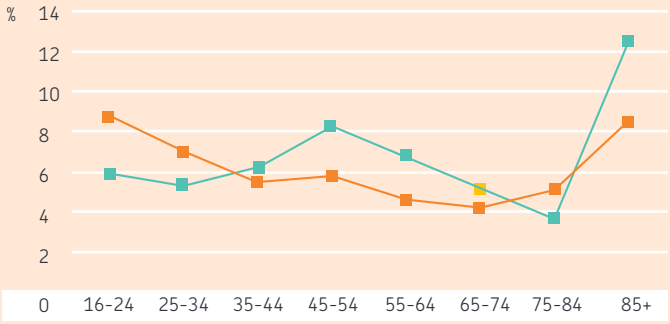
(d) Cough or snore loudly on 3 or more nights per week



(e) Sleeping medication – Taken on 3 or more nights per week



(f) Daytime sleepiness – Trouble staying awake during activities on 3 or more days per week



(g) Sleep quality – Percentage reporting 'fairly bad' or 'very bad' sleep

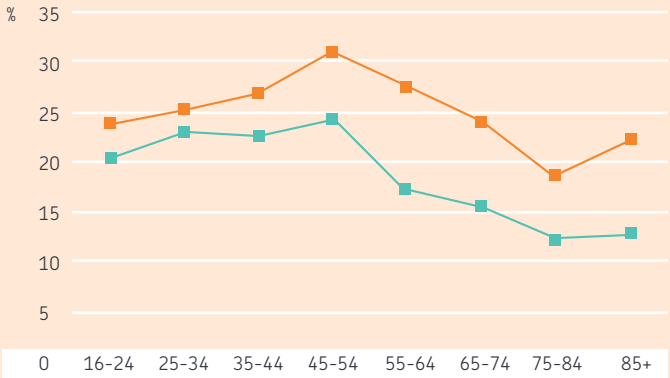


Table 1 Sleep items by sex (Column Percentages)

	Male	Female	Total
a) Usual sleep duration			
< 6 hours	11.1	13.1	12.2
6 < 6.5 hours	15.5	15.6	15.5
6.5 < 7.5 hours	32.6	27.2	29.6
7.5 < 8.5 hours	30.8	31.3	31.1
8.5 < 9.5 hours	7.1	9.3	8.3
≥ 9.5 hours	3.0	3.6	3.4
N	**7,212**	**9,215**	**16,427**
b) Sleep latency – can't get to sleep in 30 mins			
Not in last month	45.1	37.1	40.6
< Once a week	22.3	21.3	21.7
Once/twice a week	15.1	17.5	16.4
3+ times a week	8.2	11.6	10.1
More than once most nights	9.3	12.5	11.1
N	**6,974**	**8,887**	**15,861**
c) Sleep maintenance – waking in night			
Not in last month	24.5	19.3	21.5
< Once a week	18.0	16.1	16.9
Once/twice a week	21.3	20.8	21.0
3+ times a week	18.4	19.8	19.2
More than once most nights	17.7	24.0	21.3
N	**7,056**	**9,196**	**16,252**
d) Cough or snore loudly at night			
Not in last month	56.9	68.0	63.1
< Once a week	13.5	11.4	12.4
Once/twice a week	10.7	7.7	9.1
3+ times a week	7.9	5.3	6.4
More than once most nights	11.0	7.5	9.1
N	**6,444**	**8,042**	**14,486**
e) Take sleeping medication			
Not in last month	84.3	81.8	82.9
< Once a week	4.3	5.0	4.7
Once/twice a week	2.2	3.1	2.7
3+ times a week	9.2	10.1	9.7
N	**7,475**	**9,648**	**17,123**
f) Trouble staying awake in day			
Not in last month	83.3	86.0	84.8
< Once a week	10.5	8.1	9.1
Once/twice a week	4.6	4.2	4.3
3+ times a week	1.7	1.8	1.7
N	**7,478**	**9,625**	**17,103**
g) Sleep quality			
Very good	26.7	23.3	24.8
Fairly good	53.8	51.1	52.3
Fairly bad	15.8	20.6	18.5
Very bad	3.8	5.1	4.5
N	**7,535**	**9,791**	**17,326**

COUGHING OR SNORING

More men than women report that snoring or coughing disturbs their sleep, 30% of men and 20% of women more than once per week (Table 1d). Men's sleep is more likely to be adversely affected by coughing or snoring than women, particularly from ages 44-74 (Figure 1d). The peak age for sleep disturbance for this reason for women is 55-64, but it is important to note the high levels of non-response, especially among older women, which may alter the age pattern.

SLEEPING MEDICATION

A tenth of people report taking sleeping medication on 3 or more nights a week (9% of men and 10% of women), while 84% of men and 82% of women say that they have not taken sleeping medication in the past month (Table 1e). A strong and linear age gradient is found, especially for women (Figure 1e), with 25% of women and 15% of men over 85 taking sleeping medication on three or more nights a week.

DAYTIME SLEEPINESS

Under 2% of people report difficulty staying awake during the day while engaged in other activities 3 or more times a week (Table 1f). While 83% of men and 86% of women report that this has not happened in the past month. Frequent daytime sleepiness (3 or more times a week) is most common among those over 85. The age pattern for daytime sleepiness at least weekly shows higher levels among young women (16-24), men in midlife (45-54) and among women and men over 85 (Figure 1f).

SLEEP QUALITY

As expected from responses to the other sleep items, women are more likely to negatively rate their sleep quality, 26% compared to 20% of men (Table 1g). However, given the higher prevalence of self-reported sleep problems with increasing age, e.g. waking in the night, use of sleeping medication, and short sleep duration, it could be considered surprising that there is no age gradient in reports of bad sleep quality (Figure 1g). The proportions reporting 'fairly or very bad' sleep are slightly higher in the middle years, especially for women (30% of women aged 45-54), and lower at age 75-84 (at 18%). One reason for this seeming age anomaly in self-assessed sleep quality may relate to social comparisons. Using sleep measures from the Pittsburgh Sleep Quality Index (PSQI), several psychosocial measures, and in-depth interviews with 18 older women, both 'good' and 'poor' sleepers reported significant sleep disruption (Davis, Moore & Bruck, 2007).The authors suggest that the key factor in distinguishing good and poor sleep quality was 'the way that they thought about their own sleep quality, in the wider context of their construction of normal sleep, which was often based on their engagement with comparison strategies' (Davis et al. 2007, para.5.11).

Table 2 Pearson correlations between sleep items

	Sleep duration	Sleep latency	Sleep maintenance	Snore or cough	Sleep medication	Daytime sleepiness	Sleep quality
Sleep duration	–	-.29	-.35	-.12	-.09	-.13	-.46
Sleep latency		–	.47	.21	.19	.16	.54
Sleep maintenance			–	.27	.17	.14	.53
Snore or cough				–	.16	.13	.20
Sleeping medication					–	.14	.23
Daytime sleepiness							.26
Sleep quality							–

Minimum n= 14,254

SUMMARY

The seven sleep items vary in their relationship with age and gender. Short sleep duration and waking during the night both increase strongly with age, as does taking sleeping medication. Difficulty trying to get to sleep (sleep latency) is highest for the youngest age group, then shows a modest *positive* association with age for women and a modest *inverse* association for men.

Present findings suggest that self-assessed sleep quality is poorest in mid-life (45-54) for both men and women, with ratings of bad sleep less frequent among those over 75. This seems anomalous given the higher prevalence of waking in the night, use of sleeping medication, and short sleep duration with age. However, as previously noted, self-assessed sleep quality may be bound up within social comparison strategies and the idea that 'no matter how bad my sleep is, it is not as bad as his/hers'. There is also some debate within clinical circles as to how to interpret this apparent anomaly. It has long been argued that, as we age, the amount of time spent in deep, slow wave sleep diminishes, while the time spent in lighter, stage 1 and stage 2 sleep increases. Therefore, older people often have more fragmented sleep and wake up earlier (Bliwise, 2005). What is less clear is whether this is a problem or a sign of a reduced capacity/need for sleep as we age (Klerman & Dijk, 2008). If the latter, the linear increase in sleeping medication use with age suggests an inappropriate response to older people's sleep profile.

The seven sleep items tap into diverse aspects of sleep, and as expected show varying levels of inter-correlations with each other (Table 2). Sleep duration is negatively correlated with all other sleep items, since short sleep duration is likely to be a consequence of many of the sleep problems identified. The lowest correlation is with sleeping medication (-.09), suggesting that taking sleeping medication has little association with reported sleep duration. There is a strong correlation between sleep latency and sleep maintenance (.47). Overall, the strongest inter-correlations are between sleep quality and the other six items. However, as already noted, sleep quality is unrelated to age, unlike most of the other sleep items.

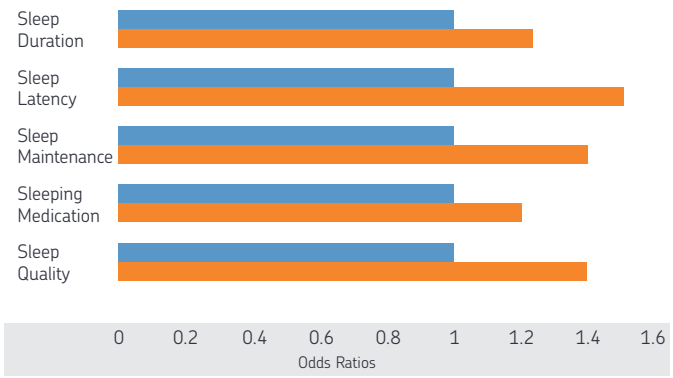
SOCIAL AND HEALTH PATTERNING OF SLEEP DURATION AND QUALITY

Sleep problems are closely associated with ill-health, although the direction of causation is not always clear. Debates about inequalities in health have been ongoing for the last 30 years, with research and policy concerns focused on the strong link between disadvantaged socio-economic circumstances and ill-health/mortality. It is therefore important to consider the ways in which sleep problems are associated with *both* socio-economic circumstances and ill-health, since sleep problems may be one of the intermediary mechanisms through which disadvantaged socio-economic circumstances are linked to ill-health.

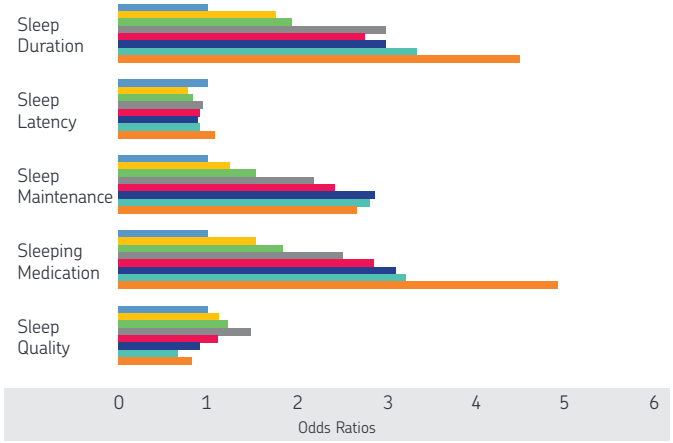
This section provides preliminary analyses related to this topic by examining how demographic characteristics (gender, age, marital status), socio-economic characteristics (education, employment status, social class) and two health measures are associated with five of the sleep items. These sleep items are each dichotomised as in Figure 1 to indicate more problematic sleep: *Sleep duration* as under 6 hours sleep per night; *Sleep latency* as not being able to get to sleep within 30 minutes on 3 or more nights per week; *Sleep maintenance* as waking up in the middle of the night or early in the morning on 3 or more nights per week; taking *Sleeping medication* on one or more nights per week; and self-rated *Sleep quality* as 'fairly bad' or 'very bad'. We present age and sex adjusted odds ratios from logistic regression analyses (Figure 2), and briefly contrast the similarities and differences of the social patterning across the five different sleep items. The odds ratio is a measure of the strength of association. A value of 1.0 shows no association, while positive associations have odds ratios above 1.0 and negative associations are below 1.0.

Figure 2 Adjusted odds ratios of 5 sleep variables* with socio-demographic, socio-economic and health variables

(a) Gender (age-adjusted)

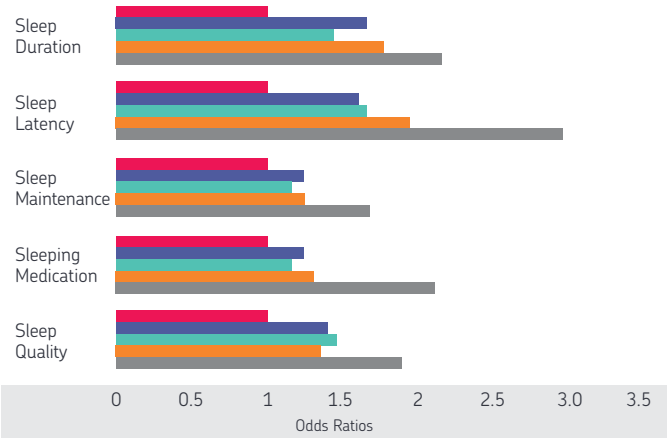


(b) Age (sex-adjusted)

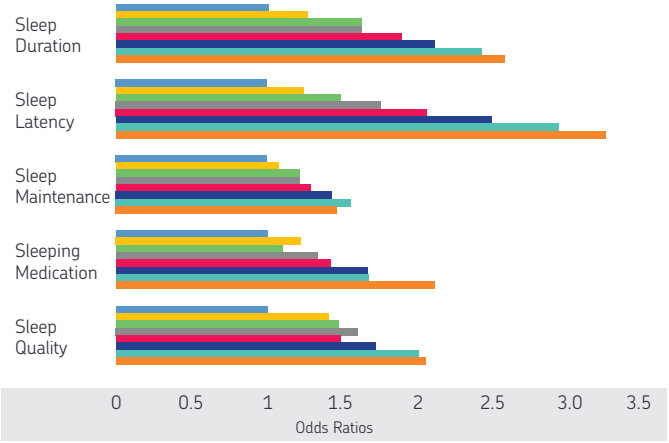


(c) Marital status (age-sex adjusted)

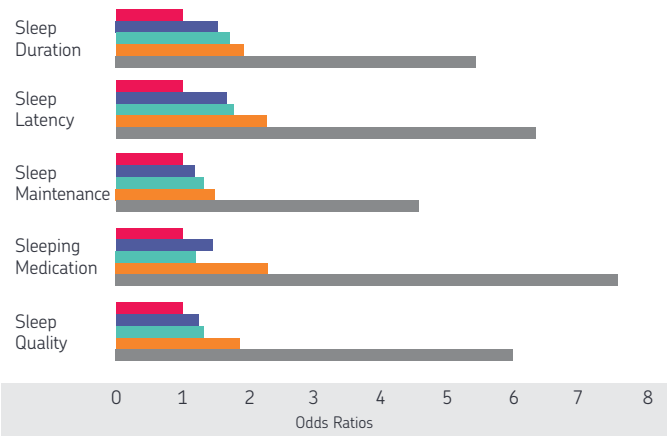
(d) Educational qualifications (age-sex adjusted)



(e) Social class (NS-SEC) (age-sex adjusted)

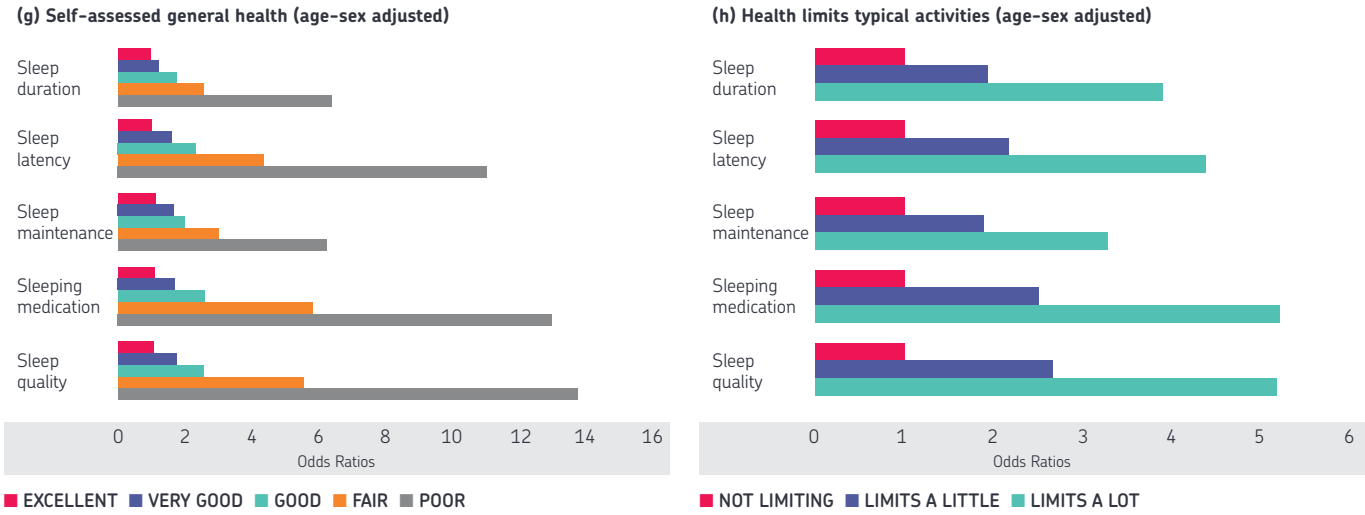


(f) Employment status (age-sex adjusted)



*Sleep duration: Under 6 hours; **Sleep latency:** Unable to get to sleep in 30 minutes on 3 or more nights per week; **Sleep maintenance:** Wake up in the middle of the night or early in the morning on 3 or more nights per week; **Sleeping medication**: Take medicine to help sleep on 1 or more nights per week; **Sleep quality:** Self-assessed sleep as 'fairly bad' or 'very bad'

Figure 2 Continued



GENDER, AGE AND MARITAL STATUS

Women have higher odds of 'less desirable' sleep in each case, with age-adjusted odds ratios varying from 1.20 for taking sleeping medication to 1.49 for problems getting to sleep (Figure 2a). These odds are similar to the gender difference in sleep problems (OR=1.40) reported by Arber et al. (2009).

There are contrasting age profiles across the five sleep items as shown in the odds ratios by age (adjusted for sex), Figure 2b. The strongest and most linear age gradients are for short sleep duration and taking sleeping medication, where the odds increase from 1.00 (age 16-24, the reference category) to 4.56 for short sleep duration and 4.9 for taking sleeping medication among those aged 85 or older. The gradient is shallower but also linear for sleep maintenance, whereas the associations of age with sleep latency and sleep quality are non-linear.

All other socio-demographic, socio-economic and health variables in Figure 2 are adjusted for age and sex. For marital status, the pattern of associations across the five sleep items is similar (Figure 2c). In each case the married (reference category) report the best sleep while the divorced/separated are most likely to report more problematic sleep, varying from an odds ratio of 1.93 for short sleep duration to 1.34 for problems with sleep maintenance. The widowed also report significantly poorer sleep on each measure, which is worse than that of the never married, except in the case of taking sleeping medication.

Those with no educational qualifications report the poorest sleep

SOCIO-ECONOMIC PATTERNING OF SLEEP

Three illustrative measures of socio-economic circumstances are considered in Figure 2: highest educational qualifications, social class and employment status. For each sleep item there is a linear (or almost linear) gradient with highest educational qualifications (Figure 2c). Those with no qualifications report the poorest sleep, which varies from an odds ratio of 2.9 (compared to OR=1.0, with a degree) for sleep latency to 1.66 for problems with sleep maintenance, with sleep quality occupying an intermediate position (OR=1.91).

Social class, measured by the respondent's current or last occupation according to National Statistics-Socio-economic Classification (NS-SEC), has a linear (or almost linear) gradient with all five sleep items (Figure 2d). Those in routine occupations (compared to the reference category of higher professional occupations) report the poorest sleep, varying from an odds ratio of 3.22 for sleep latency to 1.48 for problems with sleep maintenance.

The pattern of associations with current employment status is consistent across all five sleep items (Figure 2e). In each case the best sleep is reported by those who are employed or self-employed (the reference category, OR=1) (Figure 2f).

The unemployed report significantly poorer sleep than those employed, with an odds ratio of 2.26 for sleep latency and 2.24 for sleep medication, reducing to 1.44 for sleep maintenance. The retired and those looking after a family and home occupy an intermediary position between the poor sleep of the unemployed and the good sleep of the employed, with the retired reporting consistently better sleep than those looking after a family/home apart from in relation to taking sleeping medication. Those not working because of disability or for other ill-health reasons have by far the poorest sleep with odds ratios varying from 7.43 for sleeping medication to 4.42 for problems of sleep maintenance.

HEALTH

Two measures of self-reported health are considered. *Self-rated (or self-assessed) health* was measured by asking: 'How is your health in general? Would you say your health is excellent, very good, good, fair or poor?' There is an exceptionally strong age-sex adjusted linear gradient for all the sleep items, varying from an odds ratio of 13.56 for 'poor' health (compared to the reference category of 'excellent' health) for sleep quality and 12.74 for taking sleeping medication, to 6.24 for short sleep duration and 6.3 for problems of sleep maintenance (Figure 2g). Similarly there is a strong gradient of sleep problems with *Limiting ill-health* varying from an odds ratio of 5.15 for limits typical activities 'a lot' (compared to OR=1.0, 'no limiting illness') for taking sleeping medication and 5.08 for sleep quality, to 3.41 for problems of sleep maintenance.

SUMMARY

This section has shown that the 5 sleep items are strongly related to marital status, health, and socio-economic variables in remarkably similar ways. The married consistently report the best sleep and the divorced/separated the poorest sleep. For each sleep measure those in more disadvantageous socio-economic circumstances are more likely to report problematic sleep. The associations between all the sleep items and both poor self-assessed health and limiting ill-health are very stark. Because of the inter-correlations between socio-economic and health variables, a key goal for future work will be to disentangle the independent effects of each of these with sleep items while adjusting for other variables.

For each sleep item, women are more likely to report problematic sleep with the greatest gender difference for sleep latency and the smallest for taking sleeping medication. These gender differences are comparable to Zhang and Wing's (2006) findings from their meta-analysis of gender differences in insomnia and Arber et al.'s (2009) findings. There has been substantial attention within sleep research to gender differences in sleep (Zhang & Wing, 2006), but surprisingly little research on socio-economic differences in sleep, which Figure 2 shows are much more pronounced than those for gender. In contrast to the consistency of the patterning of socio-economic and health variables with these five sleep items, the associations of the various sleep measures with age are diverse and warrant further investigation.

DISCUSSION AND CONCLUSIONS

The seven sleep items in *Understanding Society* provide a rich resource for secondary analysis. We have documented the age and gender pattern of these sleep items, and demonstrated strong linkages between disadvantaged socio-economic (SES) circumstances and sleep problems, as well as short sleep duration.

People with greater health limitations have poorer sleep

The findings that people with more disadvantaged SES report greater sleep problems need further consideration by health researchers. First, to undertake research to identify what factors associated with low SES are causally implicated in sleep problems in order to identify the underlying causal mechanisms, e.g. what part is played by the different intermediary mechanisms of work characteristics, environmental circumstances, psychosocial stress, worries, and poor health? Second, longitudinal studies are needed to examine a wide range of SES variables, measures of health status, and quality of sleep in order to better assess the causal ordering between SES, health and sleep quality.

Understanding Society offers the possibilities for both of these lines of analysis. A more complete analysis of Wave 1, for example, could (i) simultaneously consider the independent effects of a wide range of socio-economic variables (e.g. education, social class, income, employment status, housing tenure), as well as work and neighbourhood characteristics; (ii) assess to what extent the higher prevalence of sleep problems among individuals with low education, not working and in lower social classes may be due to their poor physical and mental health, by examining models including physical and psychological health measures; and (iii) consider the *relative associations* between different sets of factors and sleep problems. For example, lifestyle behaviours (smoking, obesity) and worries may be confounded with socio-economic characteristics; and the relationships between sleep problems and living on a

low income or being unemployed may be partially mediated through worries or smoking. That is, as mediators, worries or smoking may be intervening variables which partially or wholly explain the association between the socio-economic characteristic and sleep problems. Arber et al. (2009) suggested that lack of employment may be linked to sleep problems in two ways; for the unemployed, primarily through its intrinsic relationship with worries, while for the economically inactive, primarily because of their poorer health status. Retaining the sleep items in future waves will allow analysis of the direction of causation between employment status, ill-health and sleep quality, and an examination of whether part of the mechanism which links low socio-economic status to poor health may be through the intermediary pathway of poor sleep.

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Sample Size

The sample is respondents aged 16 or older who completed the self-completion component of *Understanding Society*. The number of valid responses varied between the seven sleep items mainly due to 'don't know' responses, varying from 14,506 for *'Cough or snore'* to 17,326 for *'Sleep quality'*.

Findings

This chapter highlights the utility of seven questions about sleep: duration; latency or getting to sleep; staying asleep; coughing and snoring; sleepiness in the daytime; taking sleep medications; and perceived quality of sleep. The questions assess diverse aspects of sleep, with varying levels of inter-correlations with each other. Sleep duration is negatively correlated with all other items, since short sleep duration is likely to be a consequence of many of the sleep problems identified. There are strong correlations between sleep latency and sleep maintenance and between sleep quality and the other items.

Women consistently are more likely to have sleep problems than men. Several sleep problems increase with age, particularly short duration, taking sleeping medication, and waking up in the night. When adjusting for age and gender, married people have better sleep patterns than divorced and separated persons and the widowed.

For each sleep measure, those in more disadvantageous socio-economic circumstances are more likely to report problematic sleep. There are also very strong associations between poor sleep and negative health perceptions and having health conditions that have limiting effects.

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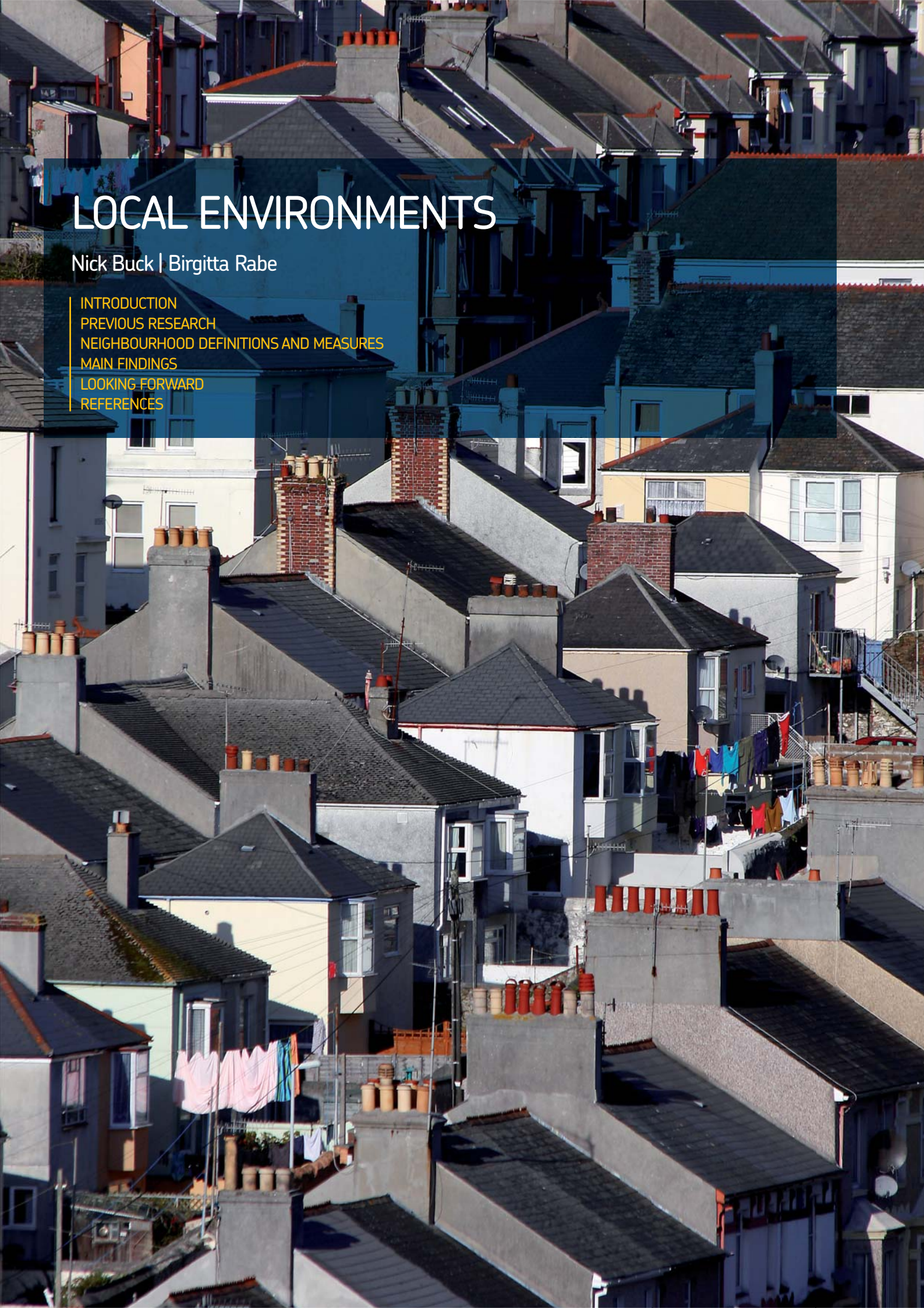

LOCAL ENVIRONMENTS

Nick Buck | Birgitta Rabe

INTRODUCTION

People do not live as individuals in isolation. They interact with a range of different sorts of surrounding networks and environments. These interactions take place over different scales, which we can see as a set of widening contexts. Firstly, the study of interactions with the immediate co-residents in the household is an integral part of the household panel study design. The wider contexts and environments can be both spatial units and the networks within which people are located. Examples of the former include local neighbourhoods and administrative areas, which may vary in the quality and availability of local services. There are also economically relevant areas such as 'travel to work areas' within which people look for jobs and where the balance between the supply and demand for work may affect individuals' chances of getting good quality employment. There are in addition networks of family, friends, neighbours and work colleagues living outside the individual's own household with whom they interact and upon whom they may rely for support.

Understanding Society is designed to provide opportunities for research on the impact of and interaction with many of these contexts. Here we mainly focus on spatial variations and their implications, though the study also collects a significant amount of information on social networks. There is an increasing interest in the ways that the spatial context, within which social or economic processes take place, may have significant effects on the life chances of individuals. Space may be a significant dimension in structuring social and economic inequality. There has been a longstanding concern with the potential role for spatially differentiated policy and the targeting of policy to particular areas.

Understanding Society opens a range of new opportunities for local area research. Geographical identifiers are being made available at small area levels with appropriate protections to preserve the confidentiality of study participants. This enables researchers to merge a wealth of data on area characteristics to individuals' responses. Moreover, the survey elicits information on perceptions of neighbourhoods and local services directly from respondents. By following people over time it provides a basis for analysing migration, residential mobility and location choice. This chapter gives examples of the type of research that can be done in the area of neighbourhood research using *Understanding Society*.

PREVIOUS RESEARCH

There is a large body of literature which seeks to quantify the relationship between various aspects of the residential environment and numerous behaviours and outcomes for the individuals residing in these environments. The behaviours and outcomes that have been related to neighbourhood characteristics range from child development, educational outcomes, delinquency, teen pregnancy, social exclusion and health to employment and earnings, and more. Examples are papers that look at the effects of living in deprived or disadvantaged neighbourhoods on children's cognitive test scores (McCulloch & Joshi, 2001), measures of social exclusion (Buck, 2001), mental health (Propper et al., 2005), and residential mobility (Rabe & Taylor, 2010).

An important distinction to make in the interpretation of these relationships is the extent to which they are compositional, i.e. the outcomes result from the individuals' characteristics rather than their location, and the extent to which they are neighbourhood effects. This means that the outcomes result from contextual community influences not solely attributable to the aggregated demographic characteristics of individuals of the neighbourhood.

The analysis of neighbourhood effects faces several methodological and data issues (Buck, 2001). Individuals are influenced by their context and at the same time influence that context, so that contextual effects cannot be separately identified from endogenous effects, that is, there is a propensity for an individual to adjust its behaviour according to the group behaviour. Another issue is the existence of important unmeasured individual or area characteristics, which may be the basis for selection of individuals into neighbourhoods and affect outcomes. Moreover, the spatial scales at which neighbourhood effects may operate need consideration.

There are several causal pathways through which neighbourhood effects may arise. Social-interactive mechanisms refer to processes endogenous to neighbourhoods, such as behaviours, attitudes and aspirations of residents being changed by contact with peers, or collective socialisation where individuals are encouraged to conform to local social norms conveyed by neighbourhood role models (Jencks & Mayer, 1990; Buck, 2001; Galster, 2010). Neighbourhood effects may also result from natural or human-made attributes of the local space such as the beauty of the landscape, pollution, deteriorated houses and exposure to violence. Alternatively, they may arise because neighbourhoods are not conveniently located for residents to access services and other opportunities.

Some studies directly assess the mechanisms that potentially drive neighbourhood effects. One example for this is social cohesion, which has been examined as a mediating factor affecting neighbourhood violent crime (Sampson, Raudenbush, & Earls, 1997) and health outcomes (McCulloch, 2003, Pevalin & Rose, 2003). Previous research has proposed that the differential social capital of neighbourhoods may influence a variety of behaviours and reactions of neighbourhood residents, and hence that the social environment has an important influence on outcomes such as health. A wide range of social capital indicators have been developed, focusing for example on mutual trust, identification with

the common values of residents and the willingness to intervene for the common good. Neighbourhood cohesion (or its individual-level equivalent, sense of community/cohesion) is one of the instruments used to measure social capital and collective efficacy (Fone, Farewell & Dunstan, 2006; McCulloch, 2003; Pevalin & Rose, 2003).

Two factors stand out in relation to the creation of neighbourhood social capital. The first is residential stability, which is important for the development of social capital and social organisation via the formation of densely interconnected social networks. A high rate of residential mobility, especially in areas of decreasing population, fosters institutional disruption and weakened social controls over collective life. In addition to residential tenure, home ownership is therefore one of the proposed covariates of social capital, as financial investment provides homeowners with a vested interest in supporting neighbourhood life (Sampson et al., 1997). The second is area deprivation. At the individual level socio-economic status has a direct role in promoting a sense of control and efficacy. Sampson and associates (1997) assume that an analogous process may work at the community level, where the alienation, exploitation, and dependency wrought by resource deprivation act as a force that hinders mutual trust and the shared willingness to intervene for the common good, even when personal ties are strong.

NEIGHBOURHOOD DEFINITIONS AND MEASURES

The boundaries used to define spatial neighbourhoods should ideally be appropriate to the spatial scale at which neighbourhood effects or associations are likely to operate. For example, the spatial scale to analyse peer group influences would be rather small, while research on the impact of pollutants might require consideration of a larger region. However, often the units of analysis used are determined by data availability rather than by the assumed boundaries of the mechanism in question. Much of the previous UK literature has used electoral wards as a unit of analysis, although these are rather large units. With the creation of Lower Level Super Output Areas (LSOAs) for the collection and publication of small area statistics, there are now smaller geographical units available. Each LSOA has constant boundaries and a mean population of 1,500 and a minimum of 1,000 individuals. LSOAs were constructed by using measures of both proximity (to give a reasonably compact shape) and social homogeneity (the type of dwelling and type of tenure, to establish areas of similar social background). LSOAs would therefore be expected to come closer to the definition of a neighbourhood than electoral wards. Although LSOAs are primarily a statistical geography and thus far from being a perfect definition of a neighbourhood, they do allow more meaningful fine-grained area analysis at the local level than previously used geographical units.

Understanding Society data can be linked to many types of area statistics. One important source of data available at lower geographical levels is Indices of Multiple Deprivation (IMD) (Noble, Wright, Smith & Dibben, 2006), which have been separately computed for England, Scotland, Wales and Northern Ireland. They are based on summarising many types of local area statistics, and they contain separate domain indices. For example, the English IMD has separate indices which capture deprivation related to income, employment, health and disability, education, skills and training, barriers to housing and geographical access to services, as well as crime and the living environment. There is also an overall index, which is a weighted combination of the domain indices. Data at different geographical levels of the UK and from a variety of sources, including Census data, is also available from **http://www.neighbourhood.statistics.gov.uk**.

There are a large number of other possible ways in which area information can be linked. It is possible to link data at the level of larger administrative units, which will be relevant to variations in the delivery of services. Examples include Local Authority Districts for local government services and health service institutions such as Primary Care Trusts. This would support research about the relationship between the variation in area characteristics and individual characteristics and outcomes. The sample size of *Understanding Society* also makes it possible to undertake comparative analysis of specific larger territories, with separate analysis of samples in, for example, Scotland, Wales or London.

Understanding Society allows the study of neighbourhood effects on various outcomes as it collects individual information such as education, employment, earnings, health, fertility and life satisfaction. In addition to these outcomes, it collects measures relating to behaviour and attitudes towards the neighbourhood. Some of these are available at Wave 1, and additional neighbourhood measures will be carried at Wave 3. These will enable researchers to investigate directly some of the processes through which neighbourhoods exert their effects. One such measure is sense of community or cohesion, collected at Wave 1 and repeated at Wave 3. Respondents were asked eight questions from a scale developed by Buckner (1988) about the neighbourhood in which they live, relating to the residents' sense of community felt within the neighbourhood, degree of attraction to live and remain in the neighbourhood, and degree of interaction within the neighbourhood. Each response is coded on a 5-point scale from 'strongly disagree' to 'strongly agree'. The responses can be summed to yield an index of sense of community/cohesion at the individual level. At each wave, respondents are also asked whether they would like and whether they expect to move.

MAIN FINDINGS

We present information on a range of findings from the first wave of *Understanding Society*. The first two examples cover how variations in local context relate to individual characteristics, focusing on neighbourhood deprivation and the amount of green space in the neighbourhood. Next, we examine very briefly the pattern of variation in household income between areas. The main focus here is on spatial scale, and how the extent of variation between areas differs as we change the spatial scale of the units. Finally, we examine variations in sense of community in terms of both individual and area characteristics.

NEIGHBOURHOOD DEPRIVATION

Table 1 shows the characteristics of the population living in the 20% of most deprived and least deprived neighbourhoods using Indices of Multiple Deprivation. Because the IMDs in each country are computed on a slightly different basis and measured at different points in time, this is shown separately for England, Scotland, Wales and Northern Ireland.

The characteristics of individuals shown include age, whether white UK origin, measures of employment status, housing tenure, measures of whether in social housing, and two measures of health, physical and mental, based on the SF-12 battery of questions. There are also three measures of neighbourhood attachment: the sense of community measure discussed above, duration of residence at the address in which the participant was interviewed and whether the participant wishes to move.

There are clear differences between most deprived and less deprived areas in all four countries. Individuals in more deprived areas are younger, more likely to be from an ethnic minority group, less likely to be employed and more likely to be unemployed, more likely to be in social housing and to be in worse physical and mental health. Some of this is not surprising since some of these measures, based on other aggregate data, contribute to the definition of the IMD. However, it is clear that the differences are confirmed in other, individual level data, for example in worse mental health in more deprived areas. The average 'sense of community' is also significantly weaker in more deprived neighbourhoods, and substantially more people want to move from such neighbourhoods. The average length of residence in the neighbourhood is somewhat shorter in more deprived areas.

There are only a few differences between England, Wales, Scotland and Northern Ireland, with rather more unemployed and in social housing in deprived neighbourhoods in Scotland than in the other countries. There are no major ethnic differences in Scotland and Wales. The White UK group includes people who describe themselves as white British, Scottish, Welsh or Northern Irish. It excludes the people who describe themselves as Irish, accounting for the lower proportion of White UK in Northern Ireland. In Northern Ireland also, there is not the same difference in the sense of community measure between more and less deprived areas. The proportion wanting to move from more deprived areas in Northern Ireland is higher than in less deprived areas, but is considerably less than in other parts of the UK.

Table 1 Characteristics of individuals living in the most and least deprived neighbourhoods in England, Wales, Scotland and Northern Ireland

	England		Wales		Scotland		Northern Ireland	
	Most deprived	Least deprived	Most deprived	Least deprived	Most deprived	Least deprived	Most deprived	Least deprived
Age (mean)	44	49	46	50	44	49	46	49
White UK (per cent)	75	91	93	95[1]	93	93	65	86
Employed (per cent)	39.5	52.0	37.7[2]	51.1[2]	39.0	55.7[2]	39.6[2]	53.4[2]
Unemployed (per cent)	11.5	2.7	11.0[2]	3.7[2]	15.1	1.9[2]	10.9[2]	2.0[2]
Living in social housing (per cent)	38	3	39	2	54	3	40	4
Physical health (mean)	47	51	47	51	46	52	46	50
Mental health (mean)	49	52	49	51	48	53	47	52
Sense of community (mean, on scale of 8-40)	27.7	29.4	28.8	30.4	27.6	29.3	30.5[1]	30.0[1]
Duration of residence in years (mean)	13	14	14	17	12	15	15[1]	17[1]
Wanting to move (per cent)	47	34	42	33	50	31	32	21
N (max)	3,311	3,461	228	220	364	372	332	398

Notes: *Understanding Society* Wave 1 Year 1. English Index of Multiple Deprivation 2007 and Welsh Index of Multiple Deprivation 2008 based on Lower Level Super Output Areas; Scottish Index of Multiple Deprivation 2009 based on Scottish data Zones; Northern Ireland Multiple Deprivation Measure 2010 based on Super Output Areas. For each country, most deprived neighbourhoods are the 20% of all areas with the highest deprivation score; least deprived are the 20% with the lowest deprivation score. Physical and mental health are SF-12 norm-based summary subscales. [1]not statistically different from each other; [2]based on small sample size

GREEN SPACE

Table 2 shows the characteristics of the 20% of people living in neighbourhoods with the least green space, compared with those 20% living in neighbourhoods with most green space. Green space is derived from the Generalised Land Use Database 2005 (Department for Communities and Local Government, 2007). It includes domestic gardens as well as other areas of open space. The individual characteristics are the same as in Table 1. The differences between the greenest and least green neighbourhoods are broadly comparable to those found for neighbourhood deprivation, though the age differences are greater, with older people living in greenest neighbourhoods (and hence also fewer employed people). In the greenest neighbourhoods there are relatively very long durations of residence and few people wanting to move. Mental health differences and differences in sense of community are about the same as those between most and least deprived neighbourhoods, though physical health differences are less.

Small scale geographic units are more strongly associated with household income than units with larger population sizes

Table 2 Characteristics of individuals living in the greenest and least green neighbourhoods in England

	Residents in least green neighbourhoods	Residents in greenest neighbourhoods
Age (mean)	42	51
White British (per cent)	71	95
Employed (per cent)	48	43
Unemployed (per cent)	9	4
Living in social housing	21	9
Physical health	49[1)]	50[1)]
Mental health	49	52
Sense of community (mean, on scale of 8-40)	27.3	29.8
Duration of residence in years (mean)	12	16
Wanting to move (per cent)	46	31
N (max)	3,467	3,465

Notes: *Understanding Society* Wave 1 Year 1. Physical and mental health are SF-12 norm-based summary subscales, where 50 is the average. [1)]difference between greenest and least green neighbourhoods not statistically significant

SCALE ISSUES: THE ASSOCIATION BETWEEN HOUSEHOLD INCOME AND AREA CHARACTERISTICS

It is widely perceived that there is important spatial inequality: variation between richer and poorer areas. One key question is the effective scale at which this operates (see Berthoud, 2008). There are clearly regions with higher average incomes than others, but there is also variation between rich neighbourhoods and poor neighbourhoods. If we examine the distribution of incomes in areas at different scales, we may be able to see better the relative importance of smaller scale variation and larger scale variation in accounting for spatial inequalities of income. There are various ways of doing this, and in this chapter we discuss some models of the association between household income and area characteristics at a number of different spatial scales, both controlling and not controlling for household characteristics.

We define a simple ordinary least squares regression model for predicting log equivalised household income from household and area characteristics. This is a statistical technique suitable for interval level outcomes. The income outcome has been expressed on a log scale to partially correct for skewness. It has also been adjusted for household size (equivalised). The household characteristics include two housing tenure categories, along with measures of the household structure, and number of workers. It would clearly be possible to derive a fuller model. Our predictor variables at the area level have been selected from the 2001 Census of Population Small Area Statistics. It would be useful to incorporate more up to date indicators, e.g. of labour market situation in the current recession. However, there is considerable persistence in the spatial distribution of area characteristics, with areas of particularly high unemployment in the current recession likely to be the same as those with high unemployment eight years earlier. Thus, the measures are satisfactory for this preliminary analysis. The tests in regression models which follow are essentially of two types: a) how these associations change at different spatial scales, and how far they persist when household level characteristics are included in the model. The variables included are:

- % of working age economically active men and women who are unemployed
- % of households headed by a professional or managerial worker
- % of the working age population in poor health
- % of the population who have moved in last year
- Population density in persons per hectare

Table 3 Regression models for log equivalised household income

	Output area		Postcode sector		Westminster Parliamentary Constituencies		Local Authority District	
Area variables only								
% unemployed	-0.012	***	-0.011	**	-0.018	**	-0.018	**
% professional and manager	0.015	***	0.017	***	0.016	***	0.016	***
% poor health	-0.014	***	-0.016	**	-0.014	*	-0.012	*
% moved in last year	-0.003	**	-0.005	**	0.001		0.003	
Population density	0.003		-0.015	**	-0.005		-0.009	
Constant	7.242		7.259		7.234		7.191	
R squared	0.080		0.047		0.029		0.024	
Area and household variables								
Social housing renter	-0.108	***	-0.176	***	-0.201	***	-0.208	***
Own with mortgage	0.223	***	0.222	***	0.224	***	0.225	***
N in employment in HH	0.353	***	0.357	***	0.358	***	0.359	***
N children	-0.127	***	-0.126	***	-0.125	***	-0.125	***
N aged 65 & over	0.066	***	0.067	***	0.071	***	0.073	***
Lone parent	-0.043		-0.054	*	-0.062	**	-0.063	**
% unemployed	-0.003	*	0.005		0.001		0.003	
% professional and manager	0.013	***	0.016	***	0.015	***	0.017	***
% poor health	-0.004	**	-0.008	*	-0.009		-0.008	
% moved in last year	-0.001		-0.004	**	0.0003		0.002	
Population density	0.003		-0.013	*	-0.004		-0.006	
Constant	6.730		6.725		6.712		6.664	
R squared	0.312		0.307		0.301		0.301	

* significant at 5% ** significant at 1% *** significant at 0.1%

Results from area models are presented in Table 3. The top panels show models with area characteristics only, while the lower panels include household characteristics. The columns show the results of separate analyses for different standard geographies. These geographies range from the very small scale Output Areas (with an average population of just over 250), through the Postcode Sector (average population of around 6,000), Westminster Parliamentary Constituency (average population just over 90,000) to the rather larger Local Authority District (average population 140,000). Considering models with area variables only, there is a clear decline in the degrees of model fit (R-squared or the percent of variation explained by the model) as the geographic units become larger. However, even at the district level, three of the indicators (percentage unemployed, percentage professional and managers and in poor health) remain statistically significant. The one instance, population density, where an indicator is not significant at the smallest scale, it becomes so for the postcode sector level.

Once individual household characteristics are entered, associations with area characteristics tend to be weaker. However, many but not all of the indicators remain significant. The percentage of households headed by a professional or managerial worker remains strongly significant at all spatial scales. It should be noted that this area indicator does not have a household level counterpart. Other exploratory work suggests that including some measure of household socio-economic classification does reduce this somewhat, but does not remove the effect of the area component. At the larger scales this is the only area factor which remains significant.

Thus, as suggested above, we find much greater variation in household income when examining small scale than large scale units like local authorities or parliamentary constituencies. This is best explained by quite small scale neighbourhood sorting. We also find that neighbourhood characteristics have relatively weak effects on household income, independent of the characteristics of individual households. There is more work to do here to disentangle the main factors explaining income variation, and *Understanding Society* provides an ideal resource for examining these issues.

[1] The Carstairs score is a deprivation indicator based on four variables produced from the 2001 Census, the proportion of male unemployed, the proportion of overcrowded households, the proportion of households with no car/van ownership, and the proportion of persons of low social class. It is used because it can be computed straightforwardly for the whole sample

INTERACTIONS AND RESPONSE TO CONTEXTS

This section is concerned with individuals' or households' responses to the local environment, and makes use of the neighbourhood cohesion measure discussed earlier.

We explore the associations between social capital measures and individual and household characteristics. Residential stability is assessed at the individual level in terms of duration at the current address. Within the scope of this chapter we are only interested in presenting some associations rather than identifying effects. Analyses are presented in Tables 4 and 5. In Table 4, we show linear regression estimates of the relationship between sense of community/cohesion and individual-level covariates that characterise socio-economic and residential status as well as the Carstairs score[1] as a measure of LSOA-level deprivation. In Table 5, we display ordered logit estimates of some of the items included in the neighbourhood cohesion measure on the same set of covariates, selecting those items that are related to behaviours rather than attitudes and the results of logit regression of preferring to move on the same set of covariates.

Table 4 shows that sense of community is positively associated with age, being female and the number of children in the household. However, sense of community/cohesion is lower for highly educated people. Self-employed individuals have a greater sense of cohesion than those not economically active, but employment status is otherwise not associated with cohesion. Sense of community/cohesion does, therefore, not seem to be closely related to socio-economic status. In terms of residential status, sense of community/cohesion is higher for home owners and lower for private renters than social renters. This supports the idea that home owners have a vested interest in supporting the neighbourhood. Private renters often choose this tenure because they are expecting to move, which would explain that participation in neighbourhood life is lower for this group. As expected, sense of community/cohesion increases with duration of residence. It is also lower in urban areas than in rural neighbourhoods. The coefficient on the Carstairs score shows that even after controlling for individual-level characteristics of residents, sense of community/cohesion is lower in deprived neighbourhoods than in affluent ones.

Table 5 shows the association of sense of community or social capital measures with individual and household characteristics. Results are shown as proportional odds ratios. These measures of association show the increase in likelihood for a unit increase in the predictor variable, with values larger than one stating an increase, and values lower than one a decrease, in the likelihood of borrowing and exchanging favours, willingness to work with others to improve the neighbourhood and regularly talking with people in the neighbourhood respectively. The estimates show that, similar to the results obtained for sense of community, the likelihood of these behaviours generally increases with age, being female and the number of own children in the household, and it decreases for individuals living in urban areas.

Contrary to results for sense of community, those with a higher education are more likely to borrow and exchange favours and to be willing to work with others. A higher education reduces the likelihood to regularly stop and talk with neighbours. However, regarding the other covariates, these behavioural measures (borrowing things and exchanging favours as well as regularly stopping to talk with neighbours) have similar associations to those described for sense of community/cohesion: self-employment tends to increase the likelihood of the behaviour in question, as does the duration of residence, being a home owner, and living in an urban and living in a deprived neighbourhood, and being a private tenant reduces the likelihood. Being willing to work with others to improve the neighbourhood, on the other hand, is less likely for retired individuals but being self-employed has no statistically significant effect. Moreover, the duration of residence, being a private renter and the level of area deprivation as measured by the Carstairs score have no effect on the willingness to work with others to improve the neighbourhood. Thus the results show that, as the literature predicts, concentrated disadvantage decreases and residential stability increases these aspects of social capital or collective efficacy, but this is not true for all kinds of behaviour included in the measure of sense of community/cohesion.

Residents of urban neighbourhoods have a lower sense of cohesion, independent of their individual social characteristics

When looking at the associations between individual and area-level covariates and the various outcomes, we have used duration of residence at the current address as an independent variable. It is clear, however, that the duration of residence will in turn depend on many of the covariates used in the models. In other words, it is most likely an endogenous variable. In the right column of Table 5, we present the results for whether or not a respondent prefers to move house as a function of the same set of covariates as before. The estimates, again displayed in the form of odds ratios, show that older and retired individuals, home owners and those who have lived in a house for a long time, are less likely to want to move than others, whereas the likelihood of wanting to move increases with being self-employed, employed and unemployed, living in an urban neighbourhood, and with the deprivation of the neighbourhood. The results indicate that there are complex interactions between area deprivation, residential mobility and sense of community/cohesion which need careful consideration in terms of the direction of any causal effects.

Table 4 Individual and neighbourhood-level correlates of sense of community

	Regression coefficient
Individual level	
Age	0.08**
Female	0.67**
Number of own children in household	0.90**
Highest education: degree	-0.55**
Self-employed	0.52**
Employed	0.01
Unemployed	0.06
Retired	-0.26
Duration of residence	0.04**
Private renter	-0.61**
Home owner	0.54**
Neighbourhood level	
Urban neighbourhood	-1.22**
Carstair deprivation score	-0.08**
Constant	24.24**
Observations	16,914

Notes: *Understanding Society* Wave 1 Year 1, estimated on English, Welsh and Scottish sub-sample. Coefficients from linear regression; Omitted categories are male, other employment status, social renter, highest education lower than degree-level, rural neighbourhood.
** $p < .01$

Table 5 Association of individual and neighbourhood-level characteristics on aspects of social capital: Adjusted odds ratios

	Borrow things and exchange favours with neighbours[1]	Willing to work with others to improve neighbourhood[1]	Regularly stop and talk with people in neighbourhood[1]	Prefer to move house[2]
Individual level				
Age	1.00*	1.01**	1.02**	0.99**
Female	1.02	1.12**	1.31**	1.05+
Number of own children in household	1.34**	1.20**	1.27**	1.02
Highest education: degree	1.10**	1.21**	0.75**	0.96
Self-employed	1.18*	1.14+	1.26**	1.22**
Employed	0.98	1.06	0.96	1.11**
Unemployed	1.086	0.98	1.04	1.19*
Retired	0.89+	0.82**	0.98	0.80**
Duration of residence	1.01**	1.00	1.01**	1.00**
Private renter	0.84**	1.10	0.71**	1.01
Home owner	1.19**	1.29**	1.01	0.84**
Neighbourhood level				
Urban neighbourhood	0.70**	0.77**	0.68**	1.38**
Carstair deprivation score	0.96**	1.00	0.99*	1.05**
Observations	17,288	17,338	17,484	20,110

Notes: *Understanding Society* Wave 1 Year 1, estimated on English, Welsh and Scottish sub-sample. (1) odds ratios from ordered logit regressions; (2) odds ratios from logit regression. Omitted categories are male, other employment status, social renter, highest education lower than degree-level, rural neighbourhood.+p < .10, * $p < .05$, ** $p < .01$

LOOKING FORWARD

This chapter has provided some early findings from *Understanding Society* based on linking survey data to information about the areas in which participants live. It has focused on descriptive findings about the associations between individual characteristics and neighbourhood characteristics, and also about how individuals respond to their neighbourhoods. It has not explored whether these are 'neighbourhood effects' or are a consequence of population composition arising from the ways in which individuals choose to live in different areas. Nevertheless, it illustrates the very considerable potential of the study for further work in this area.

Sense of community is higher for women, older persons, and families with children, but lower for highly educated persons

Data collected at Wave 3 of *Understanding Society* will provide further opportunities for the study of neighbourhood interactions and their possible effects on outcomes. The module on local neighbourhoods at Wave 3 will contain a question battery on the standard of local services such as schools, shopping and leisure facilities and any problems with their accessibility. This will include questions on public transport. The questions used to assess sense of community/cohesion will be repeated at Wave 3. Additional questions on social cohesion, taken from the Project on Human Development in Chicago Neighbourhoods, are also in Wave 3. With the availability of more than one wave of *Understanding Society* data there will be the opportunity to study outcomes and their predictors over time. This may facilitate tackling some of the methodological issues associated with the study of neighbourhoods and their effects, for example by using panel models to control for unobserved individual heterogeneity.

Sample Size

The illustrative analyses are done with persons who responded to the adult individual interview (22,265), with some reduction associated with missing values on other variables. Some examples contrast the characteristics of individuals living in the highest and lowest areas in terms of material deprivation or 'green space'. The analysis of social cohesion uses data from the adult self-completion questionnaire.

Findings

When comparing residents of the areas with greatest to least material deprivation, those in less deprived areas are more likely to be unemployed, living in social housing, more likely to be members of minority groups, and more likely to want to move. The differences between areas with most and least green space are similar to those for material deprivation.

The association of individual and area characteristics were used to examine individuals' responses to where they live in terms of overall social cohesion and neighbouring behaviours. A stronger sense of community or social cohesion was found within women, by those who have more children, and for older persons. Three specific behaviours were borrowing things/exchanging favours, being willing to work with others to improve the neighbourhood, and regularly stopping to talk with people. In general, these behaviours have similar patterns of association to the sense of cohesion, but not for all variables. For example, greater education is associated with borrowing things and working with others on neighbourhood improvement but not with stopping to chat. So while concentrated disadvantage decreases some aspects of social capital, the pattern is not the same for all items included in the overall social cohesion measure.

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ENVIRONMENTAL ATTITUDES AND BEHAVIOUR: WHO CARES ABOUT CLIMATE CHANGE?

Peter Lynn | Simonetta Longhi

INTRODUCTION

Society faces significant environmental challenges including climate change, water quality and shortages, air pollution, and loss of biodiversity. Addressing these challenges will require understanding their roots in human behaviour. Simple technological solutions will not be sufficient, since efficiency-based improvements tend to be surpassed by changes in consumption.

This chapter pays most attention to the environmental challenge of climate change. In addition to scientific evidence that human activity is changing the environment in ways that will almost certainly bring about major shifts in the earth's climate, bringing seriously negative consequences for humans (Organisation for Economic Cooperation and Development, 2008a, 2008b), there is a need to better understand the beliefs and attitudes of members of the general population. Both the extent of the threat and the ability of society to adapt to changes will be determined by individual behaviour and by actions of governments and other organisations.

In this chapter, we provide an overview of some of the data from *Understanding Society* that will enable researchers to shed light on these issues and we discuss how the data could be used. We present preliminary analyses that demonstrate the extent of public knowledge, beliefs and so-called 'climate-friendly' behaviours. We also identify some of the socio-demographic factors that are associated with these behaviours. Finally, we point to additional uses of *Understanding Society* for future research.

THE DATA

The Wave 1 *Understanding Society* interview (n=22,265 in Year 1) included a set of questions relating specifically to behaviours that can affect the environment. For simplicity, we will refer to these as 'environmental behaviours', though we recognise that environmental concerns, or the lack of them, are not necessarily the drivers of these behaviours. Indeed, understanding the determinants of behaviour is an important research question which the *Understanding Society* data can be used to address. The behavioural questions covered several issues which, collectively, influence a considerable proportion of the greenhouse gas emissions and other resource use resulting from individual activity. These issues include travel behaviour, use of domestic fuel and purchase of recycled products. The battery of environmental behaviour questions is reproduced in Table 1. The Environmental Behaviours module can be seen in the Wave 1 questionnaire: **http://data.understandingsociety.org.uk/questionnaires/wave-1.** It should be noted that a number of other topics covered in the interview are also related to greenhouse gas emissions to some extent. These include questions on household expenditures on energy, whether considering installing alternative energy technology, recycling behaviour, and transportation items – some of which are unique to *Understanding Society*. These items are collected at the household level in the household questionnaire.

In addition to the behavioural questions, the adult self-completion questionnaire (n=19,168) included items on attitudes and beliefs regarding climate change. The attitude questions addressed attitudes to own behaviour, beliefs about the severity and imminence of climate change and beliefs about the efficacy of action to combat climate change. These questions are summarised in Table 2. Some of the questions are identical to ones carried on the 2007 and 2009 DEFRA surveys of public attitudes to the environment (Department for Environment, Food and Rural Affairs (DEFRA), 2007; Thornton, 2009).

Table 1 Behavioural questions related to carbon dioxide emissions

Question	Response Options
Please look at this card and tell me how often you do each of the following things:	Always; Very often; Quite often; Not very often; Never; Not applicable, Cannot do this
• Leave your TV on standby for the night	
• Switch off lights in rooms that aren't being used	
• Keep the tap running while you brush your teeth	
• Put more clothes on when you feel cold rather than putting the heating on or turning it up	
• Decide not to buy something because you feel it has too much packaging	
• Buy recycled paper products such as toilet paper or tissues	
• Take your own shopping bag when shopping	
• Use public transport (e.g. bus, train) rather than travel by car	
• Walk or cycle for short journeys less than 2 or 3 miles	
• Car share with others who need to make a similar journey	
• Take fewer flights when possible	

THE EXTENT OF ENVIRONMENTALLY-FRIENDLY BEHAVIOUR AND ATTITUDES

There are a number of theoretical frameworks for examining the relationship of attitudes and behaviours (Steg & Vlek, 2009). In the majority of frameworks, cognitions (beliefs) contribute to favourable or unfavourable attitudes, which, along with other influences, shape behaviour. This section shows the association of age category and educational qualifications for a variety of behaviours and attitudes.

Focusing attention only on the total column of Table 3, we found that a majority of respondents claimed to engage in a number of behaviours that, for simplicity, we shall refer to as 'environmentally-friendly'. For example, between one half and two thirds of all respondents reported that they never leave the TV on standby overnight (58%), always switch off lights in rooms that are not in use (63%) or always or very often take their own shopping bag when shopping (63%). And even regarding transport choices, where the costs and disadvantages of environmentally-friendly behaviours may be perceived as more considerable, fully 39% of respondents claim to use public transport rather than travel by car 'quite often', 'very often' or 'always', while 60% walk or cycle for short journeys, of whom two thirds (40% of all adults) claim to do this 'always' or 'very often'. Overall, just over half the respondents (53%) say they 'do quite a few things that are environmentally-friendly' or are 'environmentally-friendly in most things or everything' they do. (See Table 2 for the full wording of this question.)

Regarding attitudes to climate change, we find that 60% believe that if things continue on their current course, we will soon experience a major environmental disaster, while only one in five (21%) think that it is too late to do anything about climate change and less than a third (29%) believe it is not worth Britain trying to combat climate change, because other countries will just cancel out what we do. These figures would seem to suggest considerable agreement with the ideas that climate change is serious and that something can be done about it. However, well over half the respondents (59%) agree that 'any changes I make to help the environment need to fit in with my lifestyle' and only half (50%) would be prepared to pay more for environmentally-friendly products. This suggests widespread reluctance to take action that has a personal cost (not necessarily monetary), a suggestion that is in line with previous research findings for the UK (e.g. Anable, Lane & Kelay, 2006; King et al, 2009) and Germany (Diekmann & Preisendörfer, 2003). The latter conclude that pro-environmental attitudes influence pro-environmental behaviour only in low-cost situations.

These findings imply that willingness to behave in environmentally-friendly ways does not match up to the apparent recognition of the need to tackle climate change. In addition, a sizeable minority express scepticism regarding the likely efficacy of climate-friendly behaviour.

Table 2 Questions on attitudes and beliefs regarding climate change

Question	Response options
Which of these best describes how you feel about your current lifestyle and the environment?	I'm happy with what I do at the moment; I'd like to do a bit more to help the environment; I'd like to do a lot more to help the environment
And which of these would you say best describes your current lifestyle?	I don't really do anything that is environmentally-friendly; I do one or two things that are environmentally-friendly; I do quite a few things that are environmentally-friendly; I'm environmentally-friendly in most things I do; I'm environmentally-friendly in everything I do
Do you agree or disagree that being green is an alternative lifestyle, it's not for the majority?	Agree strongly; Agree; Disagree; Disagree strongly
Please tick whether, on the whole, you personally believe or do not believe each of the following statements: I don't believe my behaviour and everyday lifestyle contribute to climate change; I would be prepared to pay more for environmentally-friendly products; If things continue on their current course, we will soon experience a major environmental disaster; The so-called 'environmental crisis' facing humanity has been greatly exaggerated; Climate change is beyond control – it's too late to do anything about it; The effects of climate change are too far in the future to really worry me; Any changes I make to help the environment need to fit in with my lifestyle; It's not worth me doing things to help the environment if others don't do the same; It's not worth Britain trying to combat climate change, because other countries will just cancel out what we do; People in the UK will be affected by climate change in the next 30 years; People in the UK will be affected by climate change in the next 200 years.	Yes, I believe this; No, I do not believe this

FACTORS ASSOCIATED WITH ENVIRONMENTALLY-FRIENDLY BEHAVIOURS

In this section we examine some of the socio-demographic factors associated with the environmentally-friendly behaviours reported by *Understanding Society* respondents. In the UK, surveys have found little association between behaviours undertaken for 'green' reasons and socio-demographic characteristics (e.g. DEFRA, 2010; Thornton, 2009). Evidence for the US suggests that pro-environmental behaviours correlate with age, gender, religiosity and race. (See e.g. Stern, Dietz & Kalof, 1993; Johnson, Bowker & Cordell, 2004; Franzen & Meyer, 2010), though most of these studies are based on rather small samples.

Table 3 summarises the relationship of the eleven environmental behaviour items with age and with level of education. Age and education are chosen for this analysis as both can be expected on theoretical grounds to be related to environmental awareness and both have been shown in previous studies to be associated with environmental attitudes (e.g. DEFRA, 2010; Hirsh, 2010; Mobley, Vagias & DeWard, 2010). In addition to the behaviour items, we also examine the item regarding the extent to which the respondent believes their behaviour to be environmentally-friendly. It can be seen that there are considerable differences in reported behaviour between subgroups. For six of the eleven items, older people are more likely than younger people to report environmentally-friendly behaviours. The exceptions are: putting on more clothes rather than turning the heating up, and taking fewer flights – for which there are no differences between age groups – and the three items relating to ground transport behaviour. For these latter three items, respondents aged 16 to 25 are considerably more likely than their older counterparts to report environmentally-friendly behaviour, namely using public transport rather than a car, walking or cycling, and car-sharing.

Respondents with degree-level qualifications are more likely to buy recycled products but less likely to use public transport rather than travel by car

Respondents with degree-level qualifications are more likely than others to report buying recycled paper products, not purchasing over-packaged items, avoiding turning the heating up, and turning off the tap while brushing their teeth. However, they are less likely to turn the TV off overnight, to switch off lights in unused rooms and to use public transport rather than travel by car. The remaining behaviours are not related to level of education.

These findings offer an interesting suggestion that more highly-educated people may be more willing to take

Table 3 Association of environmentally-friendly behaviour with age and qualifications

	Age			Qualifications		
	16-25 %	26-50 %	> 50 %	No degree %	Degree %	Total %
Leave TV on standby - never	49*	55	63*	59	53*	58
Switch off lights – always	49*	61	68*	65	54*	63
Keep tap running – never	33*	39	41*	38	42*	39
Avoid turning heating up – AVO	51	50	51	49	54*	50
Not purchasing over-packaged items - ever	33*	47	44	40	57*	44
Buy recycled paper products – AVO	18*	25	28*	24	32*	26
Take own shopping bag – AVO	33*	58	78*	62	64	63
Public transport rather than car – AVO	46*	22	26*	28	25*	27
Walk or cycle for short journeys – AVO	52*	40	36*	40	40	40
Car share – AVO	30*	15	11*	16	14	15
Fewer flights – AVO	17	16	14	14	18	15
Environmentally-friendly in most things or everything	8*	12	24*	16	16	16

Notes: Responses of 'not applicable/cannot do this' have been excluded from the base for estimation. For most items, these account for less than 5% of responses. The exceptions are the 'car share' and 'fewer flights' items, where such responses account for 25% and 41% of responses, respectively. The final item in the table is taken from the self-completion questionnaire, for which valid n=17,265; all other items are from the individual interview (n=22,265). 'AVO' = always or very often. Design-weighted estimates. * indicates significantly different (P<0.05) from reference category, which is age 26-50 or no degree

environmentally-motivated principled actions such as buying recycled paper products or avoiding the purchase of over-packaged products and yet are less willing than others to take relatively small actions that may be more of a personal inconvenience.

The findings are also illustrative of the hypothesis that much of the variation in levels of environmentally-friendly behaviour is driven by factors other than environmental concern. For example, the fact that young adults report more environmentally-friendly travel behaviour may be explained by limited access to private transport amongst that age group. More generally, income and personal resources are likely to be important drivers of behaviours (King et al, 2009). The various possible explanations of observed differences in levels of environmental behaviours deserve deeper investigation. The *Understanding Society* data offer huge potential for such investigation.

To illustrate how one might begin to better identify the associations between reported behaviours and socio-demographic characteristics, we present separate models of the factors associated with each of three types of behaviour: being prepared to pay more for environmentally-friendly products, putting on more clothes rather than turning the heating up, and taking fewer flights when possible. We chose these three behaviours as they appear to represent a range of implications in terms of the imposition on the actor and in terms of the likely nature of any confounding with financial circumstances. Specifically, we expect that being prepared to pay more for environmentally-friendly products is an action easier to take for people on higher incomes, while tending to put on more clothes rather than turning the heating up is an action more likely to be undertaken for non-environmental reasons by people on lower incomes. However, teasing out different motivations for behaviour and identifying the role of income must remain tasks for future studies. Our aim here is primarily to illustrate the potential of the data and to gain some initial insight into the ways in which behaviour is related to socio-demographic characteristics. Future research can explore whether similar socio-demographic influences are in operation for other behaviours, for example different indices of travel behaviour.

Our three dependent variables are all dichotomous. The item about being prepared to pay more for environmentally-

Table 4 Association of socio-demographic characteristics with behaviours and attitudes

	Prepared to pay more for environmentally friendly products	Always put on more clothes when cold rather than turn up heating	Always or very often reduce the frequency of flights
Age	0.003*** (0.000)	0.001*** (0.000)	-0.000 (0.000)
Female	0.039*** (0.009)	0.019** (0.007)	-0.007 (0.007)
Married	0.007 (0.009)	-0.029*** (0.006)	-0.011* (0.007)
Dependent children	-0.058*** (0.012)	-0.011 (0.009)	0.017 (0.010)
Education level (reference: no qualifications)			
Degree	0.253*** (0.011)	0.013 (0.010)	0.068*** (0.011)
Diploma, teaching, nursing	0.108*** (0.015)	0.023 (0.012)	0.044** (0.014)
A, AS Level	0.112*** (0.016)	0.022 (0.013)	0.074*** (0.016)
Lower qualifications	0.031** (0.011)	0.003 (0.008)	0.031** (0.010)
Economic activity (reference: inactive)			
Employed	-0.017 (0.009)	-0.025*** (0.007)	-0.021** (0.007)
Unemployed	-0.031* (0.019)	0.055*** (0.014)	0.011 (0.016)
Self-employed	-0.009 (0.017)	-0.005 (0.013)	-0.022 (0.011)
Observations	**16,251**	**22,048**	**13,077**

Marginal effects of probit models; standard errors in parenthesis. * 0.05>p>0.01, ** 0.01>p>0.001 *** 0.001>p

Women are more likely to put on more clothes when cold and to pay more for environmentally-friendly products

friendly products had only two response options, but the other two items each had more options so we have derived our own dichotomy. For putting on more clothes rather than turning up the heating we contrast those who answer 'always' with those who give any of the other answers (1 = always; 0 = all other answers). For the frequency of taking fewer flights, we compare those answering that they adopt this behaviour always or very often to those who give any other possible answer (1 = always or very often; 0 = all other answers). Thus, in both cases we are isolating relatively extreme environmentally-friendly behaviour. The overall proportions reporting each of these environmentally-friendly behaviours were 50% for being willing to pay more, 27% for always putting on more clothes, and 15% for always or very often taking fewer flights.

For each of these variables we estimated a probit model to analyse whether people with different individual and household characteristics had systematically different behaviours. The individual and household characteristics and the model estimates of their relationship with the environmental behaviours and attitudes are listed in Table 4. A probit model is used for the statistical analysis of outcomes with two alternatives, e.g. putting on more clothes vs. turning up the heat. The results are expressed in terms of marginal effect or the amount by which the predicted probability of putting on more clothes changes when the predictor variable changes by one unit. For example, the effect of 0.039 indicated in the first column for females means that women are 3.9% more likely than men, all other factors being equal, to be prepared to pay more for environmentally-friendly products.

For two of the three behaviours studied here (paying more for environmentally-friendly products and putting on more clothes when cold), the model estimates suggest that women are more likely than men to adopt pro-environmental behaviours, and that pro-environmental behaviour increases with age. This is consistent with some previous findings (Stern et al., 1993; Johnson et al., 2004; Franzen & Meyer, 2010).

Married or cohabiting people are less likely to put on more clothes when cold; while the presence of dependent children in the household is associated with a lower willingness to pay more for environmentally-friendly products.

People with higher levels of education seem more likely to adopt pro-environmental behaviours, at least in terms of paying more for environmentally-friendly products and taking fewer flights. Potential explanations for these associations – worthy of further study – include greater awareness of environmental problems and the effect of education on income and hence ability to pay. The association is particularly strong in the case of willingness to pay more for products: people with degrees are 25 percentage points more likely to be willing to do so, on average, than people with no educational qualifications.

On the other hand, being in employment is associated with a reduced likelihood of adopting pro-environmental behaviours – especially putting on more clothes when cold and reducing the frequency of flights. Unemployed people are the most likely to put on more clothes when cold rather than turning up the heating and the least likely to be willing to pay more for environmentally-friendly products – maybe in order to minimise expenditure.

RESEARCH POTENTIAL

The current intention is that the questions highlighted in this chapter - on environmental behaviour and beliefs - will be included on *Understanding Society* for the entire sample at every third wave, i.e. at Waves 1, 4, 7, and so on. These data will provide considerable research potential. Key research questions concern the motivations for behaviours. In time, when multiple waves of the survey have been carried out, it will be possible to identify changes in behaviours and attitudes – not just population-level trends, but at the individual level. It will be possible to establish the circumstances in which people change their attitudes or behaviours, the types of people most likely to do so, and the relationship of these changes to other events in people's lives. Understanding the temporal context of changes will bring us closer to a causal understanding of the drivers of environmental behaviours and beliefs. In due course, with longitudinal data, we will also be better able to test hypotheses about alternative motivations for reported behaviour, in particular teasing out the effects of education as a motivator and of income as a constraint.

It will also be possible to tease out the correlations between the different types of behaviour and the different dimensions of attitudes. Researchers will be interested to find out which behaviours occur together, for which types of people, and in which circumstances. The unusually large sample size of *Understanding Society* will enable researchers to estimate the effects on environmental behaviours of relatively rare attributes and to study relatively unusual combinations of behaviours and attitudes.

One important area for future research concerns the inter-relationships of behaviours. Potential approaches could use Rasch or factor analyses to examine the dimensions of environmental behaviour (Kaiser, 1998). Alternatively, interdisciplinary research with environmental scientists could attempt to calculate the energy effects of multiple behaviours performed by an individual or household. This is analogous to research that has transformed specific physical activities, e.g. swimming for 30 minutes, into units

called Metabolic Equivalent Tasks (METs) (Ainsworth et al., 2000). In such research, direct measures of environmental effects, e.g. energy use as assessed by meter reading or energy bills, will be mapped to survey responses. The ability to characterise a packet of behavioural practices would be useful in determining intervention targets and in weighing the effects of different behavioural targets.

The wide range of content available in *Understanding Society* is important for future contributions to research related to environmental attitudes and behaviour. In addition, researchers will be able to make use of geographic linkages to combine objective measures of environmental conditions, such as amount of green space to measures of psychological well-being and leisure activities. The wide range of content is also particularly important for understanding the factors associated with attitudes and behaviour – e.g. the resources available to households, the opportunities and constraints they face (e.g. in relation to location of residence). Over time, changes in these circumstances, such as change in income level, may give us a better handle on the relationship between income and environmental behaviours than cross-sectional levels which may be confounded with other factors.

A further dimension that we have not considered in this chapter is the nature of intra-household dynamics. Many of the behavioural choices measured in the survey are likely to be influenced or constrained by other household members. Attitudes too may be influenced by others. As all adult members of each household are asked the same questions about environmental behaviour and beliefs on the same occasions, *Understanding Society* data will enable detailed study of these dynamics and of the role that other household members play in shaping personal behaviour. Households offer an important context for observing changes in environmental attitudes and behaviours over the lifecycle. Will the age relationships observed in this chapter at a single point in time be apparent in persons as they advance in age? What will be the effect of moving from a childless household to one with young children? Do people become more oriented toward the future or do additional demands for consumption dominate? As climate change takes effect and its impacts become more obvious, do households change their behaviour in an attempt to mitigate any further shift?

In summary, we believe that the *Understanding Society* data will prove to be of immense value to researchers who seek to extend understanding of the dynamic processes associated with attitudes towards environmental issues and with personal behaviours that have potential impacts upon the environment. We encourage researchers to make good use of the data.

Sample Size

Analyses of environmental behaviours are conducted with individuals who completed the individual adult interview (22,265), with some reduction for missing data for items. Responses of not applicable or cannot do this were excluded. This response choice is less than 5% for most environmental behaviour items except for sharing a car (25%) and taking fewer flights (41%). Analyses of environmental attitudes, such as appraisal of being environmentally-friendly or willingness to pay more for environmentally-friendly products, are conducted with data from the adult self-completion questionnaire (19,168), with reduction for missing data for individual items. Estimates are weighted to account for the survey design.

Findings

There is an association of age and many environmental behaviours. Older persons are more likely to not leave TVs on standby, switch off lights, take shopping bags to the shops, and take account of amount of packaging and recycling in purchases. Younger persons are more likely to cycle or walk for trips of 2-3 miles, take public transport and share a car.

Only 16% of people view themselves as environmentally-friendly in most or all things they do. This increases to 24% among those aged 50 or older.

We have a more detailed examination of three behaviours: being willing to spend more for environmentally-friendly products (50%), always putting on more clothes when cold rather than turning up the heat (27%), and reducing the frequency of flights at least very often (15%). People with higher education are more likely to pay more for products and to cut back on flying. Women are more willing to pay more for products and to put on more clothes rather than turn up the thermostat. These behaviours also increase with age.

Only 16% of people view themselves as environmentally-friendly in most or all things they do

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USING EXPERIMENTS TO GUIDE DECISION MAKING IN *UNDERSTANDING SOCIETY:* INTRODUCING THE INNOVATION PANEL

S. C. Noah Uhrig

INTRODUCTION

Longitudinal studies present particular methodological issues for those who design and conduct them. The aims in designing a questionnaire extend those of cross-sectional surveys, from ensuring that the questions are understood clearly by those taking part and producing reliable estimates to the accurate measurement of change. Gaining a high response rate and making people feel valued members of the study are key objectives for any survey, but for longitudinal studies these activities must be sustained to minimise attrition or drop out over time. The long-term quality of the study as a whole is damaged if people drop out over time because they find the survey process too burdensome.

Understanding Society has a strong commitment to innovation in panel data collection methodology. The Innovation Panel (IP) is designed explicitly to enable methodological research into the best ways of asking questions and conducting fieldwork operations. This chapter describes the design of the *Understanding Society* IP. It then summarises experimental and non-experimental studies conducted as part of the first two waves.

The use of the IP to guide design, content and survey procedures of the *Understanding Society* main study is illustrated with two example case studies. The first example tests different methods of measuring household consumption and expenditure. Data resulting from three different measurement strategies were validated against measures obtained using diary methods. The resulting decision balanced data about measurement quality with information regarding the feasibility and costs of measurement strategies. Balancing the results of this work with both feasibility and cost implications of each design, a decision was taken about how to most efficiently collect reasonably valid and reliable data about household consumption. The second case study concerned the effects of survey procedures on response. An experiment examined the format of materials sent in advance to respondents to encourage them to participate in this new and exciting project. With largely equivalent results, decisions about the entire suite of materials designed to communicate with respondents about the survey were based on feasibility and survey logistics. The chapter concludes with a brief discussion of the role the IP will play in the future of *Understanding Society*.

THE DESIGN OF THE INNOVATION PANEL

The IP is comprised of a sample and survey instrument separate to the main *Understanding Society* sample. The IP sample was recruited using a stratified and geographically clustered sample design. The primary sampling units (PSUs) were post-code sectors. In total, 2,760 addresses in 120 areas of Great Britain were selected from the small user Postcode Address File. The region north of the Caledonian Canal and Northern Ireland were excluded from sampling, whereas the main sample includes these areas. All household members of residential addresses aged 16 years or older are eligible for interview. As with the main stage fieldwork design, all persons resident at the address, including children, are defined as original sample members to be followed throughout the life of the study. In contrast to the main general population sample, the IP does not attach absent household members living in institutional accommodation to the IP sampled households. This introduces some degree of coverage error, since these persons do not otherwise have an independent chance of selection through the Postcode Address File. Despite these differences, the IP has many similarities to the overall sample design of *Understanding Society*.

Interviewing for IP Wave 1 took place between in January and April 2008 and resulted in achieved interviews in 1,489 households. Thus, the household response rate was 59.5 percent, not counting ineligible addresses. Fieldwork achieved a total of 2,393 individual interviews. The collection of IP Wave 2 occurred in March 2009. Interviews were conducted in 1,122 households including approximately 72 new ones due to splits from original sampled households. Including full, partial or proxy interviews, IP Wave 2 data was gathered for 1,870 individuals. Since response is one of the critical outcomes relevant for innovation research, future waves of the IP will undoubtedly involve refreshment samples, which will provide further methodological research opportunities.

The IP shares the same basic interview structure as the main survey. This includes a household roster and household questionnaire, individual questionnaire, a youth self-completion instrument and a proxy for any respondents who could not be interviewed in person when the interviewer called. Where possible, the IP questionnaires mirror the content and interview length of the main sample.

IP Wave 1 was conducted by face-to-face interviews using computer assisted personal interviewing (CAPI), while IP Wave 2 experimented with a mixed-mode design in which a portion of the sample was interviewed via telephone using computer assisted telephone interviewing (CATI). In CAPI, the questionnaire is a computer programme, in which the computer shows the questions on the screen and the interviewer reads them to the respondent and records the respondent's answers. CATI is the same but with the interview taking place over the telephone.

Understanding Society is committed to examining and employing new methods of data collection in longitudinal studies. This includes the incorporation of qualitative and visual data, external data linkage of data from administrative sources, web-based data collection but also event history calendars and diary data. With an event history calendar, the respondent records dates important to them. These landmark dates are then used to help respondents recall and date events relevant to the survey (Belli, Shay & Stafford, 2001). Future work with the IP will undoubtedly experiment with these methods as well.

THE IP INFORMS DECISIONS ON SURVEY CONTENT

Best practice in the design and instrumentation in survey research should be based on empirical evidence. Such empirical evidence has been difficult to obtain for longitudinal studies, which are expensive to field and can result in quite complicated data to unravel. For these reasons, there are many unanswered questions concerning the survey procedures best suited to secure response rates and maintain sample representativeness in longitudinal surveys. How much incentive and what form of incentive generate the best whole household and individual response rates? What sorts of communications in advance of fieldwork are best? What mixed mode design is most efficient and secures a relatively unbiased sample? IP Waves 1 and 2 focused on these issues, with a view towards decision making on the main stage of *Understanding Society*.

Many questions also remain concerning the measurement properties of survey questions carried in longitudinal studies. To what extent do visual cues affect measures of stability and change in panel studies? To what extent are cross-sectional response effects reproduced when measures are repeated over multiple waves in a panel? What types of measures are affected by the on-going participation of survey respondents and to what extent does this affect response accuracy? IP Waves 1 and 2 have also addressed these issues with a focus on informing data analysis and end users of *Understanding Society* data.

Table 1 outlines the experiments carried in IP Waves 1 and 2. Work has focused both on measurement of concepts and on the effects of survey procedures as they influence measurement and response. Work in future waves is expected to begin unravelling the uniqueness of panel designs for understanding survey response processes. Two examples from IP Waves 1 and 2 show how empirical evidence can be used in conjunction with information about feasibility and costs concerns in survey research decision making.

THE CASE OF MEASURING HOUSEHOLD EXPENDITURE

One initial concern for *Understanding Society* main stage development was the measurement of household consumption and expenditure. As a general purpose survey, *Understanding Society* cannot always afford large amounts of questionnaire time to any single topic or theme on a regular basis, although it intends to devote considerable detail to various topics at fixed intervals over time. Household consumption and expenditure is one such topic where other surveys, such as the Living Costs and Food module of the Integrated Household Survey (Office for National Statistics, 2010), may be better placed to provide population level estimates. Yet, longitudinal data on household consumption is simply non-existent, and this lack of data has been a binding constraint in many areas of current research in both the UK and internationally (Browning, Crossley & Weber, 2003; Attanasio et al., 2006). While a number of methods have been employed in various other surveys, no clear cut, efficient and robust measurement protocol existed that could efficiently gather the relevant expenditure data required for analysis. Indeed, Browning et al. believe 'that the most accurate recall based measure of total expenditure will be derived from asking about an exhaustive list of highly disaggregated expenditure items. This is, however, a counsel of perfection that few general purpose surveys can afford' (2003, p560).

Table 1 Topics list of experiments carried in the *Understanding Society* IP, Waves 1 and 2

IP Wave 1	*IP Wave 2*
Incentives and response	Incentives and response
Measurement of household consumption	Measurement of change
Measurement of labour market status	Measurement of identity
Measurement of job satisfaction	Measurement of job and life satisfaction
Random sub-setting of questionnaire content (partnership and fertility histories, environmental attitudes and self-reported height and weight)	Exploitation of random sub-setting to examining panel conditioning
Enumeration of unearned income and benefit sources	Mixed-modes protocols (response and measurement effects)
Measurement of personal consumption	Respondent communication (advance cards vs advance letters)
	Use of visual cues

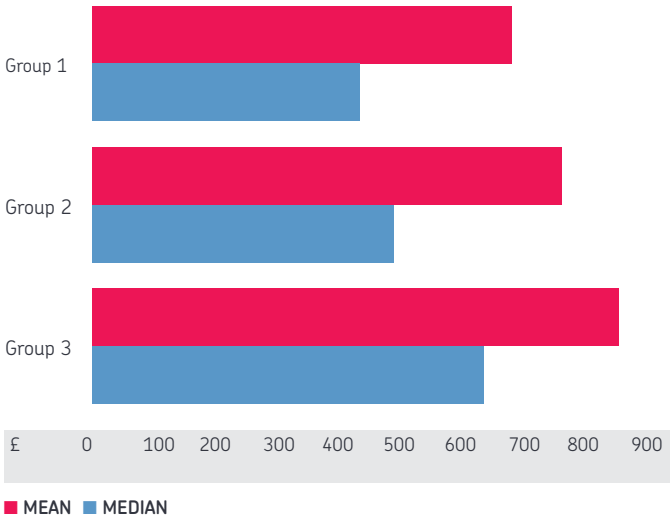
IP Wave 1 experimented with different measurement designs, intending to develop parsimonious questions to gather reasonable data with workable measurement properties. The focus was on four key areas: household level food expenditure in the home; household level food expenditure out of the home; household level total non-durable expenditure; and personal expenditure on various items.

The household experiments concerned household level expenditure questions about food consumption and non-durable expenditure. The household reference person was asked to provide information on expenditure for the household overall. The aim of the experiment was to evaluate the extent to which cues concerning what to include and exclude influenced the total amounts reported. The period over which respondents reported in each treatment group was the prior month. A personal expenditure experiment was also carried, though the aim of that experiment was to evaluate whether reporting for a 'usual' month as opposed to 'last' month resulted in estimates closer to expectation. This chapter discusses only the findings from the household level consumption experiment.

Households were randomly assigned into one of three treatment groups. This is called a randomised or split ballot experiment. The Appendix contains the questions used in each of the three treatments. Respondents in the first treatment group were asked to provide the total amount of household expenditure excluding housing costs and utility bills. The second treatment asked for the same overall total amount, but the question included cues about what should be included, such as food eaten inside and outside the home, alcohol and tobacco, clothing and footwear for all household members, etc. The third experimental treatment was most explicit about what respondents should include or exclude in their reporting. This treatment asked respondents a series of questions about levels of expenditure in each of a number of specific areas. Respondents were first asked for expenditure on food and groceries from a grocery store. They were then asked how much of that sum was for non-food items. Next, respondents were asked for expenditure at places other than grocery stores. And lastly, the questionnaire asked respondents for their household expenditure in specific areas including: alcohol and tobacco; clothing and footwear; prescriptions and health expenses; public transport costs; telephone, landline, mobile and internet; and entertainment, leisure and hobbies. Thus, the three randomly assigned treatments varied in the use of cues of what to include or exclude in reporting.

Bottazzi, Crossley & O'dea (2008) evaluated the data collected from the three experimental treatments. They found that indicators of data quality for all three treatments were good. Item non-response, though generally low throughout the questionnaire, remained relatively low with regard to all three sets of consumption questions. Notably, less than 10 percent of responding households had missing data across the items. Even the third experimental treatment group provided estimates of total expenditure for 88 percent of households and food-at-home expenditure for 93 percent. These item non-response rates were similar to other surveys measuring consumption with similar items (Bottazzi et al., 2008).

Figure 1 Mean and median expenditure across three experimental treatment groups (no cues, minimal cues, and extensive cues)



As shown in Figure 1, the mean and median values for total expenditure obtained for each of the three treatment groups varied in expected directions. Notably, including the 16 cues in the total expenditure resulted in both higher mean and median expenditure (group 2 versus group 1), though these differences were not statistically significant. Treatment 1 had a mean expenditure of £674 and a median of £450 compared to a mean of £749 and median of £500 for treatment 2 with the extended cues. The series of expenditure items yielded the highest mean (£826) and median (£630) total expenditure. These figures for treatment 3 were significantly different from either of the first experimental groups.

To evaluate the validity of the measures, Bottazzi and associates (2008) then compared data from the IP experimentation to data obtained from the Expenditure and Food Survey (EFS) which uses a diary approach (Office for National Statistics, 2009). The main problem this validation work identified was an under-reporting in the IP data relative to the EFS in terms of total expenditure across all three treatment groups. Notably, the first two treatment groups captured only 50 to 60 percent of the total expenditure in the EFS. The sequence of questions used in the third treatment was slightly better, resulting in a derived total expenditure measure that was on average 67 to 69 percent of the EFS.

They further compared the more detailed categories of expenditure captured in treatment group 3. There were some limitations in their ability to make the categorical comparisons. The expenditure categories used in the EFS did not match the categorisation used in the IP. They also noted that the EFS used weights to obtain population representativeness while the IP had no weights at the time of their analysis. Despite these caveats, they found that the results for food expenditure for treatment group 3 were similar between the IP and the EFS, suggesting high construct validity. They also found that the proportion of household expenditure across certain areas were reasonably similar between the studies. The relationship between household income and reported expenditure was also similar in the two surveys. Key differences were in areas where expenditure categories could not be matched directly between the surveys. This validation study suggested that the approach taken in treatment group 3 would yield the most accurate data.

The interview running time must be balanced against non-response and other indicators of reliability and validity when determining which measures to include in any general purpose survey. The interviewing times for the first two treatment groups were not significantly different from one another, however the administration time for the third treatment group was a statistically significant 2 minutes longer. Given that the target running time of the *Understanding Society* household questionnaire is 10 minutes, adding 20% to its length to obtain a single measure is a major and costly decision.

Based on lessons learned from this analysis, questions were selected for the household expenditure measures for *Understanding Society*. The decision taken was to concentrate on a specific area of household consumption only. The final set of consumption items used in the main stage questionnaire focus on food for home consumption, food outside the home, and alcohol purchases. Utilities and housing costs are captured elsewhere in the study. The remaining expenditure questions examined in IP Wave 1 were retained for further testing and potential use at later waves.

AN EXPERIMENT WITH ADVANCE MATERIALS

An experiment carried in IP Wave 2 asked whether the form of respondent communication was associated with household and individual response rates. Respondent correspondence can vary in format and certain types of formats may vary significantly in look and feel, even though the information provided in the material remains the same. The format of respondent correspondence may have important consequences on response to the survey (Traugott, Groves & Lepkowski, 1987; Link & Mokdad, 2005). For example, a formal letter may convey a feeling of authenticity or authoritativeness, whereas a bi-fold card may convey a feeling of friendliness, particularly if it includes some sort of graphic design. Such subtle influences may have important effects on response.

The advance materials experiment carried at IP Wave 2 compared a mailing in the form of a greeting card to a formal letter on printed letterhead stationery. The correspondence was sent to adults or rising adults interviewed in IP Wave 1. The cards and letters were equated on length, text, incentives, and information related to study legitimacy. Both provided an identical assurance of data privacy. Although the envelopes for both cards and letters were personally addressed, the letter was also personally addressed internally. Differences between the treatments were in terms of appearance and format only. The outcomes of interest were both household and individual response. Households were randomly assigned to receive cards (n=781) or letters (n=785).

Of particular concern were both household and individual level non-contact rates and refusal rates, given contact at IP Wave 1. Among eligible households, 3.8% of the letter group and 3.0% of the card group were not contacted. Among contacted eligible households, 18.6% of the letter group and 16.8% of the card group refused. For individual level outcomes, non-contact rates were comparable and not significantly different across both types of advance materials (1.2% letter, 1.1% card). Moreover, refusal rates did not vary significantly between the two forms of correspondence (5.3% letter, 4.8% card). Despite the lack of significant differences across the forms of individual level correspondence in non-contact and refusal rates, the letter did seem to consistently perform more poorly than the card. It should be noted that only a significant interaction effect with region was found. Specifically, in Scotland, 14.6% of persons receiving letters refused an interview, vs. 3.1% getting the card.

For Wave 2 of the main stage of *Understanding Society*, a decision was taken to use formal letters rather than cards. The letter is more flexible to personalise and less costly to produce than a card and the evidence showed that the two formats had similar rates of response. This decision resulted in cost savings in the main study, while not impacting on the quality of the study. From Wave 2 onwards, respondents will be sent an advanced mailing tailored in content based on their interview outcome at the previous wave and their sample status at the current wave. All communication with respondents will be personalised with their name. Continuing respondents will receive one type of personalised mailing, respondents who did not participate in the prior wave will receive a different mailing, and 16 year-olds, newly eligible for an adult interview at the current wave, will get a third tailored letter inviting them to participate. In terms of feasibility, this level of personalisation of greeting cards could not be technically obtained for the costs available.

THE INNOVATION PANEL – INTO THE FUTURE

The initial waves of the IP have been dominated by design and implementation matters relevant for the development of the main stage *Understanding Society* sample. However, given the commitment to innovative methodology, including new modes of data collection, the collection of qualitative and visual data, and external record linkage, the IP is well placed to be a vehicle for developing a wide range of data types and tailoring data collection methods which attend more closely to the circumstances of individual respondents. On-going and long-running panels still face many unanswered questions about how best to update content and measures to reflect the changing nature of social conditions. In future, one can imagine not only exploring key methodological issues in innovative data collection but also examining questions of measurement which plague on-going and long-running panels.

With no difference in response to advance cards and letters, we chose letters, which are more flexible and less costly

From IP Wave 3 onwards, the IP will become a resource for survey methodologists and other interested researchers. There will be an open competition in which researchers can propose an experiment or set of experiments for inclusion on the IP with no cost to the proposer for data collection. The proposals will be considered by a panel which selects projects for inclusion. Several features will contribute to a more positive evaluation of proposals for adoption. One of the strongest criteria is the proposal's contribution to methods for longitudinal surveys. Topics which may be viewed as inherently relevant to longitudinal surveys include those concerning attrition, panel conditioning or measurement error in identifying and detailing change in circumstances. Panel conditioning is a form of measurement error in which previous participation in a longitudinal survey influences respondents' reports (Bailar, 1989).

Proposals may also take advantage of information derived from the panel context, for example micro-level paradata gathered at one wave could inform and determine procedures for data collection at subsequent waves. Paradata is information about the process of data collection (Laflamme, Maydan & Miller, 2008). Proposals which draw on the strengths of the household design will also be particularly favoured. Using a panel survey to gather longitudinal data is expensive and there is significant uncertainty about best practices within longitudinal research, which the *Understanding Society* IP can be used to address. The IP is a valuable resource for answering methodological questions in social science.

The IP has directly affected the design and content of *Understanding Society*. Now that the main *Understanding Society* study is going into its third year of data collection, and reliance on the IP for design and content decisions by *Understanding Society* principal investigators has lessened, the IP is now open to survey methodologists for their own research purposes. In this regard, the IP is developing into a resource for the research community as a whole.

Sample Size

The Innovation Panel has an equal probability sample of addresses in 120 areas (PSUs) across Britain, south of the Caledonian Canal. The analyses reported in this chapter were conducted with approximately 1500 households interviewed in Wave 1.

Findings

The Innovation Panel is designed to support methodological research into the best ways of asking questions and conducting fieldwork operations. This chapter presents two case studies of the use of experiments to address questions about measurement and survey procedures. The first example tests different methods of measuring household consumption and expenditure and compares them to estimates obtained using diary methods. The second case study assessed the effect on response of two formats for materials sent in advance to respondents to encourage them to participate.

In Wave 1 of the IP, households were randomly assigned to different versions of measures for household consumption that varied in the use of cues of what to include or exclude in reporting. Asking about consumption as a series of questions resulted in significantly higher mean and median expenditures, while providing multiple cues or reminders of what to include was associated with higher estimates of expenditures than a simple question, though the difference was not statistically significant. Comparisons with the Expenditure and Food Survey showed similar results to the more detailed set of questions, particularly for food expenditures. The questions selected for *Understanding Society* concentrated on expenditures for food and alcohol, but did not use the lengthy detailed measurement strategy.

In Wave 2 of the IP, households were randomly assigned to receive identically worded cards or letters as advance communications to encourage participation. . The format of respondent correspondence may vary significantly in look and feel, even though the information provided in the material remains the same. Outcomes were similar for the two formats with respect to both household and individual level response. The decision connected with this study was to use formal personalised letters. The result is lower survey operational costs with no reduction in level of response and with the additional flexibility in tailoring of messages.

APPENDIX

CONSUMPTION EXPERIMENT – QUESTION WORDING

There are three treatment groups with varying levels of cues for expenditures to include or exclude in relation to household consumption. Households were randomly assigned to one of the three treatment groups. This appendix lists the questions for each group.

TREATMENT GROUP 1

Ask if Treatment = 1

Q1 The next question deals with the expenses of your household. Apart from your housing costs and utility bills, about how much has your household spent on **all other expenses in the last month,** such as food, clothing, transport and entertainment costs?

INTERVIEWER: IF DON'T KNOW ASK FOR ESTIMATE

TREATMENT GROUP 2

Ask if Treatment = 2

Q2 The next question deals with the expenses of your household. Apart from your housing costs and utility bills, about how much has your household spent on **all other expenses in the last month**? Please include food eaten at home and food eaten outside the home, alcohol and tobacco, clothing and footwear for all household members, medicines and health expenses, car and public transport costs, telephone and internet costs, entertainment, leisure activities and hobbies.

INTERVIEWER: IF DON'T KNOW ASK FOR ESTIMATE

TREATMENT GROUP 3

Ask if Treatment = 3

Q3 Can you tell me approximately how much your household has spent on food and groceries at a grocery store or supermarket in the **last month**?

INTERVIEWER: IF DON'T KNOW ASK FOR ESTIMATE

Ask if Q3 > 0

Q4 About how much of this amount was for non-food items, such as paper products, detergents, home cleaning supplies, pet foods and alcoholic beverages?

INTERVIEWER: IF DON'T KNOW ASK FOR ESTIMATE

Ask if Treatment = 3

Q5 In the past month, have you or any members of your household purchased any food or non-alcoholic beverages from places other than grocery stores or supermarkets, such as the bakers, butcher, delicatessen, home delivery, vegetable or farmer's markets?

INTERVIEWER: EXCLUDE FOOD EATEN OUT AT RESTAURANTS OR CAFES OR TAKE AWAYS

1 Yes
2 No

Ask if Q5 = 1 (Yes)

Q6 About how much has your household spent on food at these places in the **last month**?

INTERVIEWER: IF DON'T KNOW ASK FOR ESTIMATE

Ask if Treatment = 3

Q7 And can you tell me approximately how much you (and members of your household) spent on meals or food purchased outside the home in the **last month**?

INTERVIEWER: IF DON'T KNOW ASK FOR ESTIMATE

Ask if Treatment = 3

Q8 About how much have you (and members of your household) spent on the following items in the *last month*. Firstly alcohol and tobacco?

INTERVIEWER: IF DON'T KNOW ASK FOR ESTIMATE

Ask if Treatment = 3

Q9 Clothing and footwear for all household members?

INTERVIEWER: IF DON'T KNOW ASK FOR ESTIMATE

Ask if Treatment = 3

Q10 Medicines, prescriptions and other health expenses?

INTERVIEWER: IF DON'T KNOW ASK FOR ESTIMATE

Ask if Treatment = 3

Q11 Car and public transport costs?

INTERVIEWER: IF DON'T KNOW ASK FOR ESTIMATE

Ask if Treatment = 3

Q12 Telephone, including landline, mobile and internet costs?

INTERVIEWER: IF DON'T KNOW ASK FOR ESTIMATE

Ask if Treatment = 3

Q13 Entertainment, leisure activities and hobbies?

INTERVIEWER: IF DON'T KNOW ASK FOR ESTIMATE

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UNDERSTANDING SOCIETY: CONCLUSIONS AND LOOKING FORWARD

By Stephanie L. McFall

The Editor has the fortunate task of appreciating the work of others and getting to suggest some additional directions for research. The set of chapters included in this volume is of varied types, in addition to showing the independent perspectives of the authors. There are three types of chapters – overview chapters about the overall study of *Understanding Society*, the UK Household Longitudinal Study, chapters that define measures and research opportunities related to major domains of research such as work, and application chapters about specific research question. The overview chapters, written by researchers active in each field, endow their summary of available measures with a sense of their future research contributions. They alert users to the expanding opportunities in these domains. The application articles were not meant to pre-empt enquiry related to their topics, but to raise expectations with what can be done now with more complex cross-sectional analyses and, in particular, with longitudinal research.

OVERVIEWS OF *UNDERSTANDING SOCIETY*

The opening chapter (Broadfoot, Buck) reminds us of the major investments that has been made in *Understanding Society* to produce a panel study sufficiently large, varied in sample characteristics and content, and innovative in methodological approach to support investigations into the nature of UK society for many years to come. Some of the trends shaping the research agenda of *Understanding Society* include the ageing of society; the effects of immigration and ethnic diversity; changes in family and work life; and the conflicting movements toward European centralisation, regionalisation, and devolution. The research applications presented in this volume are relevant to the research agenda described by Buck, but only begin their exploration.

Changing family and household contexts are an important part of the *Understanding Society* research agenda

I anticipate that users of the data will find themselves frequently referring to the description of the study design, data collection methods, and content plan contained in the design overview by Burton, Laurie and Lynn (Appendix). Their initial presentation of the response outcomes will be useful to those planning to use the data. They also demonstrate that the characteristics of the sample are broadly comparable to the Labour Force Survey for the same period. The process of examining such benchmarks of survey quality will be ongoing.

Methodological research on longitudinal surveys is underdeveloped relative to what is known about cross-sectional surveys. The importance of developing this knowledge base is reflected in the research agenda for *Understanding Society* and in the investment in a methodological testbed called the Innovation Panel (IP). Uhrig describes the design and operation of the Innovation Panel, which supports research into the best ways of asking questions and conducting fieldwork operations for longitudinal household surveys. While not all studies using the Innovation Panel are experimental, it is a major capability of the IP. He presents two case study experiments related to the complex measurement of household consumption and decisions about the format of materials to communicate with study participants. It is interesting that in each case the decision derived from the study integrated the study results with considerations of resources.

FAMILY RELATIONS AND THE LIVES OF YOUTH

Changing family and household contexts are an important part of the *Understanding Society* research agenda, integral to its design and long-term content. Ermisch, Iacovou and Skew introduced current and future measures that have been widely used in research on family relationships. Their illustrative analyses focus on satisfaction with relationships and bring together the perspectives of household members with different roles – male and female partners and parents and children.

Two application chapters focus on the well-being of young people in relation to lack of material resources and in response to repeated negative interactions or bullying. Not being able to do things expected in life, like getting together with friends socially, has been viewed as closer to the experience of deprivation than lack of money alone. Following that, measures of material deprivation viewed relevant to children have been developed. Knies asks if the overall life satisfaction of children aged 10-15 is related to measures of material deprivation of children. This analysis found that life satisfaction is associated with overall financial resources and with family relationships, notably presence of siblings, but not to the childhood material deprivation measures.

Wolke and Skew use novel data from the Youth Questionnaire to show adverse effects of bullying on life satisfaction and a measure of behavioural problems, the Strengths and Difficulties Questionnaire. A great deal of research on bullying has focused on organised settings like schools. However, this chapter reports on the heightened problems experienced by children of this age when bullied within both schools and homes (by siblings).

WORK AND INCOME

Understanding Society's research agenda also has a major focus on economic productivity, employment, unemployment and the experience of work. Bryan provides an overview of measures important to labour market research. For a research illustration he chose the association of work-related measures to two summary measures of sleep; perceived quality and duration. This research shows complex interplay between objective and subjective aspects of work and home life, which vary by gender.

Taylor made use of the overlap of the recession of 2009 with the period of data collection for Wave 1, Year 1 of *Understanding Society*. In this chapter he identifies groups that were among the bigger losers in the recession in relation to having employment. Groups that were more affected were the young, those with lower education levels, single rather than partnered people, lone parents, and those working in construction, wholesale and retail and hospitality industries. He also examined more subjective outcomes of financial well-being (finding it difficult to get by) and expectations for the future.

Berthoud's chapter on Income and Economic Well-Being is grouped with this section because earnings are a major component of income. Income is frequently the focus of policy and basic research. It is even more frequently employed as a variable explaining access to other desirable states. Berthoud introduces potential users of *Understanding Society* to basic process in the collection and derivation of such variables as total household income and poverty. Perhaps because of the centrality of income in social and economic research, it is rare for such an experienced analyst to lead potential users of the data through the underlying decisions in data collection and computation of measures. Research using these measures from this study is at its beginning. The rough correspondence to the Family Resources Survey should be encouraging to potential users. They should also welcome planned value-added developments related to income and other financial resources.

HEALTH STATUS AND SLEEP

Relative to the British Household Panel Study, *Understanding Society* has an expanded focus on health. Booker and Sacker provide an overview of measures of health included in the early waves of the study. They also describe the research potential for planned linkage of administrative health records to the *Understanding Society* survey data and the collection of bio-measures. As a research illustration, they take up the question of impairments and employment of persons aged 60-69. Various policy proposals have considered mechanisms to encourage people to stay in the labour market to older ages. Their analysis suggests that the magnitude of the group to stay employed may be smaller than imagined based on health limitations of the group.

Relative to the British Household Panel Study, *Understanding Society* has an expanded focus on health

Arber and Meadows introduce a novel set of measures of sleep and sleep problems. *Understanding Society* will be the first longitudinal study to have both varied indicators of sleep and wide-ranging health and socio-economic variables. Their findings on sleep associations with sociodemographic characteristics will be interesting to explore to trace interconnections with health and major social variables. Their chief contribution is to show that persons with lower social resources – lower educational qualifications and social class – are disadvantaged with respect to sleep. Future research should deepen our understanding of the determinants and consequences of what happens in a segment of life in which all engage but do not all equally enjoy.

SOCIAL PARTICIPATION, LOCAL ENVIRONMENT AND ENVIRONMENTAL BEHAVIOURS

The *Understanding Society* research agenda includes a focus on connections to place and social participation. Buck and Rabe summarise measures relevant to research about local environments and social networks. There is growing interest in the use of multi-level models to explore the unique and joint influences of local environments and individual level characteristics. Their illustrative research includes the first application of geo-coded data to the *Understanding Society* survey data. There is a growing amount of aggregate and area level information, and analysts will be able to link it via various UK geographies. Buck and Rabe contrast the social and demographic characteristics of neighbourhoods that are highest and lowest in amount of 'green space'. They also examine multiple indicators of social cohesion for varying environmental units.

Social cohesion and social participation is the topic of the application chapter by Ferragina, Tomlinson and Walker. They present a theoretical model of participation that combines indicators of social cohesion and consumption, arguing that the inability to afford a certain level of consumption excludes people from full participation. Participation has long been an important sociological concept. Their model shows that *Understanding Society* will be a rich source of data for novel theoretical explorations.

The overview chapter by Lynn and Longhi on environmental attitudes and behaviours summarises novel measures among the puzzle pieces needed to address policy questions about the environment and sustainability. Like Arber and Meadows' chapter on sleep, these analyses of environmental attitudes and behaviours illustrate the capacity of *Understanding Society* to link objective and subjective perspectives on important areas of life.

LOOKING AHEAD

This volume is based on data collected in 2009, the first year and wave of *Understanding Society* from the new general population sample. The research agenda related to ethnic diversity was not addressed and awaits the release of data from the ethnic minority boost sample. The capability to compare and contrast the experiences of major ethnic minority groups will be a much anticipated development.

The overview chapters – environmental behaviours, family relations, health, work, and local environments – placed the survey's contents in the context of prior research in these areas. Since each also noted the important contributions that will come with additional waves of the study, I refer those planning their future research to the individual chapters.

The social sciences in the UK are justifiably conscious of the legacy and prospects of longitudinal surveys. The design of *Understanding Society* is intended to support an important and varied research agenda. This volume is the introduction to the important contributions expected from this investment in the social sciences.

The design of *Understanding Society* will support an important and varied research agenda

APPENDIX: *UNDERSTANDING SOCIETY* DESIGN OVERVIEW

Jon Burton | Heather Laurie | Peter Lynn

INTRODUCTION

This appendix provides an overview of the design and conduct of *Understanding Society* (for further details see **www.understandingsociety.org.uk**). The first section describes the main design features and governance arrangements for the study. It is followed by description of the sampling design and associated rules for following sample members over time. The chapter also summarises the questionnaires and content of the study and describes the data collection process. It concludes with a report of the Wave 1 Year 1 response rates, and compares characteristics of the *Understanding Society* sample with the distribution on key demographic variables to those in the UK Labour Force Survey (LFS) (Office for National Statistics, 2010).

KEY DESIGN FEATURES AND STUDY GOVERNANCE

There are several key features of the design of *Understanding Society* that reflect its scientific rationale and are intended to generate major innovations in scientific research. These include:

- **Large sample size** of 40,000 households to allow more fine-grained analysis;
- **Household focus** of the design with data collected on all members aged 10 and over within sampled households;
- **Full age range sample** which complements age-focused cohort studies in the UK and provides a unique look at behaviours and transitions in mid-life and throughout the life course;
- **Innovation Panel** – a vehicle for methodological research, for survey development and to further methodological knowledge relating to longitudinal surveys (This Innovation Panel is described more fully in Chapter 13);
- **Multi-topic design** to meet a wide range of disciplinary and inter-disciplinary research needs;
- **Ethnic minority research** agenda and the inclusion of a boost sample of ethnic minority groups to support research on ethnic diversity and commonality;
- **Collection of biomarkers and health indicators** as a resource for research at the interface of social and bio-medical sciences;
- **Data linkage to administrative records and geo-coded data** to provide significant new research opportunities where the social survey data can be used in combination with administrative data.

Understanding Society is the successor household panel study to the British Household Panel Survey (BHPS). The BHPS has collected 18 waves of data since 1991 and the sample will be included within *Understanding Society* from Wave 2 to enable continuing longitudinal analysis of the BHPS sample alongside the new samples. Fieldwork for the first five waves of the study is being conducted by the National Centre for Social Research (NatCen) with collaboration with the Central Survey Unit of the Northern Ireland Statistics and Research Agency (NISRA) in Northern Ireland.

Understanding Society is funded by the UK Economic and Social Research Council (ESRC) with co-funding from several government departments including the Department for Work and Pensions (DWP), Department for Education (DfE), Department for Culture, Media and Sport (DCMS), Department for Transport (DfT), the Department for Community and Local Government (DCLG), the Scottish Government, the Welsh Assembly Government, the Department of Environment, Food and Rural Affairs (DEFRA), and the Food Standards Agency (FSA).

The study's Governing Board is convened by the ESRC. It has representatives from academia, social policy organisations, and government departments

The study has a Governing Board that is convened by the ESRC, drawing on representatives from academia, social policy organisations, and government departments. The Governing Board is responsible for oversight of the conduct of the study, strategic decision-making, and ensuring the widest possible use of the study data and impact of resulting findings. In addition, a Scientific Advisory Committee comprised of external experts provides advice to the Principal Investigator, Nick Buck, and the scientific leadership team. The investigators of the scientific leadership team are based at the Institute for Social and Economic Research (ISER) at the University of Essex, the University of Warwick, and the Institute of Education. This committee is supported by three external committees focused on key areas encompassed by the study, including a Methodological Advisory Committee, a Health and Biomarkers Advisory Committee, and an Ethnicity Strand Advisory Committee.

SAMPLE DESIGN AND FOLLOWING RULES

Four of the most valuable features of *Understanding Society* are its large overall sample size, its longitudinal nature, the household context, and the boost sample of ethnic minorities. These features provide an unparalleled set of research opportunities, but they also set considerable challenges for sample design. Here we describe how the sample design has met those challenges.

The main general population sample aims to be fully representative of the UK resident population and to provide sufficient precision for the analysis of important subgroups. It is based on an equal-probability scientific sample of around 1 in 500 addresses throughout England, Scotland and Wales and around 1 in 250 addresses in Northern Ireland, amounting in total to 49,920 addresses. For a detailed description of the sample design, see Lynn (2009). The sample is split into 24 monthly samples designed to be representative of the UK population at a quarterly level. The sample in England, Scotland and Wales was a two-stage clustered design, which enhances the cost-efficiency of fieldwork. At the first stage, approximately one in every four postcode sectors was selected, giving 2,640 Primary Sampling Units (PSUs). The second stage involved selecting 18 addresses in each of those postcode sectors. Although equal-probability, the sample in Great Britain is therefore not a simple random sample. In Northern Ireland, a single-stage sample of addresses was selected with no clustering.

At each sample address, every person resident at the time of the Wave 1 fieldwork is defined as a sample member. At subsequent waves, attempts are made to locate every sample member, wherever they may be, and to collect data about them and all other members of their current household (who may or may not themselves be sample members). This means that we must follow households who move to new addresses. We also have to follow sample members who move out of a Wave 1 household, as well as continuing to follow the remaining household members. The basic principle of the survey 'following rules' is very simple: at each wave we aim to collect data from each sample member and all other members of that person's current household. Although considerable resources are required to implement these 'following rules', they are an essential component of the survey design. It is these 'following rules' that permit probability-based longitudinal analysis of a representative sample.

The ethnic minority boost sample involved screening around 43,000 addresses to identify members of the relevant ethnic minority groups. These 43,000 addresses were not selected with equal probability. Instead, postcode sectors were sampled at different rates, based on the estimated ethnic composition of the sector. The sectors included in the sample – comprising around 30% of all sectors in Britain – are estimated to cover 80 – 90% of the members of ethnic minority populations of interest. Between 1 in 60 and 1 in 3 addresses were selected from these sectors, depending on the estimated ethnic mix in the sector. The net result is that selection probabilities vary both within and between ethnic minority groups in the boost sample. In analysis, the use of sample weights is essential to achieve a representative sample.

The ethnic minority boost sample is designed to provide a sufficiently large sample size of each of five key ethnic minority groups to allow these groups to be analysed separately (and compared with each other). The boost is designed to achieve an additional 1,000 individual interviews in each of five groups: Indian, Pakistani, Bangladeshi, Caribbean and Black African. In addition, other minority groups including Chinese, Turkish, other Asian and Middle Eastern are included.

During the screening survey, once an eligible person was identified at Wave 1 ('screened in'), that person was then deemed a sample member and the same 'following rules' are applied as described above for the general population sample. Further details of the design of the ethnic minority boost sample are provided (Berthoud, Fumagalli, Lynn & Platt, 2009). There is also a comparison sample of some 500 households identified from within the new general population sample. This sample will be administered the same interview as members of the ethnic minority boost sample, to allow comparisons between the minority groups of interest and the general population.

There are two other sample components. The first is the Innovation Panel sample of 1,500 households. This is an equal probability sample of Great Britain (in this case south of the Caledonian Canal and excluding Northern Ireland) with 120 PSUs and 23 issued addresses per PSU. The second is the continuation of the existing British Household Panel Survey (BHPS) sample which is included in the study from Wave 2.

The final sample, therefore, will consist of four main components as in Table 1. Until year 2 of Wave 1 is complete, we cannot provide actual numbers for the whole sample, so the numbers for Wave 1, Year 2 are estimates. Analyses in the rest of this volume are restricted to the first twelve months of the general population sample only (i.e. 14,103 households).

QUESTIONNAIRE DESIGN AND CONTENT

The questionnaire structure for *Understanding Society* consists of:

- Household questionnaire (including household membership roster) of 15 minutes
- Individual interview for all adults aged 16 years and over (32 minutes for the general population sample, 37 minutes for the ethnic minority boost sample)

Table 1 Estimated sample size components *Understanding Society*

Component	Achieved Interviewed Households (Wave 1, Year 1)	Estimated Interviewed Households (Wave 1, Year 2)	Estimated Achieved Households (Wave 1, Years 1 and 2)
New General Population Sample	14,103	12,800**	26,903
Ethnic Minority Boost Sample	1,588	2,400	3,988
Innovation Panel	1,489	--	1,489
BHPS Sample	8,144*	--	8,144
Total	**25,324**	**15,200**	**40,524**

*Note that the Wave 1, Year 1 BHPS numbers are in fact from BHPS Wave 18 (2008) due to the timing overlap of the two studies. The BHPS sample is included in the study from Wave 2 (2010).
** The numbers in the GP sample at Wave 1, Year 2 are smaller than in Year 1 as all Northern Ireland interviews take place in Year 1 of the fieldwork period.

- Self-completion questionnaire for all interviewed adults (7 minutes)
- Proxy interview for adults aged 16 years and over who are unable to be interviewed (10 minutes)
- Self-completion youth questionnaire for children aged 10-15 years (on the BHPS the youth questionnaire was from age 11-15 years).

At Wave 1, all interviews were carried out face-to-face in respondents' homes using a computer-assisted personal interviewing (CAPI) questionnaire for the household, individual and proxy questionnaires. Paper instruments were used for both the adult self-completion and the youth questionnaire. All questionnaires within the CAPI script, the paper self-completions, and all associated fieldwork materials for respondents were translated into nine languages: Arabic, Bengali, Cantonese, Gujurati, Punjabi (Gurmukhi and Urdu scripts), Urdu and Welsh. Bi-lingual interviewers or translators were provided where necessary. Participants living in Wales were offered the choice of an interview in Welsh or English and Welsh speaking interviewers were available to conduct interviews in Welsh.

ANNUAL AND ROTATING CONTENT

Following extensive consultation with users it was clear there was demand for a wide range of content to be included on the study. To meet this demand within the available questionnaire length, *Understanding Society* has adopted a model in which questions are organised in topical modules and modules appear annually (core) or on a rotating basis. Rotating modules vary in frequency depending on the subject matter and expected rates of change. The annual core is approximately 50% of the interview length. In addition to the core and rotating modules, there are questions asked only after key events, such as the birth of a child or moving house.

Because some of the annual measures are BHPS questions, analysts can examine a longer time series for that sample component. Incorporation of many measures from the BHPS will allow longitudinal analysis in key areas to continue for the BHPS sample. In addition, the inclusion of some BHPS measures provides continuity with the new *Understanding Society* sample. See also Laurie (2010) on the relationship between the BHPS and *Understanding Society.*

A key design task in the initial stages was to agree which measures were critical for the annual panel design and which questions should be carried annually. Table 2 sets out the content of the annual repeated measures and the rotating modules. The table also includes information about modules which are included as part of the additional coverage for the ethnic minority boost sample and the content of the youth self-completion questionnaire.

Questions are organised in annual or rotating modules. Their frequency depends on the subject matter and expected rates of change

The Wave 1 questionnaire includes additional factual background measures, including details of parental background along with some life history information including a full cohabitation, marriage and fertility history and a migration history for the ethnic minority boost. Anecdotal evidence from interviewers and respondents suggests that on the whole participants find the survey coverage interesting. These reports are reflected in the interviewer observations where over 96% of respondents were said to have good or very good co-operation during the interview, with 77.3% having very good co-operation.

Table 2 Summary of questionnaire content

Annual repeated measures	Rotating modules	Ethnic minority boost	Youth self-completion
Basic demographic characteristics for all household members	Health-related behaviour, diet, exercise and sleep	Language and functional English literacy	Relationships with family and friends
Housing characteristics	Leisure and cultural participation	Migration history	Social networks
Housing expenditure	Wealth, assets and debts	Remittances	Illicit/risky behaviour
Household facilities, car ownership	Mental health and well-being	Employment discrimination	Experience of education and aspirations
Consumption expenditure	Psychological/personality traits ('Big 5')	Harassment	Bullying at school and between siblings
Changes between waves – employment, fertility, partnering, geographic mobility, education and training, diagnosis health condition	Illicit/risky behaviour	British identity	Use of leisure time
Health status (e.g. SF12), disability, GHQ-12	Family and social networks	Ethnic identity	Health, diet and obesity, exercise
Education aspirations and expectations	Family relationships	Additional items on political engagement	Self-esteem and satisfaction with life
Labour market activity and employment status, job search	Local neighbourhood	Additional items on family and social networks	Strength and Difficulties Questionnaire (SDQ)
Current job characteristics, basic employment conditions, hours of paid work, second jobs	Social support	Use of smokeless tobacco	Future aspirations for job, family, independence
Childcare, other caring within and outside household	Travel behaviour	Financial literacy and financial inclusion	Social and political attitudes and values
Income and earnings	Environmental attitudes and behaviour	Religious practice	Financial behaviour and paid work
Life satisfaction	Political engagement	Civic capital/use of services	Caring responsibilities
Political affiliation	Employment conditions		Ethnic and religious identity
Transport and communication access	Time use preference and risk		
Child development and parenting (from Wave 3 for children aged 3, 5 and 8 years)	Trust		
Expectations of retirement			
Initial conditions, place of birth, education, family background, relationship and fertility information (at first interview only)			

Table 3 Summary of bio-measures

Direct measures	Biological samples
Height and weight Waist circumference Bio-electrical impedance Grip strength Blood pressure and pulse rate Lung function (nurse collection only)	Whole blood (nurse collection only) Saliva (interviewer collection only) Dried blood spots (interviewer collection only)

BIO-MEASURE COLLECTION

Understanding Society is a bio-social survey providing data that will support bio-medical and social science research. The addition of bio-measures permits the examination of objective biological, anthropometric and functional measures within a large sample that spans many ages and which can be studied in a household context. The study provides information about social and economic factors that influence health status and the trajectory of health outcomes. The data will enable analysts to assess exposure to and antecedent factors of people's current health status, give a better understanding of disease mechanisms, such as gene-environment interactions, allow an assessment of household and socio-economic effects on health, as well as analyses of outcomes using direct assessments and linkage of health administrative data with survey responses. The collection of bio-measures began during Wave 2 (2010/11) of *Understanding Society* and will continue throughout Wave 3 (2011/12). While the available funding does not allow collection from all sample members, we estimate that between 25,000 and 30,000 adults will have these measures. The aim is to collect these measures from a subsample of the *Understanding Society* general population sample at Wave 2 and BHPS sample members at Wave 3 so that the longitudinal survey data can be used in conjunction with the bio-measure data and provide early longitudinal results.

The collection of bio-measures is more invasive than standard survey questions. It is therefore necessary to obtain ethical approval from the National Research Ethics Service (Health Survey for England, 2009) for all procedures and participant materials relating to the collection of bio-measures. The nurse collection of bio-measures for Waves 2 and 3 has been approved by the Oxfordshire A Research Ethics Committee. More information about this will be included in the documentation for Wave 2 of *Understanding Society*.

Two types of bio-measures are being collected. The first are direct measures and the second are biological samples to be stored for use in later analysis (see Table 3 for more information). Health researchers are increasingly incorporating bio-measures in the analysis of pathways to disease and in the exploration of the emergence of health disparities (for example Chandola, Brunner & Marmot, 2006; Seeman, Crimmins & Huang, 2004; Sabbah, Watt, Shelham & Tsakos, 2008). The data collection for this element of the study will be done either by nurse interviewers or by trained survey interviewers.

The measures to be taken are set out in Table 3. There are some measures which are only to be taken by a nurse, or by an interviewer and these are indicated in the table. Direct measures are those where the data is available immediately at the point of interview. Biological samples are collected during the interview and despatched for storage. Results from any analyses on these samples will not be fed back to participants. In addition to the bio-measures, Wave 3 will collect cognitive ability/functioning measures for the whole sample.

In the UK, there are well-developed protocols for the collection of bio-measures by nurse interviewers on studies such as on the Health Survey for England. The collection of some of the proposed measures by trained interviewers rather than nurses, in particular taking saliva and dried blood spots, has never been done on large scale surveys in the UK. There is experience in major US population surveys of successful use of these minimally invasive approaches being carried out by well-trained survey interviewers (McDade, Williams & Snodgrass, 2007, Lindau & McDade, 2008; Weinstein, Vaupel & Wachter, 2008). We are drawing on this experience in developing our procedures. The protocols and interviewer training for this element are therefore innovative for the UK.

DATA COLLECTION AND FIELDWORK PROCEDURES

DATA COLLECTION MODES

The first wave of *Understanding Society* is principally a face-to-face survey, with a self-completion additional element; the interviews are conducted by interviewers who visit participants' homes. The survey is administered using a computer-assisted personal interviewing instrument (CAPI). Each interviewer has a secure and encrypted laptop which contains the survey instrument written using Blaise software. The advantage of using a CAPI instrument is that it allows for complex routing and filtering of questions, it is able to perform some quality checks on the responses and can use information given earlier in the interview. The CAPI software enables interviewers to 'toggle' between English and another language. Where a bilingual interviewer is not available to carry out the interview, a translator accompanies an interviewer to the household. Adults who give a full interview are also asked to fill out a short paper self-completion questionnaire.

FIELDWORK DESIGN

As described above, one of the key features of *Understanding Society* is its large sample size. However, this does present a challenge in terms of fieldwork capacity. The solution to this was to randomly allocate the sample to 24 monthly samples and spread the fieldwork for each wave over two calendar years. Sample members are interviewed annually. Therefore, there is an overlapping sample design; with the second year of Wave 1 being in the field at the same time as the first year of Wave 2.

Interviewers have one month to contact the households in their allocated sample and carry out *Understanding Society* interviews with all eligible adults and young people. Households in which no interviews are achieved in the first

month are returned to NatCen. Those which had been non-contacts or 'soft' refusals are then re-issued, often to a different interviewer. The re-issue period also lasts a month.

The fieldwork timetable in Northern Ireland is slightly different. The survey was not put into the field in January 2009, but started on the 2nd of February 2009. To ensure that a quarter-year is still representative, the February and March samples are slightly larger than the average for April-December. The Wave 1 *Understanding Society* sample in Northern Ireland is spread over 11 monthly samples (February-December) rather than 24.

The screening phase for the ethnic minority boost sample is separate to the interviewing phase. It takes place three weeks prior to the sample field month. If the screening interview identifies a household as eligible for the ethnic minority boost, the information is recorded and that household is allocated to the interviewer working in that area. There is no ethnic minority boost sample in Northern Ireland. The BHPS sample did not form part of the Wave 1 fieldwork. That sample will be incorporated from Wave 2 onwards.

COMMUNICATION WITH PARTICIPANTS

An important study like *Understanding Society* needs a strong brand image so that it is recognisable to participants. This helps to foster loyalty to the study. The survey name and logo is used in all respondent materials. In addition, there is contact information on all participant documents to enable them to contact ISER easily and without cost using a Freephone number, email address or Freepost address. The advance materials can be seen at **http://data.understandingsociety.org.uk/documentation.** The participant materials consist of:

- On the doorstep – information leaflet about the study, appointment card
- During the interview – participant pack with Participant Handbook, fridge magnet with sample month printed on, pen, self-completion questionnaires
- After the interview – participant reports (small leaflet with initial findings from the study), change-of-address card, participant website

A participant website has been set up to give participants more information about the study. The website is used to provide participants with updated information and findings coming out of the study as well as being an additional means for participants to update their personal name and address details. As part of the between-wave mailing, when participants receive a short report based on initial analysis of the data, they are given a unique 'invitation code', which can be used to register with the website. Once registered and verified, the sample member is then able to inform us of any change in their contact details. There are now 419 registered sample members of which 303 have used the website to update their address or personal details. Registered sample members can access additional information about the findings of the study and comment on stories and news items which are posted on the website. In the period May 1st to November 1st 2010, there were 951 unique visits to the participant web site. This initial high level of interest suggests that with continued promotion the website can contribute to building an active forum for *Understanding Society* participants.

The overall household response rate for Wave 1, Year 1 was 59.3%

INTERVIEWER BRIEFINGS

Before fieldwork started, all interviewers working on *Understanding Society* attended a one-day face-to-face project-specific briefing. These were held at different locations around the country to minimise interviewer travel (Birmingham, Bristol, Derby, Glasgow, Leeds, London, Manchester). The Wave 1 briefings started one month before *Understanding Society* went into the field. There were 12 briefings in December, 13 in January and then some later in the year for interviewers newly recruited to *Understanding Society*. Generally, each briefing was attended by 12-20 interviewers, one or two people from the fieldwork agency and the area managers from the area in which the briefing was being held. Staff from ISER also attended the December briefings.

The topics covered were at the briefings were:

- Fieldwork design: timetable, targets for working, screening procedures
- Sample design: general population and ethnic minority boost samples
- Branding: study name and logo, different stages of contact with sample members
- Contact and co-operation: methods to minimise non-contacts, evidence from call patterns, maximising response
- Procedures: using the Address Record Form (ARF), dealing with multiple dwelling units and/or households, different ARFs for general population and ethnic minority samples, exercises in completing ARFs
- Screening and language: screening process, dealing with non-English speaking households, translations
- Interview process: overview of instruments, overview of procedures, eligibility rules, use of proxy interviews, importance of getting contact details, collecting consents for data linkage, self-completions, incentives
- CAPI questionnaire: structure, individual modules, consents, self-completions, demonstration.

Table 4 Household response rates on the general population sample: Year 1 Wave 1

	England	Wales	Scotland	Northern Ireland	Total
Responding	10,915	697	1,199	1,292	14,103
	58.9%	64.4%	58.2%	61.7%	59.3%
Non-contact	969	50	124	88	1,231
	5.2%	4.6%	6.0%	4.2%	5.2%
Refusal	6,109	306	658	689	7,762
	33.0%	28.3%	31.9%	32.9%	32.7%
Other non-response	539	29	81	25	674
	2.9%	2.7%	3.9%	1.2%	2.8%

*Eligible households only / ineligible addresses excluded from the base

ADVANCE CONTACTS

Advance cards were sent to the selected addresses before an interviewer or screener called. The sample was a sample of addresses, without names, and so the advance cards were addressed to 'The Occupier'. The advance card for the general population sample contained a £10 voucher and contained the information that if anyone else in the household was interviewed, they would also receive a £10 voucher. The advance cards for the screening sample were different, since such a large number of addresses were being issued for screening. The cards for the screening sample said that an interviewer would be calling, and would ask them a few questions 'and may ask your household to take part in an interview.' The advance cards for the screening sample did not contain a voucher, but said that if anyone in the household is interviewed they would receive the £10 voucher. The advance cards were sent by NatCen and were timed to be received around one week before an interviewer called.

INTERVIEWER CONTACT

When the interviewer calls at an address they are required to make a number of observations about the neighbourhood and the house. These observations include whether the address has been split into more than one dwelling units, such as apartments or flats. If there are up to three dwelling units at the address, the interviewer includes all of them in the sample. If there are more than three dwelling units, the interviewer uses a set of rules (a Kish selection grid, see Kish, 1949) to randomly select three units. Likewise, if a dwelling unit is found to contain up to three households, all households are eligible to participate. If there are more than three households, then a Kish grid is used to select three households.

The interviewer first seeks to make contact with an adult member of the household. The first part of the interview is the enumeration of household members. This is a list of all those who live in the household. The interviewer then conducts the household interview with the person in the household responsible for the rent or mortgage, or spouse. All adults aged 16 years or older are asked to participate in an individual interview. Adults who complete an individual interview are asked to fill in a self-completion questionnaire. If there are any children aged 10-15 years in the household, the interviewer asks the parent or guardian for their consent (verbal) to ask the child to complete a short paper questionnaire. If an individual is not going to be present during the fieldwork period, or is present in the household and does not want to participate but is willing for someone to answer questions on their behalf, a proxy interview may be carried out.

If there are people living in the household who are not present when the interviewer calls, the interviewer is expected to call back. Multiple calls to households are expected.

RESPONSE RATES

The response rate for the general population sample for the first year of Wave 1 in England, Scotland and Wales was 59.0% of eligible households. The response rate in Northern Ireland was 62.2%. The overall response rate for Year 1 was 59.3%. There were 14,103 co-operating households at Year 1 of Wave 1. A co-operating household is one in which at least one adult participated.

Table 5 Adult (16 years and over) response rates: Year 1 Wave 1

	England	Wales	Scotland	Northern Ireland	Total
Full interview	17,246	1,138	1,808	1,977	22,169
	82.0%	84.5%	81.6%	76.5%	81.6%
Proxy interview	1,061	42	67	91	1,261
	5.0%	3.1%	3.0%	3.5%	4.6%
Partial interview	67	5	4	20	96
	0.3%	0.4%	0.2%	0.8%	0.4%
Non-contact	616	35	78	147	876
	2.9%	2.6%	3.5%	5.7%	3.2%
Refusal	1,430	89	178	268	1,965
	6.8%	6.6%	8.0%	10.4%	7.2%
Other non-response	614	37	80	81	812
	2.9%	2.7%	3.6%	3.1%	3.0%
Base	**21,034**	**1,346**	**2,215**	**2,584**	**27,179**

Base = all persons aged 16+ enumerated in co-operating households

Table 6 Household screening and response rates on the ethnic minority boost sample: Wave 1 Year 1

Phase 1: Screening Survey	**N addresses**	**Col %**
Issued	21,817	100.0
Ineligible address	1,681	7.7
In scope	20,136	100.0
Screened	18,543	92.1
Screened	18,543	100.0
Ineligible for inclusion	15,701	78.0
Refusal	150	0.7
Non-contact	1,240	6.2
Other	194	1.0
Eligible for inclusion	2,842	14.1
Phase 2: Interview		
Responding	1,588	55.9
Refusal	791	27.8
Non-contact	33	1.2
Other	430	15.1
N Eligible households	*2,842*	*100.00*

Table 7 Individual-level response rates for co-operating households in the ethnic minority boost sample: Year 1 Wave 1

	England	Wales	Scotland	Total
Full interview	3,145	24	21	3,190
	68.2%	64.9%	91.3%	68.2%
Proxy interview	240	0	0	240
	5.2%	0.0%	0.0%	5.1%
Partial interview	60	3	0	63
	1.3%	8.1%	0.0%	1.3%
Non-contact	211	1	0	212
	4.6%	2.7%	0.0%	4.5%
Refusal	700	3	2	705
	15.2%	8.1%	8.7%	15.1%
Other non-response	258	6	0	264
	5.6%	16.2%	0.0%	5.6%
Total N	4,614	37	23	4,674

Table 5 gives the individual-level co-operation rate, conditional on a household response, for the first year of Wave 1. These are response rates for individuals within co-operating households as we do not know how many individuals were present in non-co-operating households.

The household co-operation rate, conditional on being screened in, for the ethnic minority boost in the first year of Wave 1 was 55.9%. In Table 6, the upper panel gives information about the outcomes at the screening phase of the ethnic minority boost. The lower panel takes all those screened in as the base and gives information about the outcome during the main stage of fieldwork. There were 1588 responding households in the ethnic minority boost in the first year of Wave 1. We have not reported these figures by country, since the sample was not designed to provide a representative sample of each minority group within each country. Details of the sample design and selection procedures for the ethnic minority boost sample can be found in Berthoud et al (2009). A change in the way that outcomes were coded occurred in September 2009, which saw an increase in the proportion of refusals and a decrease in the proportion of 'other' unproductive households.

Table 7 gives the individual-level response rate within co-operating households in the first year of Wave 1 for the ethnic minority boost sample.

COMPARISON OF SAMPLE DISTRIBUTION WITH EXTERNAL ESTIMATES

In Table 8 we present some initial comparisons of year 1 of the general population sample of *Understanding Society* with the Labour Force Survey (2009, Quarters 1-4, first wave of interview only), in terms of some key demographic variables. The Labour Force Survey (LFS) was chosen for this comparison because it is a national survey with a large sample size and a good response rate, and fieldwork spread throughout the year, like *Understanding Society*. Also, both surveys attempt to cover the same population, namely all persons living at domestic residential addresses. The LFS estimates use the person weight (PWT09), which compensates for non-response and aggregates to the population total. This provides the best available estimates for 2009 on these variables. The analysis is restricted to the Great Britain sample of both surveys. The *Understanding Society* sample is weighted using the design weight (dweight) without any non-response adjustment. The design weights adjust for unequal probability of selection at the sample design stage. The design weights vary for multiple dwellings and households and for the sample design in Northern Ireland.

As Table 8 shows, the two surveys have very similar sample distributions on the characteristics compared. There is no difference between the surveys on housing tenure status but the *Understanding Society* sample appears to have a higher proportion of female participants than the LFS, a higher proportion of children younger than 16 years and a lower proportion of those aged 65 or older. The *Understanding Society* sample has a higher proportion of divorced individuals and a lower proportion of those who are widowed. The *Understanding Society* sample contains a lower proportion of participants who are in paid employment and higher proportion of those who are not in paid employment or looking for work. Although these differences are statistically significant, the sample sizes are large and so the actual percentage differences between the two samples on these key characteristics are quite small.

CONCLUSION

Understanding Society is designed to provide high quality longitudinal data to answer research and policy needs over the coming decades. The study represents a significant investment in the social sciences in the UK. Every effort is being made to conduct the study to the highest standards of best practice in survey methodology and the methodology of conducting longitudinal surveys. This appendix has briefly described some of the key elements of the design and conduct of the study. As the data now become available, the wider user community can begin to benefit from this investment. The large sample size offers new opportunities to study sub-groups that may be too small for separate analysis on other studies while the UK-wide sample affords new avenues for comparative country, regional and geographic research. The new content included in *Understanding Society*, not least the bio-measures, provides exciting prospects for interdisciplinary research across the social and medical sciences. The Innovation Panel is already proving to be an invaluable resource for methodological research which pushes the boundaries of knowledge within longitudinal survey methodology. Finally, the inclusion of the BHPS sample within *Understanding Society* enables this long running panel to continue into the future, opening up inter-generational research and the opportunity to look at very long-term trajectories of change.

Table 8 Comparison of Great Britain Labour Force Survey sample and *Understanding Society* general population sample on key characteristics

	Labour Force Survey	*Understanding Society*
Sex		
Male	49.2	48.4*
Female	50.8	51.6*
Base: all in respondent households	*114,307*	*34,502*
Age		
0-15	18.9	21.0*
16-24	12.1	12.0
25-34	13.0	12.5*
35-44	14.8	14.8
45-54	13.6	13.4
55-64	11.9	12.1
65+	15.8	14.3*
Base: all in respondent households	*114,307*	*34,477*
Marital status (age 16+)		
Single, never married	32.8	32.6
Married, living with husband/wife	49.8	50.1
Married, separated from husband/wife	2.5	2.4
Divorced	7.9	8.7*
Widowed	6.7	6.0*
Civil Partner	0.2	0.2
Base: all in respondent households aged 16 +	*94,373*	*27,163*
Housing tenure		
Owned outright	30.8	30.9
Being bought with mortgage or loan	35.6	35.2
Part rent, part mortgage	0.4	0.5
Social housing renting	18.3	18.6
Private renting and other	14.8	15.0
Base: respondent households	*49,938*	*14,103*
Employment Status		
Employee	58.0	56.8*
Self-employed	8.7	8.0*
Looking for work	6.3	5.4*
Not in employment or looking for work	27.0	29.8*
Base: respondents aged 16-69	*80,022*	*19,241*

* significant at 1%

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