

The Measurement of Well-being: the Contribution of Longitudinal Studies

Report by Longview, July 2012

**Tom Schuller, Michael Wadsworth,
John Bynner, Harvey Goldstein**

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Contacts

This publication

For information about the content of this publication,
Email: nationalwell-being@ons.gsi.gov.uk

Other customer enquiries

ONS Customer Contact Centre
Tel: 0845 601 3034
International: +44 (0)845 601 3034
Minicom: 01633 815044
Email: info@statistics.gsi.gov.uk
Fax: 01633 652747
Post: Room 1.101, Government Buildings,
Cardiff Road, Newport, South Wales NP10 8XG
www.ons.gov.uk

Media enquiries

Tel: 0845 604 1858
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EXECUTIVE SUMMARY

Introduction and background

This report deals with the part longitudinal studies can play in shaping our understanding of well-being. It was commissioned by the Office for National Statistics (ONS) as part of their programme on the Measurement of National Well-being (MNW). The specific aims of this scoping study are to provide expert guidance and recommendations on:

- UK longitudinal datasets which currently contain questions of relevance to key well-being domains;
- longitudinal surveys which may be best placed to serve as vehicles for well-being questions in future;
- longitudinal data relevant to well-being which is available from the census-linked studies; and
- administrative, educational or health records which could be used to provide longitudinal evidence of well-being.

This executive summary:

- outlines the specific contribution longitudinal studies can make to the measurement of national well-being, including cross-cohort, cross-national and inter-generational studies;
- summarises the report's coverage of eighteen major longitudinal studies in terms of data relevant to the four ONS subjective well-being questions¹ and the domains identified by ONS as directly affecting individual well-being²;
- highlights key technical and methodological considerations in the measurement of well-being; and
- provides a set of recommendations for future directions.

The context for this report is one of a growing international interest in the measurement of well-being, and recognition of the limitations of traditional measures of societal progress such as Gross Domestic Product (GDP). The Measuring National Well-being Programme at ONS is headed by the National Statistician and aims to deliver independent and trusted measures of national well-being. This work pre-dates the recent political interest in well-being by the UK government and reflects an ongoing commitment to promoting the use of trusted measures of well-being in the development and evaluation of policy. This report is part of a set of reviews and consultations on how best to take this forward and deliver accepted and trusted measures of national well-being.

¹ Overall how satisfied are you with your life today? Overall how happy did you feel yesterday? Overall how anxious did you feel yesterday? Overall to what extent do you feel the things you do in your life are worthwhile?

² Our relationships; Health; What we do; Where we live; Personal finance; Education and skills. The full set of ten domains proposed by ONS for measuring national well-being also includes individual well-being and three contextual domains, the economy, the natural environment and governance.

Longitudinal studies and policy relevance

Chapter 1 sets out the main features of longitudinal studies. Longitudinal studies track stability and change across time in the lives of the same individuals. When repeated across time, or when covering all age groups, such as in a household panel study, they can be used to study stability and change in society over time. They provide information of unique value for the development and evaluation of policies focused on well-being including:

- the extent of stability and change in well-being over time with indications of the direction and extent of changes over time in the national picture;
- how well-being changes with age for particular population sub-groups and the prevalence of well-being, inequalities in its distribution and social mobility for these groups; and
- how policies impact on subjective and objective well-being, including how groups with different exposure to specific policies may be affected by them in different ways.

The UK longitudinal data for exploring well-being

Chapters 2 and 3 describe the main longitudinal research resources that are included in this review. Eighteen longitudinal datasets were selected for review because of their large sample size, their long period of data collection and their inclusion of relevant information for the study of well-being. They were grouped as follows:

- *The major birth cohort studies*, which follow the lives of the same people from birth onwards and include the cohorts of 1946 (NSHD), 1958 (NCDS), 1970 (BCS70), 1990 (ALSPAC) and 2000 (MCS);
- *Household panel surveys*, which regularly follow-up all members (over a specified age) of a sample of households and include the British Household Panel Study (BHPS), Understanding Society (USoc), Families and Children Study (FACs), and the Wealth and Assets Survey (WAS).
- *Longitudinal studies of individuals*, which begin in adolescence or adulthood and include the Longitudinal Study of Young People in England (LYSPE), the 2007 West of Scotland Survey (WoS), the West of Scotland Teenage Health Study (WoS, 11-16), the English Longitudinal Study of Ageing (ELSA), the Life Opportunities Survey (LOS), the Whitehall2 Study, and the UK Biobank Study.
- *Census-linked studies*, which follow the lives of a sample of individuals via linkage of census records, health and vital events data and include the ONS Longitudinal Study covering England and Wales (ONS LS), the Scottish Longitudinal Study (SLS) and the Northern Ireland Longitudinal Study (NILS).

The review involved contacting each longitudinal study team for information. We received responses from 15 of the study teams, and further information about the studies was obtained from relevant websites. For three studies, only data from websites was used. Three of the studies are now discontinued.

This report concentrates primarily on the measurement of subjective well-being. However, the longitudinal studies contain an enormous amount of actual and potential information for the measurement of objective well-being as well.

The four ONS subjective well-being questions

ONS has included four experimental subjective well-being questions on its household surveys since April 2011 as set out in the ONS consultative document (*Measuring National Well-being*). These are:

- “Overall how satisfied are you with your life today?”
- “Overall how happy did you feel yesterday?”
- “Overall how anxious did you feel yesterday?”; and
- “Overall to what extent do you feel the things you do in your life are worthwhile?”

Data collected in the studies reviewed here in relation to these four questions is summarised in Figure 5.1, at the end of this report. It is important to note that although all the studies except the three census-linked studies have relevant data on subjective well-being, they do not necessarily use identical questions or collect the data in the same way as ONS. The older birth cohort studies have consistent data on this topic which covers the life course from early adulthood to the early sixties. The most recent birth cohort (2000-01) has data for the first ten years of life. Collectively, the studies of individuals or households reviewed here cover the whole life course.

The most consistent longitudinal data relevant to the ONS subjective well-being questions can be found in the three oldest birth cohorts, Whitehall2, the English Longitudinal Study of Ageing and the British Household Panel Study/Understanding Society. The Wealth and Assets Survey has included the four questions since mid 2011 (wave 3) and ELSA will include the ONS questions at the next wave. The UK Biobank study also has strong potential given the inclusion of well-being questions in the baseline data.

Individual well-being and the ONS domains

In Chapters 2 and 3, we summarise the longitudinal data available in the domains identified by ONS as directly affecting individual well-being. A brief overview is provided below for each domain area.

- *Individual well-being*: Data on subjective well-being began to be collected regularly in the birth cohort studies from the early 1990s and in ELSA. The continuing household panel studies (BHPS and USoc) also provide data for consistent measurement of the components of well-being in the areas covered by the four ONS subjective well-being questions.
- *Our relationships*: Each of the older birth cohort studies has extensive data about partnerships, social life, and neighbourhood. ELSA has similar data. BHPS and USoc have data on partner relationships, and BHPS also has data on satisfaction with social life.
- *Health*: The birth cohort studies all have extensive objective data on growth, physical and mental health, illness and disability, but less data on satisfaction with these areas. The household panel studies cover satisfaction with health and mental health, from 1991 to the present.

- *What we do:* All the birth cohorts have some data on satisfaction with occupation, and prospects. The other studies cover satisfaction with work, leisure time and income, and volunteering.
- *Where we live:* The birth cohort studies have data on satisfaction with accommodation. The other studies cover area of residence, and the 2007 Study also has data on fear of crime.
- *Personal finance:* Although all the studies have much data on income, there is relatively little data on satisfaction with personal income and with household income.
- *Education and skills:* The birth cohort studies and the household panel studies have a mass of data about education and skills, and longitudinal data on most aspects of satisfaction with these.

Methodological and technical issues

In Chapter 4 we identify a number of technical and methodological issues to be dealt with in the process of developing measures of national well-being. Prime amongst these are:

- recognising the ways in which different dimensions of well-being may interact with each other, and the need for regular updating of instruments to ensure continuing validity;
- ensuring comparability across time and generations;
- understanding the implications of missing data;
- ensuring ongoing reliability and stability of the measures used; and
- developing the capacity to use multi-level modelling, especially to measure inequalities at different levels.

These issues present challenges, but in many cases there are established methods for addressing them.

Recommendations

1. We suggest that the ONS Technical Advisory Group (TAG) is the appropriate body to assume principal responsibility for taking forward the conclusions of this report. They could consider setting up a sub-group specifically on longitudinal data, and/or could co-opt additional expertise for this purpose. In particular the group should:
 - a. keep under review progress in the measurement of well-being and the development of new measures with specific reference to the role longitudinal studies can play in this, including linkage of administrative and health record data;
 - b. discuss with existing major longitudinal study teams the development and maintenance of well-being measurement in their studies;
 - c. liaise with the forthcoming Cohort Resources Facility, the UK Longitudinal Studies Centre at the University of Essex, and the Centre for Longitudinal Studies at the Institute of Education over support for the ONS well-being measurement strategy;
 - d. facilitate harmonisation of measurement across studies while maintaining a planned variety of approaches;
 - e. steer the development of new measures and methodological research programmes; and
 - f. promote secondary analysis of existing longitudinal data to support the ONS programme.

2. To reflect the importance and central role of the Understanding Society study (USoc) and the national birth cohort studies in supporting the measurement of well-being agenda, ONS should seek to ensure the continuation of well-being measurement in the studies as data collection in them continues.
3. ONS should seek to develop further the longitudinal resource by the addition of questions on well-being in younger people in the Longitudinal Study of Young People in England, the Millennium Cohort Study, Avon Longitudinal Study of Parents and Children and the new national birth cohort study due to begin in 2012. Similarly it would be valuable to add subjective well-being questions to the longitudinal studies concerned with later life. The English Longitudinal Study of Ageing will include the four questions from wave 6 (2012), but the new Northern Ireland Cohort for the Longitudinal Study of Ageing (NICOLA) could also include them as could the prospective Health and Ageing in Scotland study (HAGIS). It would also be helpful if the UK Biobank Study, and the 1958 and 1946 national birth cohort studies included the questions. The Wealth and Assets Survey already includes the ONS subjective well-being questions and has potential to throw new light on well-being particularly in relation to the personal finance domain.
4. ONS, in liaison with the Research Councils, should encourage further follow-up (e.g. directly through questions to parents or indirectly through administrative data sources) of the already studied and now adult offspring of the 1946 and 1958 cohort members. This would provide a unique opportunity to study inter-generational well-being. The scope for extending such research to the children of the 1970 cohort study members, Understanding Society and other longitudinal studies should also be investigated.
5. ONS and the Research Councils should support a programme of secondary analysis of existing longitudinal data to enhance understanding of the origins and outcomes of well-being. This could comprise:
 - a. a literature review to identify existing gaps;
 - b. analysis of the relationships between the subjective and objective measures of well-being to make clear the processes through which well-being is gained or lost;
 - c. analysis of well-being at different life course stages – childhood, adolescence, adulthood, old age;
 - d. comparison across cohorts to investigate how societal changes may affect well-being; and
 - e. investigation of national differences in well-being through the use of integrated international datasets (e.g., the Survey of Health, Ageing and Retirement in Europe (SHARE) and the Cross National Equivalent File (CNEF comprising household studies in eight countries including the US and Russia)).
6. A programme of methodological investigations should be undertaken by ONS in collaboration with the UK Research Councils to include:
 - a. validation of existing measures possibly as part of the ESRC's secondary data analysis initiative to include analysis of the dimensions of well-being, identification of the relationships between the dimensions and with other variables, and assessment of changes in the validity of well-being measures over time to identify whether and how they should be refined;

- b. analysis of short and long-term stability and reliability of well-being measures; and
 - c. measurement of inequality in well-being and factors that affect well-being at different levels of aggregation such as local communities and in institutions like workplaces.
7. ONS in liaison with the Measuring National Well-being Technical Advisory Group should examine the case for expanding the scope of well-being measurement to include social and civic activity. Analysis of existing longitudinal data to explore how well-being relates to active citizenship would be a first step.

Chapter 1 Introduction to the review: background and policy relevance

1.1 Background

Concern with measuring well-being is part of a broader movement to expand the criteria used for assessing the effects of socio-economic change on individuals. Clearly such a broad ambition requires a wide range of indicators. The highly authoritative report to former President Sarkozy, on *Measuring Economic Performance and Social Progress*³, conceptualises well-being as multi-dimensional, comprising: material living standards; subjective features such as personal affect; health; education; personal activities; political voice; social connections; and economic and physical (in)security. The OECD publication, *A Framework to Measure the Progress of Societies*, includes a similar set of dimensions of progress. Significantly, one of the two 'final goal' dimensions is 'Human Well-being'. This covers physical and mental health, knowledge and understanding, work, material well-being, freedom and self-determination, and interpersonal relationships. Clearly we are at a turning point in the measurement of progress, with well-being at the heart of it.⁴

In the UK, the Office for National Statistics has taken up the issue through a series of consultations and discussion papers. In the recent (Oct 2011) publication, *Measuring National Well-being (MNW) - Discussion paper on domains and measures* - the domains are outlined as follows:

- Individual well-being

Factors directly affecting individual well-being:

- Our relationships
- Health
- What we do
- Where we live
- Personal finance
- Education and skills

More contextual domains:

- Governance
- The economy
- The natural environment

³Stiglitz, Joseph, Amartya Sen & Jean-Paul Fitoussi (2009) *Measuring Economic Performance and Social Progress*, report to the President of France, Paris

⁴ See also: <http://www.measureofamerica.org/california/> for a California initiative which especially emphasises distributional issues in assessing well-being.

Cross cutting issues are identified as:

- Equality and fairness
- Sustainability

The focus of this contribution from Longview is on the part longitudinal studies can play in shaping our understanding of the dimensions of well-being reflected in these domains. Britain not only has extensive indicator data on socio-economic and health outcomes, but also information on many aspects of well-being in longitudinal sample studies of individuals and households. In particular, the British Household Panel Survey (BHPS) established in 1991 and its successor Understanding Society (USoc), are major sources of longitudinal data on how components of well-being have changed within households. The five large-scale birth cohort studies have longitudinal data on components of well-being in individuals over the 66 year period since 1946 when the first cohort study was launched. Other longitudinal data sources considered here include the following:

- English Longitudinal Study of Ageing (ELSA);
- Life Opportunities Survey (LOS);
- Wealth and Assets Survey (WAS);
- Longitudinal Study of Young People in England (LSYPE);
- Families and Children Study (FACS, now completed);
- West of Scotland Teenage Health Study (WoS 11-16, now completed);
- 2007 West of Scotland Study (WoS 2007 study, now completed);
- Whitehall2 Study
- ONS Longitudinal Study (ONS LS);
- Scottish Longitudinal Study (SLS);
- Northern Ireland Longitudinal Study (NILS); and
- UK Biobank Study

The specific aims of this scoping study are to provide expert guidance and recommendations on the following:

- UK longitudinal datasets which currently contain questions of relevance to the domains identified by ONS as directly affecting individual well-being;
- longitudinal surveys which may be best placed to serve as vehicles for subjective well-being questions in future;
- longitudinal data relevant to well-being which is available from the census-linked studies; and

- administrative, educational or health records which could be used to provide longitudinal evidence relating to well-being.

1.1.1 Structure of this report

Next in this introduction we lay out the general policy relevance of longitudinal studies and establish their actual and potential value.

Chapters 2 and 3 deal with the present position, drawing on data gathered from our colleagues who work on longitudinal studies. In response to a consultative questionnaire, they furnished details of the information relevant to well-being gathered in their studies⁵. Chapter 2 provides a note on historical context and then focuses on the longitudinal data available in relation to the four ONS subjective well-being questions. In each case, we separate out the data available from the birth cohort studies and data available from other longitudinal datasets. Chapter 3 adopts the same approach for data relating to the ONS domains directly affecting individual well-being. We provide an overview of the information supplied, and illustrate how it could be used in greater depth to shape the measurement of well-being.

As noted, the studies reviewed here include the census-linked longitudinal studies and those linking together administrative data from government departments and other sources. Although such datasets contain little if any direct measurement of subjective well-being, their relevance lies in the objective information they contain about social, economic and health status and the effects of these on well-being. The typical scope of such data is exemplified by the Work and Pensions Longitudinal Study (see Box 1).

Box 1: Work and Pensions Longitudinal Study (WPLS)

Introduced in January 2004 and enhanced in October 2005, this dataset links welfare benefits and programme participation data information held by the Department for Work and Pensions (DWP) with employment records from HMRC. The study's aims are to provide data relevant to child poverty reduction, welfare to work, and retirement income planning. The survey comprises a 100% sample of all DWP clients and provides, for every person:

- benefits or pension first claimed and any subsequent ones;
- any help or interventions received from Jobcentre Plus;
- leaving benefit and entry into employment;
- return to benefit;
- information about income;
- key personal details; and
- Housing/Council Tax Benefit and Tax Credits receipt

Chapter 4 contains an overview of technical and methodological issues, including discussion of key challenges in the use of longitudinal data for the measurement of well-being.

⁵ We are grateful to the colleagues who responded. They are not responsible for the use we have made of the material, and we have not had time to consult them on the conclusions we have drawn. Indeed, one of our recommendations is that *these conclusions and the ONS response to them should be the basis of a wider debate or consultation.*

Chapter 5 concludes with a summary of the relevant longitudinal data available for the measurement of well-being, followed by conclusions and recommendations.

1.2 Longitudinal studies and policy relevance

Longitudinal studies track stability and change in the lives of the same individuals over time. When they comprise multiple sample cohorts such as the household panel studies or when they are repeated across many years, they can be particularly useful in studying stability and change in society as a whole. The large-scale multi-purpose longitudinal studies in the UK can also draw upon a wide range of variables to explain the changes observed and to predict later outcomes in economic, family, community, educational and health domains. They can therefore contribute to the debate on the measurement of national well-being in number of areas such as:

- the extent of stability and change in well-being over time with indications of the direction and extent of changes over time in the national picture;
- how well-being changes with age for particular population sub-groups and the prevalence of well-being, inequalities in its distribution and social mobility for these groups; and
- how policies impact on subjective and objective well-being, including how groups with different exposure to specific policies may be affected by them in different ways.

More generally, data accumulated at regular intervals throughout the life course, at a number of levels (e.g., individual, family and community) and from a number of sources (e.g., personal interview and administrative records) can provide a particularly valuable tool in the search for explanations of what enhances or diminishes well-being⁶.

The scientific potential offered by longitudinal studies is complemented by their value to the formulation, implementation and evaluation of policy⁷. Longitudinal studies offer the potential to model cause and effect. This enables us to assess the effects of policies and the likely effects of implementing different policy options. Longitudinal data can help us to understand the factors that have an effect on well-being as well as how changes in well-being affect people's lives in different ways. Boxes 2 and 3 give illustrative examples from longitudinal studies of how early life experiences impact on long-term mental health outcomes and how adult learning impacts on subjective well-being among older people⁸.

⁶ Robins, L. and Rutter M. (1990) *Straight and Devious Pathways from Childhood to Adulthood*. Cambridge: Cambridge University Press.

⁷ Bynner, J. and Joshi, H. (2007) 'Building the Evidence Base from Longitudinal Data: The Aims, Content and Achievements of the British Birth Cohort studies,' *Innovation: the European Journal of Social Science Research*, 20, (2) 159-179.

⁸ Schoon I., Parsons, S., Rush R. and Law, J. (2010) Children's Language Ability and Psychosocial Development: A 29-Year Follow-up Study, *Pediatrics*, 126, e73-e80; Jenkins, A. (2011) Participation in Learning and Wellbeing among older adults, *International Journal of Lifelong Learning*, 30, 405-420.

Box 2: Early language difficulties and adult mental health

Secondary analysis of data collected from birth to age 34 in the 1970 birth cohort study demonstrates the lasting negative effects of language difficulties as measured at age 5 on adult mental health as measured at age 34. The family background in which the child grew up, such as mother's psychological distress during cohort member's childhood, and poor family circumstances, were also implicated in the child development and in long-term mental health outcomes. These findings suggest policy areas for policy intervention.

Box 3 : Adult learning and well-being

Data from the first three waves of the English Longitudinal Study of Ageing (ELSA) showed the effects of participation in different kinds of adult learning classes on older (50+) adults' self-assessed well-being. Music, arts and evening classes were significantly related to improvements in subjective well-being. By contrast, formal courses (e.g. work-related) and exercise classes were not related to improvements in self-assessed well-being.

Specific policy interventions to boost well-being - especially when phased in over a period of time or implemented only in selected geographical areas - can draw on longitudinal data collected in household panels or cohort studies to assist evaluation of their effectiveness. The longer the studies are continued, the richer potentially the data for analysis of well-being effects.

Long-term longitudinal studies can be usefully extended in three ways of particular value to policy-makers and researchers:

- •cross-cohort studies (comparing well-being data collected from cohort studies started at different times) to assess the effects of societal change on well-being and its relationship to other variables;
- •cross-national studies to assess the effectiveness of policies to enhance well-being in different countries taking account of institutional and cultural differences; and
- •inter-generational studies, involving data collection from cohort members' children to assess the transfer of well-being between generations.

It is also important to note that longitudinal data can include information collected using either qualitative or quantitative research methods or both. However, the emphasis here is on large-scale quantitative studies.

1.3 Cross-cohort studies

The policy value of birth cohort studies is enhanced by the opportunities they offer to compare two or more cohorts born at different times, as in the nationally representative British birth cohort studies series. This includes the cohorts of: 1946 (NSHD), 1958 (NCDS), 1970 (BCS70), 1991-2 (ALSPAC)⁹, and 2000 (MCS). Data collected from individuals in a longitudinal study reflect three types of 'extrinsic' influence on well-

⁹Area level study based on the population of Avon.

being at any point in time: the age effect, the period effect, and the cohort effect¹⁰. Inter-cohort analysis enables us to: analyse responses of cohort members at the same age/stage of life but in different socio-historical contexts, or to analyse those at different ages within the same socio-historical context¹¹.

These different approaches are illustrated in two texts. The first, called *Changing Britain: Changing Lives*, compares 30 year-olds born in 1946, 1958 and 1970, demonstrating the effects of 24 years of societal change on the life chances and well-being of those in their early thirties. The second text, *A Companion for Life Course Studies*, supplies historical accounts of the changing socio-historical and policy context in the areas of citizenship, family, education, economics, labour market participation and skills, health and health care and leisure across the period before and since the end of World War II, when the first British birth cohort study began¹². Box 4 gives an example of how changing socio-economic circumstances have impacted on the physical development of children in the 1946, 1958 and 1970 cohorts¹³. Box 5 provides an example of how experiences of depression and unemployment are related over time among those in the 1958 and 1970 cohorts¹⁴.

Box 4: Changing impacts of socio-economic circumstances on development

Improved child health was associated with increases in average adult height across the 1946, 1958 and 1970 birth cohorts. Comparing the cohorts, there was a reduction in the extent to which adult height was related to socio-economic circumstances. This suggests a levelling out over time of the differences that family social and economic circumstances make on children's health and development.

¹⁰ This reflects the age of the respondent (A); the period (date) when the data were collected (P); and the cohort (date) in which the respondent was born (C). $C+A = P$ - hence any two of the three effects is confounded with the third.

¹¹ Bynner, J. (2005) 'Longitudinal Cohort Designs' in Kempf-Leonard, K. (ed.) *Encyclopaedia of Social Measurement*, Vol 2, 591-599.

¹² Ferri, E., Bynner, J. and Wadsworth, M. (eds) (2003), *Changing Britain, changing lives: three generations at the end of the century*, London: Institute of Education; Wadsworth, M. E.J. and Bynner, J. (eds.) (2011); *A Companion to Life Course Studies. The social and historical context of the British birth cohort studies*, London: Routledge.

¹³ Wadsworth M et al (2003) in E Ferri, J. Bynner & M. Wadsworth *Changing Britain, changing lives* pp219-224, Institute of Education Press, London); Li L et al (2008) 'Child-to-adult body mass index and height trajectories: a comparison of two British birth cohort studies' *American Journal of Epidemiology*, 168, 1008-1015

¹⁴ Bynner, J. (1998) 'Education and family components of identity in the transition from school to work', *International Journal of Behavioural Development*, 22: 29-53.

Box 5: Depression and unemployment

Analysis of data in the 1970 national birth cohort identified psychological well-being both as an outcome of poor educational attainment and as a precursor to time spent unemployed since age 16. There were signs of a vicious circle in which depression and poor self-esteem arising from unemployment reduced the prospects of employment, and this led to a further degeneration in self-esteem.

In the 1958 cohort, social class and educational attainment were key factors in the amount of time spent unemployed. By contrast, a much more complex range of factors were linked to unemployment in the 1970 cohort. This included: social class, parents' education, educational attainment, leaving school early, and depression. There were also signs of a vicious circle in the 1970 cohort in which depression and poor self-esteem resulted from unemployment and made future employment less likely.

1.4 Cross-national longitudinal studies

Longitudinal studies within a single country usually measure individual change within a common policy and implementation context. They can examine the effects of variations in different types of institution, such as different types of school or hospital, on well-being outcomes, but cannot assess the effects of societal factors as a whole. In order to measure this, longitudinal studies starting in the same period and replicated cross-nationally are required.

The major challenge for cross-national research is achieving comparability of data, recognizing the limitations imposed by language and cultural differences as well as possible variations in sampling methods. There are a variety of different types of cross-national longitudinal studies. For example, one approach is to mount a study in several countries with a standardised questionnaire, as was done with the European Community Household Panel (ECHP), which ran from 1994 to 2001. Another variant is a close collaboration of researchers in different countries conducting highly similar studies, as is the case with the Survey of Health, Ageing, and Retirement in Europe (SHARE). This started in 2004 and, like ELSA, is modelled on the US Health and Retirement Survey.

Another approach is to harmonise the data from a set of similar studies so that they can be analysed jointly. Examples of this type include the Cross-National Equivalent File (CNEF) 1980-2010 embracing currently the British Household Panel Study (BHPS), the Household Income and Labour Dynamics in Australia (HILDA), the Korea Labor and Income Panel Study (KLIPS), the US Panel Study of Income Dynamics (PSID), the Russian Longitudinal Monitoring Survey (RLMS-HSE), the Swiss Household Panel (SHP), the Canadian Survey of Labour and Income Dynamics (SLID), and the German Socio-Economic Panel (SOEP)¹⁵.

Each UK birth cohort study has taken steps to develop a comparative research component often with one other country. The European Child Cohort Network (EUCCONET) based in INED in Paris involves eight European countries engaged in new birth cohort studies for exchange of information and advice.

All these collaborative frameworks – especially SHARE and CNEF – offer potential opportunities to extend longitudinal research on well-being cross-nationally.

1.5 Inter-generational studies

The scope for inter-generational study exists particularly within each of the earlier birth cohort studies, depending on the range of data collected retrospectively about the histories of the cohort members' parents before the birth¹⁶ of the cohort child. Thus self-assessed well-being or its negative counterparts (e.g. depression) can be traced from parent to child at comparable ages (e.g. 16) and the inter-generational transmission of well-being can be assessed, taking account of changing family circumstances and experiences. An example in the economic sphere is shown in Box 6¹⁷.

¹⁶ Burkhauser RV and Lillard DR. (2007) The Expanded Cross-National Equivalent File: HILDA Joins Its International Peers. *Australian Economic Review*, 40, 208-215.

¹⁶ The household panel studies are also limited by this requirement and at least in the case of BHPS with 15 years of annual data collections children (aged 11- 16) do not have sufficient numbers to do the analysis effectively.

¹⁷ Gregg, P., and Machin, S. (1998). Childhood disadvantage and success or failure in the youth labour market, Centre for Economic Performance Discussion Paper 397.

Box 6: Transmission of economic well-being from cohort members' parents to cohort members

Analysis of data from the 1958 birth cohort study shows how growing up in a low income household can lead to negative longer term outcomes such as joblessness and participation in crime. Having parents with low income or earnings during the years of growing up is a strong disadvantage in terms of labour market success and can contribute importantly to outcomes like adult joblessness and participation in crime. These negative outcomes can persist long into adult life and can spill over to the next generation.

A much richer inter-generational enhancement is possible via the extension of data collection from cohort members to their children¹⁸. This offers the opportunity to investigate inter-generational continuities and discontinuities in family circumstances, physical and mental development, education and health, and to assess the effect on well-being on 'transmitted deprivation'¹⁹ or escape from it²⁰. Data collected from cohort members' children has added significant value to the 1958 (NCDS) and 1970 (BCS70) birth cohort studies datasets²¹. Box 7 gives an example of how such inter-generational data has been used in a comparative way to test whether maternal employment has adverse effects on children's cognitive and behavioural development²².

Box 7: Impacts of mothers' employment on children's cognitive and behavioural outcomes

Using data from the second generation of two cohort studies, the 1970 British Birth Cohort Study (BCS70) and the US 1979 National Longitudinal Study of Youth, the cognitive and behavioural development of school aged children was analysed in relation to maternal employment before the child's first birthday. Only two out of five US estimates of maternal employment in the child's first year had a significant effect on child development. Maternal employment was negatively related to reading comprehension but positively related to freedom from problem behaviours.

By contrast, none of the estimates were significant for four child outcomes modelled in Britain, suggesting that there is little if any harm apparent among school age children from maternal employment during a child's infancy. The reason for the lack of negative impact in the UK may be related to the greater extent of part-time employment of mothers in the UK than the US and longer allocations of maternity leave in the UK.

¹⁸ Fox, J. and Fogelman, K. (1989) 'New Possibilities for Longitudinal Studies of Intergenerational Factors in Child Health and Development', in Magnusson, D. and Bergman, L. R. (1990) *Data Quality in Longitudinal Research*, Cambridge: Cambridge University Press.

¹⁹ *Cycles of Disadvantage*, Michael Rutter and Nicola Madge. Heinemann. Educational Books Limited, 1976.

²⁰ Pilling, D. (1990) *Escape from Disadvantage*, London: The Falmer Press.

²¹ The sample of children is still limited by the fact that female cohort members' child bearing at the times of the child surveys had yet to be completed and for some it had not yet begun. Such censoring biases the sample towards younger mothers but sample-based estimates can be adjusted to compensate for this.

²² Cooksey, E., Joshi, H. & Verropoulou, G. (2000) Does mothers' employment affect children's development? Evidence from the children of the British 1970 Birth Cohort and the American NLSY79. *Longitudinal and Life Course Studies*, 1, 95-115

Inter-generational assessment of this kind creates three-generation datasets involving cohort members, their parents and their children. Inclusion of grandparents extends the set to four generations, though for the earlier birth cohort studies (1946, 1958 and 1970), the data for grandparents is quite limited.

Follow-up of cohort members' children was first undertaken in the 1946 cohort study. This involved three data collections on 2,205 firstborn children of cohort members who were then aged 20-25 years. Data has also been collected on the children of the 1958 cohort study members. In this case, a random sample of one third of cohort members and their children were surveyed, including 4,800 children in all. Similarly, in the 1970 cohort, data was collected from half of the cohort members and their 5,200 children. Self-completion questionnaires were completed by children aged 10 or more and this included questions relevant to their well-being. These datasets offer rich opportunities for both cross-sectional inter-generational analysis of well-being.

1.5.1 Children's well-being

As we have seen, a number of different approaches have been taken to measuring children's well-being among the cohort studies. This includes asking children directly using self-completion surveys or obtaining indirect reports of the child's well-being from parents or teachers. Another valuable source of longitudinal data on children is educational records. For example, data from the National Pupil Database (NPD) could be linked to longitudinal studies to augment the information available about children. Box 8 considers such linkage and the potential uses of information from the National Pupil Database (NPD).

Box 8: Use of the NPD to augment data on children's well-being

Much of the research on well-being has so far focused on adults. However, it is also important to understand the well-being of children and young people. Existing datasets such as the National Pupil Database (NPD) in England could help with this. The NPD allows a sample of primary and secondary school pupils with known characteristics to be drawn and studied further. The existing educational data from the NPD could be augmented by the collection of data from students about their well-being. This could be analysed along with numerous contextual measures that are already available in the database, such as educational performance results and free school meal eligibility. The ability to readily follow-up students over one or more years would be very valuable for measures of long term change. The Department for Education are giving thought to ways in which the NPD could be augmented such as this.

1.6 The complementarity of longitudinal studies with other research

Finally, it should be emphasised that whilst large-scale longitudinal surveys have a particular contribution to make to the understanding of individual well-being, they may be most valuable when used in conjunction with other forms of data collection. Repeated cross-sectional general population surveys such as the Integrated Household Survey will be the key means of monitoring changes in well-being across the population. However, qualitative case studies would also be valuable in illuminating in more detail the processes by which well-being is gained or lost. Qualitative methods are also very useful for the development and ongoing refinement of survey questions. The goal here is not to promote longitudinal surveys at the expense of other forms of research, but to urge that they are used alongside and in

combination with other appropriate research methods. This inevitably makes for a more complex picture, but a mixed-method approach is especially important early on in the process of constructing a set of well-being indicators.

1.7 Summary

The chapter introduces the case for much greater use of the wide range of longitudinal data sets available in the UK. We suggest ways in which they might be used both to gain a better understanding of how well-being develops and is maintained or lost over time as well as how it can best be measured. The main emphasis is on subjective well-being, while recognising that all the studies contain a wealth of objective information about context and socio-economic status to aid analysis.

Eighteen longitudinal studies are reviewed, including all the major UK longitudinal studies. They cover a period of 66 years since the first birth cohort study was launched in 1946.

The relevance of longitudinal data with respect to the well-being policy agenda lies in its unique ability to enable investigation of:

- the extent of stability and change in well-being over time with indications of the direction and extent of changes over time in the national picture;
- how well-being changes with age for particular population sub-groups and the prevalence of well-being, inequalities in its distribution and social mobility for these groups; and
- how policies impact on subjective and objective well-being, including how groups with different exposure to specific policies may be affected by them in different ways.

The main research designs that can extend the analytic potential of longitudinal data further are:

- cross-cohort studies that compare two or more cohorts of the same age but in different eras;
- cross-national studies using comparable longitudinal datasets; and
- inter-generational studies extending data collection to cohort members' children²³.

The first two of these offer opportunities for enhancing our understanding of well-being through the exploitation of existing data. The third will require either new data collection among cohort members' children, or linkage of existing data on cohort members' children (e.g., from educational, health records, etc) to the cohort datasets.

²³ The intergenerational studies referred to in this section need to be distinguished from the macro-level intergenerational accounting done by ONS

<http://www.ons.gov.uk/ons/search/index.html?pageSize=50&newquery=intergenerational+accounting>

Chapter 2 UK longitudinal data for exploring subjective well-being

This chapter focuses on the data that is currently available from the longitudinal studies reviewed on the four ONS subjective well-being questions. We also include a brief note on the context in which the UK longitudinal data has been collected, since part of the longitudinal perspective is to enable us to understand how well-being is shaped by broader historical trends.

2.1 Introduction and background

In this section, we provide background information about the research methods, criteria for selection of studies in the review, definition of terms, and how we have met the study objectives.

2.1.1 Criteria for inclusion in the review

We selected for inclusion in the review the eighteen longitudinal studies noted in Chapter 1 and described below. The criteria for inclusion were that they should:

- have a large sample;
- cover a long time period; and
- contain relevant information for the study of well-being.

The studies selected and reviewed include:

- five birth cohort studies;
- four large-scale household panel studies;
- six studies of individuals begun in adolescence or later; and
- three census-linked longitudinal studies.

2.1.2 Research methods

We circulated a grid to researchers responsible for the eighteen studies, structured to reflect the domains identified by ONS as directly affecting individual well-being. For each study, we asked the following questions:

- Has your study collected data on this area?
- What wording and scales were used?
- What ages were the individuals to whom the questions were asked?²⁴

We also invited researchers to make any further comments they wished on the issue of well-being measurement.

²⁴ The grid template is provided in the Appendix. A full set of their responses is provided in Annex 1 as a separate file available from Longview at www.longviewuk.com.

We are grateful to the colleagues who responded. They are not responsible for how we have used the material nor for the conclusions drawn. Indeed, one of our recommendations is that these conclusions and the ONS response to them should be the basis of a wider debate or consultation.

The overview provided here is neither comprehensive (in the sense of covering all possible relevant longitudinal datasets) nor exhaustive (in the sense of analysing to the full the material supplied in the questionnaire returns). Nevertheless it provides a good starting point for illustrating the actual and potential value of the main UK longitudinal studies for the measurement of well-being.

2.1.3 Definition of terms

In categorising the longitudinal data available on well-being, we have distinguished between: data that relate directly to each of the four ONS subjective well-being questions and data with indirect salience to each. We have taken the same approach to data of relevance to each of the domains identified by ONS as directly affecting individual well-being.

For example, items categorised as *directly relating to* the ONS well-being domains use specific terms in a sufficiently close way to match the ONS domain. Also included here are cases where there may not be an explicit match between the question and the domain, but we believe that something very similar is being measured.

In other cases there is no straightforward link between the question and the domain as specified, but there is *indirect salience*. For example, with some further restructuring of the data, measures could be constructed which would be relevant to the domain in question.

Inevitably we have drawn more heavily on particular longitudinal studies in order to provide strong illustration of their potential. However, other longitudinal studies could also be mined extensively in this way.

2.1.4 Meeting the study objectives

This approach directly addresses three of the four aims specified for the scoping study and listed in Chapter 1. It covers the current state of play in respect of longitudinal datasets, including census-linked studies and reference is also made to the use of administrative records. The second aim, identifying longitudinal studies which might in the future act as vehicles for well-being information, is dealt with in the recommendations in the final chapter.

In addition, the information collected either in our questionnaire or through reviews of relevant websites, offers the following ways forward:

- It is a bespoke resource for those at ONS and elsewhere who seek to use longitudinal datasets for exploring well-being. The relevant items in the main datasets are identified and categorised with reference to the individual well-being domains developed by ONS, making it relatively straightforward for longitudinal information to be fed in. We present here the information we collected in summarised form. A separate appendix containing the full responses to the questionnaire is available directly from Longview (at www.longviewuk.com).
- In addition to the identification and classification of relevant questions, we also comment on how the data from these longitudinal studies can be applied to the study of well-being. The examples provided here could be built up into a valuable bank of material for the study of well-being, and we recommend that should happen.

2.2 Overview of the studies included in the review

There are four kinds of longitudinal data reviewed here. These include:

- birth cohort studies which follow up a sample of individuals from birth;
- household panel surveys which regularly follow-up some or all household members (over a specified age);
- longitudinal studies of individuals which begin in adolescence or adulthood; and
- census-linked studies which link key life events data and census data from a sample of individuals over time.

Figures 2.1 and 2.2 provide an overview of the studies included in this review.

2.2.1 Birth cohort studies

The large-scale birth cohort studies offer a very important source of longitudinal data on well-being as summarised in Figure 2.1. All of the birth cohort studies have information on cohort members' parents, as well as information on grandparents which includes, at the least, grandparents' educational attainment and recent or last occupation. The three older studies also have data on the offspring of the cohort members. In addition each study has made extensive use of data linkage to collect administrative information, for example about schools attended and deaths of sample members. Additionally, the new national birth cohort study currently under development will provide a new source of longitudinal cohort data on well-being in the future.

2.2.2 Household panel surveys

As shown in section a of Figure 2.2, the ongoing large national longitudinal household panel surveys are represented here by the British Household Panel Survey and its successor Understanding Society, as well as by the Wealth and Assets Survey and the now completed Families and Children Study.

2.2.3 Individual longitudinal studies beginning after childhood

The next type of longitudinal study shown in section b of Figure 2.2 is concerned with individuals and data collection that begins after childhood. This type is represented here by five ongoing studies: the English Longitudinal Study of Ageing; the Life Opportunities Survey; the Longitudinal Study of Young People in England; the Whitehall2 Study; and UK Biobank. Two further studies which are now completed are also included here- the 2007 West of Scotland Study, and the West of Scotland Teenage Health Study.

2.2.4 Census-linked studies

The third type of longitudinal study (see section c in Figure 2.2), uses census-linked administrative records combined with vital events data. Included here are the ONS Longitudinal Study covering England and Wales, the Scottish Longitudinal Study and the Northern Ireland Longitudinal Study.

Figure 2.1 Overview of the birth cohort studies included in the review

Year of beginning	Number of respondents at follow-up onset, and geographical coverage	Number of respondents and age at most recent follow-up	Number of data collections from total sample birth-20 yrs.	Number of data collections from total sample 21-65 yrs.	Study web address
1946 (NSHD)	5,362 in England, Wales & Scotland	3,035 (at 60-64 yrs.)	13	12, and 10 in the Women’s Health Study (N=1,572) and 4 in the Offspring Study(N=2,205)	www.nshd.mrc.ac.uk
1958 (NCDS)	17,634 in England, Wales & Scotland	9,790 (at 50 yrs.)	5	6, and 1 in the Offspring Study (N=4,800)	www.cls.ioe.ac.uk
1970 (BCS70)	17,287 in England, Wales, Scotland & Northern Ireland	9,665 (at 34 yrs.)	4	3, and 1 in the Offspring Study (N=5,200)	www.cls.ioe.ac.uk
1991-2 (ALSPAC)	14,451 in Avon County, England	7,942 (at 18 yrs.)	20	Not applicable	www.bristol.ac.uk/alspac
2000-1 (MCS)*	18,819 in England, Wales, Scotland & Northern Ireland	15,590 (at 10 yrs.)	4	Not applicable	www.cls.ioe.ac.uk

*sample stratified to boost ethnic minority representation

Figure 2.2. Overview of household panels, studies of individuals and census-linked studies included in the review

Study name and identification used in this report	Initial number. and age of respondents unless otherwise specified	Number of data collections	Study type and geographical coverage	Relevant website
a. Household panel studies				
British Household Panel Study (BHPS)	5,500 households, 10,300 individuals aged 16 yrs and over.	Annual waves 1 (1991) to 18 (2008)	Household panel in England Wales, Scotland & N. Ireland	www.understandingsociety.org.uk
Understanding Society (USoc)*	40,000 households, 100,000 individuals aged 10 yrs and over	Annual waves beginning in 2009	Household panel in England, Wales, Scotland & N. Ireland	
Wealth and Assets Survey (WAS)	30,595 households	3, the first in 2006-2008	Household panel in England, Wales & Scotland	www.esds.ac.uk/government/
Families and Children Study (FACS)	5,888 at final wave of data collection in 2008	10, the first in 1999	Household panel in England, Wales & Scotland	www.natcen.ac.uk
b. Studies of individuals beginning in adolescence or adulthood				
English Longitudinal Study of Ageing (ELSA)*	12,100 individuals aged 50 and over	6 bi-annual data collections beginning in 2002	Longitudinal study of individuals in England	www.fs.org.uk/elsa
Life Opportunities Survey (LOS)	31,161 adults (16+yrs) and 2,910 children (11-15yrs)	2, the first in 2009 with a third planned for 2012	Longitudinal study of individuals within households in England, Wales & Scotland	www.esds.ac.uk/government/los
Whitehall2 Study	10,380 non-industrial London based civil servants aged 35-55yrs	9 from recruitment in 1985-88 to 2012-13: data available for waves 1 to 8	Longitudinal study of individuals working in London	whitehall2@public-health.ucl.ac.uk
UK Biobank	500,000 individuals	Initial health examination beginning in 2006-10 and follow-up through postal/e-mail questionnaires and medical records	Longitudinal study of individuals recruited at ages 40-69yrs in England, Wales & Scotland	www.biobank.ac.uk
Longitudinal Study of Young People in England (LSYPE)*	15,770 individuals at age 13-14yrs	7 waves annually from 2004 to 2011, ages 17-18yrs	Longitudinal study of young people in England*	www.education.gov.uk/ilsype
WoS 2007 Study	Three cohorts aged at outset: 15 yrs (N=2,539) 35 yrs (N=2,518) 55 yrs (N=3,209)	5 from 1987 to 2007 5 from 1987 to 2007 5 from 1987 to 2007	Longitudinal study of individuals in West of Scotland	www.sphsu.mrc.ac.uk
WoS Teenage Health Study	2,586 at outset Adolescent cohort begun at 11-16 yrs and completed at 18-20 yrs	4 from 1994 to 2004	Longitudinal study of individuals in West of Scotland	www.sphsu.mrc.ac.uk

c. Census-linked studies				
ONS Longitudinal Study - England & Wales	529,764 individuals	4 from 1971 to 2001 and from continuous administrative and medical data sources	Longitudinal study of individuals and their households In England & Wales	www.statistics.gov.uk/services/longitudinal.asp
The Scottish Longitudinal Study	265,321 individuals	2 from 1991 and from continuous administrative and medical data sources	Longitudinal study of individuals and their households in Scotland	http://www.lscs.ac.uk/sls/data.htm)
The Northern Ireland Longitudinal Study	448,949 individuals	1 from 2001 and from continuous administrative and medical data sources	Longitudinal study of individuals and their households in N. Ireland	www.nisra.gov.uk/nils/index.htm

*includes an ethnic minority boost sample or ethnic minority oversampling

2.3 The period covered by the longitudinal data reviewed

The studies reviewed here collectively cover all but the first year of the 66-year post-war period (1946 to the present). Additionally, information on the grandparents of oldest birth cohort members extends back to the first half of the twentieth century.

To set the context for this longitudinal data, the post-war period was a time of fundamental social and economic change and policy innovation, including the introduction of the National Health Service (1948), the 1944 Education Act and many aspects of the welfare state. It began as a time of austerity and deep inequalities across a wide range of areas, including occupation, income, housing, education and health. It was also a time of social mobility as science and technology changed the nature of work. What followed was a period of relative affluence as the national economic position improved, and purchasing power, material circumstances, and opportunities to participate in further and higher education increased. However, this picture was reversed somewhat in the late 1970s when inequalities in these same areas tended to increase and social mobility decreased.²⁵

Although there is no consistent national information available on self-assessed well-being over this period, there are nevertheless more general indications of the national mood for the early part of the post-war period. Historians comment on the prevailing optimism of the early post-war years, which were a time of practically full employment, increasing employment of women, newly assured benefits of free health care, national insurance, family and maternity allowances, new and free opportunities for higher education and social mobility, increasing purchasing power, and improvements in housing.²⁶

Later in the post-war period, as inequalities increased, there began to be information on subjective well-being in cross-sectional studies of representative samples, such as the British Social Attitudes Survey which began in 1983. The five large scale birth cohort studies and the key national household panel survey (which began as the British Household Panel Survey in 1991 and continues now as Understanding Society) also have individual well-being data in increasing quantities from then onwards, and information on components of well-being from earlier times.

2.4 Longitudinal data on individual subjective well-being

Having set the historical context covered by the longitudinal studies in the review, we turn now to consider the data available from these studies on the ONS subjective well-being questions. Although we have not gone into great detail about the comparability of questions, in this section we provide the wording used.

²⁵ Atkinson AB. & Salverda W. (2005) 'Top incomes in the Netherlands and the United Kingdom over the 20th century', *Journal of the European Economic Association*, 3, 883-913. Bukodi E. & Goldthorpe J. (2011) 'Social class returns to higher education: chances of access to the professional and managerial salariat for men in three British birth cohort studies.' *Longitudinal and Life Course Studies*, 2, 185-201. Dorling D. (1997) *Death in Great Britain: how local mortality rates have changed 1950s-1990s*. York: Joseph Rowntree Foundation. McCulloch G. (2011) 'Education, policy and practice', in M. Wadsworth & J. Bynner (eds.) *A companion to life course studies: the social and historical context of the British birth cohort studies*, pp. 69-90, London: Routledge. Wilkinson RG. & Pickett K. *The spirit level: why equality is better for everyone*. London: Penguin.

²⁶ Pinto-Duschinsky (1970) 'Bread and circuses?' in V. Bogdanor & R. Skidelsky (eds.) *The age of affluence, 1951-1964*. London: Macmillan. Thomson D. (1981) *England in the twentieth century*, London: Penguin. Marwick A. (1982) *British society since 1940*. London: Penguin.

This should enable those interested in doing research in this area to explore the comparability of wording and coding with the ONS questions before deciding which longitudinal data sources to use for analysis.

Figure 2.3 shows for each of the four ONS questions on individual subjective well-being the ages at which similar data exist in the birth cohort studies. Data on this topic began to be collected regularly in the birth cohort studies from the early 1990s, but there are one or two items of information from earlier times. Each study has questions which cover the past and the future, asking for instance how satisfied with their lives respondents had been ten years ago, and how satisfied they expected to be in ten years' time.

Across the birth cohort studies there are measures covering aspects of well-being for a substantial period of the life course (13 to 60-64 years in the 1946 cohort, 33 to 50 years in the 1958 cohort, 16 to 34 years in the 1970 cohort and up to age 7 years in the 2000-1 cohort). In each cohort study, questions were asked about aspects of well-being at the beginning, middle and end of these periods and this makes it possible to examine life course trajectories of well-being. The 1946, 1958 and 1970 studies also contain some repeated questions so that change with age can be examined directly.

In addition each of the studies used measurement scales concerned with life satisfaction, as well as scales in which some item is directly concerned with an aspect of well-being covered by the four ONS subjective well-being questions. For example, the CASP-19 scale has questions about self-realisation and pleasure, and the SF36 scale asks about happiness. These dimensions offer additional opportunities for comparisons between the cohorts.

A summary of data on the four ONS subjective questions that originates from longitudinal studies other than the birth cohorts is given in Figure 2.4. Key points to note:

- Whitehall2 has the most consistent longitudinal data relevant to all four of the questions.
- ELSA has similar but so far one-off data, although the four questions will be included in the next wave (2012-13).
- UK Biobank has also collected information on three of the question areas, but so far only as one-off questions.
- The Scottish 2007 study consistently collected data from each of its three cohorts on the first ONS question, thus giving data at five ages (15, 18, 23, 28 and 35 yrs in the first cohort, 35, 38, 42, 48 and 55 yrs in the second cohort, and 55, 58, 62, 68 and 75 yrs in the third cohort). Therefore, these three age cohorts which constitute the Scottish 2007 study provide material for exploring the trajectory of individual well-being in relation to age.
- The continuing national household panel studies (British Household Panel Survey (BHPS) and Understanding Society (USoc) provide data relevant to all four ONS questions involving the consistent use of specific measurement scales. These provide data from large samples across wide age ranges, which would be ideal for the study of variation in ratings in relation to events experienced.
- The Wealth and Assets Survey (WAS) included the four ONS questions from mid 2011 (wave 3) and is expected to continue to include the questions in subsequent waves. This can be used to analyse subjective well-being in relation to personal and household financial circumstances.

- The Families and Children Study (FACS) has data relevant to three of the questions. This can be used to study parents' ratings of well-being for themselves and their children and how this varies with other aspects of family life and health. The Longitudinal Study of Young People in England (LSYPE) also has relevant data on subjective well-being collected at the age of 19.

The available longitudinal data which relates to each of the four ONS questions on subjective well-being is summarised in Figures 2.5a to 2.5d. Additionally, Figure 2.6 provides a summary of longitudinal studies containing prospective and retrospective self-assessments of the related issue of life satisfaction. All of these figures can be found at the end of the chapter.

2.5 Summary

- Eighteen longitudinal studies were reviewed to identify sources of data on subjective well-being.
- Five birth cohort studies, seven studies beginning in adolescence or adulthood (of which four are ongoing), and three household panel studies (of which two are ongoing) all have relevant data; the three census-linked studies do not have relevant data on subjective well-being but do offer extensive objective data relevant to well-being.
- The older birth cohort studies have consistent data on this topic which covers the life course from early adulthood to the early sixties, beginning in 1982. The most recent birth cohort (MCS, 2000-01) has data for the first ten years of life, and the other large studies of individuals or households collectively cover all of the life course, beginning in 1985-88.
- Among the ongoing studies the widest coverage and most consistent longitudinal data in relation to the four ONS subjective well-being questions can be found in the three oldest birth cohorts, as well as Whitehall2, ELSA and BHPS and Understanding Society. The Wealth and Assets Survey has also included all of the questions since wave 3 (mid 2011) and is expected to continue to do so in future waves. Finally, the Biobank study has strong potential because the baseline data (which has recently become available) includes questions similar to three of the four ONS subjective well-being questions.

2.6 Conclusions

The eighteen longitudinal studies reviewed here show the rich outcome of policy, administrative, academic and health care requirements for longitudinal data over the years since the end of the Second World War. They were selected for review because of their large sample sizes and the length of time over which data relevant to individual well-being had been collected. In most cases, they contain data on a range of aspects of well-being. Although only a few of these longitudinal studies have so far used the exact wording of the four ONS subjective well-being questions, many have similar data. All the studies also have a wide range of variables that can be used for explanatory purposes in analysis in which subjective well-being is an outcome.

Other longitudinal studies involving more specialist bio-medical investigations have not been included here, but do have information on specific aspects of well-being, particularly in later life. They include, for example, the MRC Cognitive Function and Ageing Study, the Lothian 1921 Birth Cohort Study, the

Hertfordshire Cohort Study and the Hertfordshire Ageing Study, the Boyd Orr Cohort Study, the Aberdeen Cohort Study, and the Caerphilly Prospective Study.²⁷

The eighteen longitudinal studies reviewed in this report are a ready and cost-effective resource for investigation into the antecedents and outcomes of subjective well-being as well as the distribution of well-being across the population, throughout the life course and over a long historical period. They also provide the opportunity to test the validity of the ONS subjective well-being measures.

Although most of the studies have the potential to collect new data on subjective well-being, we suggest that the most effective vehicle for the ONS questions would be Understanding Society, the national household panel study. This is because it has a large sample with a broad age inclusion, UK geographical coverage, an ethnic minority boost sample, annual data collections and existing data on well-being from 1991 onwards. If UK Biobank continues to include questions on subjective well-being, this would also be a good source of longitudinal well-being data.

Finally, longitudinal studies of ageing such as the English Longitudinal Study of Ageing (ELSA) would be good vehicles for the four subjective well-being questions because of their concentration on the growing later life sector of the national population. There are already plans to include the ONS subjective well-being questions in the next wave of the ELSA study. There are ongoing discussions about whether to begin a new longitudinal study of ageing in Scotland (Health and Ageing in Scotland or HAGIS) and a similar study is currently under development in Northern Ireland (NICOLA). Both would be similar to ELSA and it would be useful if each included the ONS well-being questions to enable comparative research.

²⁷ www.halcyon.ac.uk

Figure 2.3. The birth cohort studies' data on the four ONS question topics

ONS question	Exact or very similar wording	Similar wording	Specific scales used
Overall how satisfied are you with your life nowadays?	1958 cohort 33, 37**, 42, 46, 50 yrs 1970 cohort 21**, 26, 30, 34 yrs 2000-01 cohort: mother and father at child ages 9mth, 2yrs	1946 cohort 48 yrs* 2000-01 cohort 7, 10yrs	<i>Warwick/Edinburgh Mental Wellbeing Scale</i> and <i>Diener Life Satisfaction Scale</i> in 1946 cohort at 60-64 yrs and in Women's Health Study the <i>Ryff Scale of Psychological Wellbeing</i> at 52yrs <i>Warwick/Edinburgh Mental Wellbeing Scale</i> in 1958 cohort at 50 yrs.
Overall how happy did you feel yesterday?	1946 cohort 13, 15 yrs 1958 cohort 50 yrs 1970 cohort 34 yrs.	1946 cohort 26, 36, 53 yrs 1958 cohort 33 yrs 2000-01 cohort: mother's and father's own happiness at child ages 9mth, 2, 4, 7yrs: mother on child happiness at 4, 7yrs	<i>CASP-19 Quality of Life Score</i> 1958 cohort 50 yrs <i>Harter Scale 'The Perceived Competence Self-Completion Scale for Children aged 10-16 yrs'</i> in 1958 cohort 33yrs and 1970 cohort 34 yrs.
Overall how anxious did you feel yesterday?	1946 cohort 13, 15, 26 yrs		<i>Present State Examination</i> in 1946 cohort 36 yrs and <i>Psychiatric Symptom Frequency Questionnaire</i> at 43 yrs, and <i>General Health Questionnaire</i> at 53 yrs and <i>SF36 scale</i> at 60-64 yrs <i>Malaise Inventory</i> in the 1958 cohort at 23, 33, 42 and 50**yrs , in the 1970 cohort at 26, 30 and 34**yrs
Overall to what extent do you feel things you do in your life are worthwhile?		1946 cohort 36, 52* yrs 1958 cohort 33, 37**, 42, 46, 50 yrs. 1970 cohort 16, 21**, 26, 30, 34 yrs.	

*1946 study women only (n=1,382). **1958 and 1970 studies 10% sample only (1958 cohort n=1,700, 1970 cohort n=1,650)

Note: There was no data available on these topics in the ALSPAC study.

Figure 2.4 Data from household panel and other longitudinal studies related to the four ONS subjective well-being questions

ONS question	Exact same or very close wording	Similar wording	Specific scales used
Overall how satisfied are you with your life nowadays?	WoS 2007 study all 3 cohorts at all 5 data collections LSYPE at 19yrs ELSA planned for wave 6 (2012-13) WoS Teenage Health Study at 19yrs WAS at wave 3 (from 2011) and in future waves	Questions to youth in the BHPS and USoc , in Biobank at all ages, and in Whitehall2 at waves 1, 5, 7	<i>GHQ-12 and CASP-19</i> BHPS and USoc all waves <i>CASP-19, CES-D</i> : in ELSA all waves: <i>Diener Life Satisfaction Scale</i> in ELSA waves 2-6: <i>GHQ-12</i> in ELSA waves 1 & 3: <i>PANAS-X</i> in ELSA wave 5 <i>Ryff Scale of Psychological Wellbeing</i> ELSA wave 2*. Whitehall2 Study <i>GHQ-30</i> (all waves except 4) <i>SF-36</i> all waves 3 onwards
Overall how happy did you feel yesterday?	ELSA , planned for wave 6 (2012-13) WAS at wave 3 (from 2011) and in future waves	Questions to youth BHPS and USoc , in Biobank all ages, in FACS 2008, and Whitehall2 phase 1	<i>CASP-19</i> and <i>Short Warwick-Edinburgh Mental Well-being Scale</i> (7 items) in BHPS and USoc <i>CES-D</i> , and <i>CASP-19</i> in ELSA all waves <i>Diener Life Satisfaction Scale</i> in ELSA waves 2 to 6 <i>GHQ-12</i> in ELSA waves 1 & 3 <i>PANAS-X</i> : in ELSA wave 5: <i>Time Use and Emotions Scales</i> in ELSA wave 6: <i>Ryff Scale of Psychological Wellbeing</i> ELSA wave 2*. <i>GHQ-30</i> (all waves except 4) and <i>SF-36</i> (wave 3 onwards) in Whitehall2
Overall how anxious did you feel yesterday?	ELSA , planned for wave 6 (2012-13) WAS at wave 3 (from 2011) and in future waves	Questions to youth in BHPS and USoc , WAS all ages, Biobank all ages, FACS 2008, and Whitehall2 phase 1	<i>Short Warwick-Edinburgh Mental Well-being Scale</i> (7 items) in BHPS and USoc . <i>CES-D</i> in ELSA all waves <i>GHQ-12</i> in ELSA waves 1 & 2, <i>PANAS-X</i> in ELSA wave 5. <i>Time Use and Emotions Scales</i> in ELSA wave 6. <i>GHQ-30</i> and <i>SF-36</i> . <i>GHQ-30</i> (all waves except 4) and <i>SF-36</i> (wave 3 onwards) in Whitehall2
Overall to what extent do you feel things you do in your life are worthwhile?	ELSA , planned for wave 6 (2012-13) WAS at wave 3 (from 2011) and in future waves	FACS 2008, and Whitehall2 phase 1	<i>GHQ-12</i> and <i>Short Warwick-Edinburgh Mental Wellbeing Scale</i> (7 items) in BHPS and USoc . <i>Diener Life Satisfaction Scale</i> ELSA waves 2 to 6. <i>CASP-19</i> and <i>CES-D</i> in ELSA all waves. <i>GHQ-12</i> in ELSA waves 1 & 2. <i>Ryff Scale of Psychological Wellbeing</i> ELSA wave 2*. <i>SF-36</i> . <i>GHQ-30</i> (all waves except 4) and <i>SF-36</i> (wave 3 onwards) in Whitehall2

*10% subsample only

Figure 2.5a Sources of longitudinal data similar to ONS subjective well-being question: 'Overall how satisfied are you with your life nowadays?'

Study name	Questions asked	Ages/wave number when asked
1946 cohort	Is your life better or worse than that of other women of the same age? On the whole would you describe the last year as a very good year for you/fairly good/neither particularly good or bad/ quite bad/very bad year? <i>Warwick-Edinburgh Mental Well-being Scale</i>	48yrs 48-54yrs 60-64yrs
1958, 1970 2000-01 cohorts	How satisfied or dissatisfied are you with the way life has turned out so far? (analogue scale 0-10). Feelings about life and school: 13 items: Happy, worried, sad etc. Categorized All the time/ some of the time/ never. How satisfied are you with yourself?	1958 cohort 33, 37, 42, 46, 50yrs and 1970 cohort 21, 26, 30, 34yrs 2000-01 cohort 7 10yrs 2000-01 mother and father at child age 9mth, 7yrs
WoS 2007 Study & WoS 11-16	I would like to ask you how you feel about your life in general. Looking at the faces scale, which face shows best how you feel about your life as it is now? (7 faces)	Asked at all waves in all 3 cohorts of 2007 study and at 19yrs in the WoS Teenage Health Study
LSYPE	How dissatisfied or satisfied are you about the way your life has turned out so far?	19yrs
Whitehall2	I am satisfied with my life (1-7 scale). All things considered how satisfied/dissatisfied are you with your life as a whole? (1-7 scale). I feel satisfied with the way my life had turned out (1-4 scale). <i>GHQ-30</i> <i>SF-36</i>	Wave 1 Waves 5 and 7 Wave 7 All waves except 4 All waves from 3 onwards
FACS	Which face best describes how you feel about your life as a whole(7 faces)	Child questionnaire in wave 10
ELSA	Exact question planned for 2012-13 <i>CASP-19, CES-D:</i> <i>Diener Life Satisfaction Scale,</i> <i>GHQ-12,</i> <i>PANAS-X,</i> <i>Ryff Scale of Psychological Wellbeing *</i>	Wave 6 at 60+ years All waves Waves 2-6 Waves 1 & 3 Wave 5 Wave 2*
BHPS	<i>GHQ-12, CASP-19, Warwick-Edinburgh Mental Wellbeing Scale</i> and specific questions	All contacts
USoc	<i>GHQ-12, SF-12,</i> specific questions and <i>Short Warwick-Edinburgh Mental Wellbeing Scale</i>	All contacts
WAS	Exact question	Wave 3
LOS	Exact question planned for 2012	Wave 3 at 19+ years in adult sample, 14-18 years in younger sample

Figure 2.5b Sources of longitudinal data similar to ONS subjective well-being question: 'Overall how happy did you feel yesterday?'

Study name	Questions asked	Ages/wave number when asked
1946 birth cohort	Which statement best describes this child: Unusually happy and contented/Generally cheerful and in good humour/ Usually gloomy and sad On the whole how happy would you say you were with your job? Very happy/fairly happy/not very happy/unhappy	13, 15yrs 26, 53yrs
1958 cohort	<i>Harter Scale</i> How happy are you? Very happy/fairly happy/not very happy/not at all happy: and <i>CASP Scale</i>	33yrs 50yrs
1970 cohort	<i>Harter Scale</i>	34yrs
2000-01 cohort	How happy are you? How happy are you with your life so far?	7, 10yrs Mother and father at child ages 9mth, 2, 4, 7yrs
Whitehall2	Have you recently been feeling reasonably happy, all things considered? (1-4 scale) <i>GHQ-30</i> <i>SF-36</i>	Phase 1 All waves except 4 All waves from 3 on
FACS	I find it stressful combining work and family life (card sort of factors why)	Wave 10 in 2008
ELSA	Exact question planned for 2012-13 <i>CES-D, CASP-19</i> <i>Diener Life Satisfaction Scale</i> <i>GHQ-12</i> <i>PANAS-X</i> <i>Time Use and Emotions Scales</i> <i>Ryff Scale of Psychological Wellbeing</i>	Wave 6 at 60+ years All waves Waves 2 to 6 Waves 1 & 3 Wave 5 Wave 6 Wave 2*
BHPS	<i>GHQ-12</i> and <i>CASP-19</i> and <i>Warwick-Edinburgh Mental Wellbeing Scale</i> and Questions about aspects of happiness e.g. 'Are you happy with your appearance?' Questions about aspects of happiness, as above	Adult contacts Youth questionnaire
USoc	<i>GHQ-12</i> and <i>SF-12</i> and specific questions about aspects of happiness, as in BHPS entry above	Adult contacts Youth questionnaire
WAS	Exact question	Wave 3
LOS	Exact question planned for 2012	Wave 3 at 19+ years in adult sample, 14-18 years in younger sample

Figure 2.5c Sources of longitudinal data similar to ONS subjective well-being question: 'Overall how anxious did you feel yesterday?'

Study name	Questions asked	Ages/wave number when asked
1946 cohort	Which statement best describes this child: a dare-devil/as cautious as the average child/extremely fearful? Quarrelsome and aggressive/average, not particularly quarrelsome/timid? Would you say that in your home and personal life/working life you are under severe nervous strain/some nervous strain/ little or no nervous strain? <i>Present State Examination</i> <i>Psychiatric Symptom Frequency</i> <i>GHQ</i> <i>SF36</i>	13, 15yrs 26yrs 36yrs 43yrs 53yrs 60-64yrs
1958 cohort	<i>Malaise Inventory</i> <i>Warwick-Edinburgh Mental Wellbeing and SF36 Scales</i>	22, 33, 42, 50yrs 50yrs
1970 cohort	<i>Malaise Inventory</i> <i>Kessler (K10) Psychological Distress Scale</i>	26, 30, 34yrs 34yrs
2000-01 cohort	<i>Goodman Strengths and Difficulties Questionnaire</i>	Asked of mother at child ages 3, 5, 7yrs and teacher at child age 7
Whitehall2	<i>GHQ-30</i> <i>SF-36</i>	All waves except 4 All waves from 3 onwards
ELSA	Exact question planned for 2012-13 <i>CES-D</i> <i>GHQ-12</i> <i>PANAS-X</i> <i>Time Use and Emotions Scales</i>	Wave 6 at 60+ years All waves Waves 1 & 2 Wave 5 Wave 6
BHPS	<i>GHQ-12 and CASP-19 and Warwick-Edinburgh Mental Wellbeing</i>	All adult contacts
WAS	Exact question	Wave 3
LOS	Exact question planned for 2012	Wave 3 at 19+ years in adult sample, 14-18 years in younger sample

Figure 2.5d Sources of data similar to ONS subjective well-being question: 'Overall to what extent do you feel things you do in your life are worthwhile?'

Study name	Questions asked	Ages/wave number when asked
Whitehall2	Exact question	Wave 1 at 35-55 years
ELSA	Exact question planned for 2012-13	Wave 6 at 60+ years
LOS	Exact question planned for 2012	Wave 3 at 19+ years in adult sample, 14-18 years in younger sample
WAS	Exact question	Wave 3 (mid 2011) onwards

Figure 2.6. Life satisfaction in retrospect and prospect

Study name	Questions asked	Ages asked
1946 cohort	Would you say that on the whole life has been good to you? Looking back over life as a whole is there anything you wish now that you'd done differently in your education/working life/family life?	36 yrs
1958 and 1970 cohorts	Looking back how satisfied are you with life and your personal happiness? How satisfied or dissatisfied are you with the way life has turned out? How satisfied were you with your life ten years ago? How satisfied do you expect to be in ten years time?	1958 cohort 33, 37*, 42, 46, 50yrs 1970 cohort 21*, 26, 30, 34yrs 1958 cohort 33yrs 1958 cohort 33, 37*, 42, 50yrs and 1970 cohort 21*, 30, 34yrs
Whitehall2	If I could live my life over again I would change almost nothing (1-7 scale) <i>GHQ-30</i> <i>SF-36</i>	Wave 1 All waves except 4 All waves from 3 on
WoS Teenage Health Study	Which face shows best how you feel about the future? (5 faces)	11, 13, 15yrs
ELSA	Exact question wording planned to be used in 2012-13 <i>Diener Life Satisfaction Scale</i> <i>CASP-19, CES-D</i> <i>GHQ-12</i> <i>Ryff Scale of Psychological Wellbeing</i>	Wave 6 Waves 2 to 6 All waves Waves 1 & 2 Wave 2*

*10% subsample

Chapter 3 Longitudinal data for measuring the ONS well-being domains

3.1 Introduction and background

This chapter provides an overview of the longitudinal data available in each of the domains identified by ONS as directly affecting individual well-being. These include:

- Our relationships;
- Health;
- What we do;
- Where we live;
- Personal finance; and
- Education and skills.

A further three domains are considered by ONS to be more contextual and are therefore not included in the review. These are:

- Governance;
- The economy; and
- The natural environment.

The focus of this chapter is on satisfaction in each domain. For example, we identify measures of satisfaction with current partnership or relationship which could be used to provide data for the 'Our relationships' domain. Overall, it is important to note that while most of the studies reviewed have data on the factual details of each sample member's situation in each domain, there is less information available about satisfaction with the situation.

As with the previous chapter, we begin by exploring the data available in each domain from the birth cohort studies and then go on to consider relevant data available from other longitudinal studies.

3.2 Our relationships: longitudinal data on satisfaction with personal relationships and social life

This domain focuses on the extent and type of the individual's relationships to their immediate family, their friends and the community around them. As shown in Figure 3.1, the older birth cohort studies all have extensive data about partnerships, family relationships and social life, but they have much less data on satisfaction with these areas. Figure 3.2 provides a summary of the data on personal relationships and social life available from other (non birth cohort) longitudinal studies.

3.2.1 Data on satisfaction with partner relationships

Each of the older birth cohort studies (1946 and 1958 cohorts) has data about respondents' satisfaction with current partnerships and with their relationships with parents. Information is available on both of

these topics covering the period from 1991 to 2011. In life course terms the 1946 and 1958 studies have data covering a substantial period of cohort members' adult lives (in the 1946 cohort from age 43 to 60-64 years and with retrospective data about childhood and adolescence: in the 1958 cohort from 33 to 50 years).

Looking at the newer birth cohorts, the Millennium Cohort Study (2000-2001 cohort) has data about the relationship between the cohort member's mother and her partner(s) from the cohort child's birth to the age of 10. The Avon Longitudinal Study of Parents and Children (1991-2 cohort, ALSPAC) has similar data covering the whole childhood of cohort members.

Other sources of longitudinal data on satisfaction with partner relationships include the English Longitudinal Study of Ageing (ELSA) which has information spanning an 8 year period and including 4 waves of data. Data collection on this topic continues in ELSA on a two yearly cycle. Similarly, the 2007 West of Scotland Study has data on satisfaction with partnerships collected at 5 points in time from among each of the three cohorts in the study. This covers the life course periods of the three Scottish cohorts (15 to 35 years, 35 to 55years, and 55 to 75years) and extends over a 20 year period from 1985 to 2005. Whitehall2 has also collected data on satisfaction with partnership at three waves. UK Biobank and the West of Scotland Teenage Health Study each have one-off information on satisfaction with partner relations. Finally, data on partner relations has also been extensively collected in the national household studies (BHPS and USoc) from 1991 to the present.

3.2.2 Data on relationships between parents and children

Apart from satisfaction with parents, the 1946 birth cohort study also provides the opportunity to study life course change in cohort members' satisfaction with relationships with parents. During the same interview, data was collected from cohort members on current and retrospective satisfaction with parental relationships.

There are no real opportunities among the birth cohort studies to study life course change in relation to parental satisfaction with relationships with children and satisfaction with social life. Unfortunately, there have been only single collections of data on these issues.

Other longitudinal studies have collected more extensive data on relationships between parents and children. For example, the Longitudinal Study of Young People in England (LYSPE) asked parents about their relationship with the sample member, and sample members were asked directly about their relationship with their parents at age 13. Data on satisfaction about the relationship with parents was also collected four times between ages 11 and 19 years in the West of Scotland Teenage Health Study, from 1994 to 2002-04.

Longitudinal information on satisfaction with relationships with children is available in the Whitehall2, ELSA and LYSPE studies. It is also available in relation to non-resident children in the West of Scotland 2007 Study.

Data on satisfaction with social life was collected once in LYSPE, and is available longitudinally in ELSA, Whitehall2 and BHPS.

3.2.3 Data on satisfaction with the neighbourhood

Information on feelings of belonging in the neighbourhood was collected more than once in the adult lives of cohort members in each of the three older birth cohort studies. This makes it possible to study life course change in this respect over a 28 year period for the oldest cohort.

Looking at other longitudinal studies, data on satisfaction with the neighbourhood is available from ELSA and LSYPE (but was asked once only in the latter). Longitudinal data on neighbourhood trust was collected in ELSA, Whitehall2, and in each of the cohorts that make up the 2007 study (1985 to 2005), and in the West of Scotland Teenage Health Study. One-off data on this topic was also collected in LSYPE and FACS.

Figure 3.1 Our relationships: data collected on personal relationships in the birth cohort studies

Topic area	Self-reported data on this topic	Scales and measures
Satisfaction with current partner relationship	1946 cohort 43 yrs 1958 cohort 33, 42, 46, 50 yrs 1970 cohort 30yrs 1991-2 cohort mother when child aged 21, 33, 47months, 6, 8, 9, 12, 18yrs 1991-2 cohort male partners when child aged 21, 33months, 6, 8, 9, 12yrs 2000-01 cohort: mother when child aged 9 months, 2, 7yrs	1946 cohort <i>Close Person Questionnaire</i> at 60-64 yrs.
Satisfaction with relationship with own children	1946 cohort at 52 yrs* 1991-2 cohort at 8 months and 7yrs	None
Satisfaction with relationship with own parents	1946 cohort at 43 yrs 1958 cohort 42yrs 1970 cohort 30yrs	1946 cohort <i>Parental Bonding Questionnaire</i> at 43 yrs (retrospective about relationship with parents up to 16 yrs)
Satisfaction with social life	1946 cohort at 43, 53, 60-64 yrs 1991-2 cohort at unspecified age	None
Trust in other people in your neighbourhood	1970 cohort at 34yrs	None
Other relevant information on this topic	1946 cohort 43 yrs retrospective review of family life and personal relations 1991-2 cohort mothers' retrospective questions on own childhood 0-5, 6-11, 12-15yrs	None

*1946 study women only (n=1,382). **1958 and 1970 studies, 10% sample only (1958 cohort n=1,700, 1970 cohort n=1,650)

Figure 3.2 Our relationships: data collected on personal relationships in other longitudinal studies

Topic area	Self-reported data on this topic	Scales and measures
Satisfaction with current partner relationship	Biobank all asked once WoS 2007 Study in all 3 cohorts at all waves from wave 2 onwards WoS Teenage Health Study 19 yrs ELSA all waves Whitehall2 waves 1, 3, 7	BHPS: Short Warwick-Edinburgh Mental Well-being Scale about family and friends asked of 3 youth waves USoc: Short Warwick-Edinburgh Mental Well-being Scale to adults: <i>SF-12</i> to young people about family and friends ELSA: loneliness questions asked of waves 2 to 6
Satisfaction with relationship with own children	WoS 2007 Study only asked of non-resident children LSYPE parents asked when sample aged 13, 14, 15yrs ELSA all waves Whitehall2 waves 1, 7	None
Satisfaction with relationship with own parents	WoS Teenage Health Study 11, 13, 15, 19 yrs LSYPE 13yrs ELSA wave 3 (in retrospect) FACS 2008 wave Whitehall2 waves 1, 5	WoS Teenage Health Study: Parental Bonding Inventory at 11, 13, 15 yrs
Satisfaction with social life	LSYPE at 16yr ELSA wave 4 Whitehall2 waves 1, 2, 3	BHPS: GHQ-12 all waves ELSA: GHQ-12 at waves 1 & 3 and <i>Satisfaction with Life (Diener) Scale</i> at waves 2 to 6
Trust in other people in your neighbourhood	WoS 2007 Study from wave 1 in the 2 older cohorts and wave 2 in the younger cohort LSYPE 16 yrs ELSA all waves WoS Teenage Health Study at 15, 19 yrs FACS 2008 wave Whitehall2 waves 1, 2, 7	None
Other relevant information on this topic	WoS Teenage Health Study 15yr FACS 2008 wave	None

3.3 Health: longitudinal data on physical and cognitive development, physical and mental health, and disability

An individual's health is recognised as an important component of their well-being. This domain focuses both subjective and objective measures of physical and mental health.

The birth cohort studies all have extensive data on growth, physical and mental health, illness and disability, in the form of measures and clinically validated assessment scales. They also have self-reports of current health and treatments. Assessments of well-being in terms of health can therefore be very sophisticated, as can analysis taking account of the effects of current health. Clinically validated mental health scales provide data on the prevalence of depression and anxiety (and in some instances also on

suicidal thoughts). They provide an indication of anxiety and depression both in those in whom the condition has not been diagnosed and/or and in those in whom it has.

Figure 3.3 summarises the data available from the birth cohort studies on self-reported health as well as the specific health scales used. Within any one of the studies a life course profile of physical and mental health (e.g. growth and body shape trajectories, illness and disability history) can be constructed, beginning at birth and continuing into adulthood. Similarly, long-term profiles of self-reported health, chronic illness and disability, health and health treatment during the adult years can be established. Many comparative studies between the birth cohorts have already been undertaken, particularly exploring socio-economic differentials in growth.

Figure 3.4 summarises the data available on health and satisfaction with health collected in other longitudinal studies. Physical and mental health over a long period is well covered by the studies of individuals. These include: ELSA (2002 to the present); the UK Biobank study (2006 to the present); Whitehall2 (1985 to 2012); the 2007 Study (data collections from 1985 to 2005); the West of Scotland Teenage Health Study (data collections from 1994 to 2004); and LSYPE (data collections from 2004 to 2010). The household studies (e.g. BHPS and Understanding Society) also have data on satisfaction with health and on mental health covering the period from 1991 to the present.

Finally, the very large census-linked longitudinal studies in England and Wales, Scotland and Northern Ireland have data on fertility, cancer and cancer survival, and death from all causes for sample members of all ages. The ONS Longitudinal Study covers the 30 year period from 1971 to 2001 for a 1% sample of England and Wales. The Scottish Longitudinal Study covers the 10 years from 1991 to 2001 and includes a 5.3% sample of the Scottish population. The Northern Ireland Longitudinal Study contains data on 28% of the population of Northern Ireland, with data beginning in 1997. These datasets are expected to be updated with information from the latest Census in 2013.

Figure 3.3 Health: data available from the birth cohort studies

Topic area	Self-reported data on this topic	Scales and measures
State of physical health	<p>1946 cohort at 26, 36, 43, 53, 60-64yr, annually in the Women's Health Study 47-54, 57, 59 yrs.*</p> <p>1958 cohort 33, 42, 46, 50 yrs</p> <p>1970 cohort 26, 30, 34, 38 yrs</p> <p>1991-2 cohort at child ages 2, 8, 21, 33, 47 mths, and 5, 6, 8, 9, 11, 12, 18 yrs</p> <p>2000-01 cohort child age 9mth, 2, 4, 7yrs</p>	<p>All the birth cohort studies have many measures of physical health throughout life</p>
State of mental health in terms of anxiety and depression	None	<p>1946 cohort: <i>Maudsley Personality Inventory</i> at 16, 26yrs, <i>Present State Examination</i> at 36 yrs, <i>Psychiatric Symptom Frequency Questionnaire</i> at 43 yrs, <i>General Health Questionnaire</i> at 53, 60-64 yrs, <i>SF36</i> at 60-64 yrs</p> <p>1958 cohort: <i>Malaise Inventory</i> at 23, 33, 42, 50 yrs, <i>Warwick-Edinburgh Mental Well-being Scale</i> and <i>SF36</i> at 50yrs</p> <p>1970 cohort: <i>Malaise Inventory</i> at 26, 30, 34 yrs. and mothers of 1970 cohort when child aged 5, 10, 16yrs, and <i>Kessler Scale</i> at 34 yrs</p> <p>1991-2 cohort: <i>Edinburgh Postnatal Depression Scale</i> at child age 2, 8, 21, 33 months, 5, 6, 11yrs</p> <p><i>Moods & Feelings Questionnaire</i> at 10, 12, 13, 17yrs</p> <p>2000-1 study: <i>Strengths and Difficulties Questionnaire</i> and <i>Goodman Physical and Mental State Assessments</i> mothers at child ages 3, 5, 7 yrs: <i>Short Malaise Scale</i> at 9 months, 2, 4, 7yrs</p>
Self-(or parental) report of long-standing illness	<p>1946 cohort at 16, 19, 20, 22, 23, 25, 26, 36, 43, 53 yrs and in the Women's Health Study at 47-54 57 59 yrs</p> <p>1958 cohort at 7, 11, 16, 23, 33, 37**, 42, 50 yrs</p> <p>1970 cohort at 5, 10, 16, 21**, 26, 30, 34 yrs.</p> <p>1991-2 cohort at most ages 2000-1 cohort 3, 5, 7 yrs</p>	None

*1946 study women only (n=1,382). **1958 and 1970 studies 10% sample only (1958 cohort n=1,700, 1970 cohort n=1,650)

Note: No information was reported or found on questions about satisfaction with physical health, mental well-being, or retrospective satisfaction with health, or assessments of future health chances

Figure 3.4 Health: data available from other longitudinal studies

Topic area	Self-reported data	Scales and measures
State of physical health	Biobank all ages: ELSA all waves: Whitehall2 all waves: WoS 2007 Study at all waves: WoS Teenage Health Study 11, 13, 15, 19yrs: FACS in 2008 wave: LOS wave 1: WAS all ages	None
State of mental health in terms of anxiety and depression	Biobank all ages: ELSA all waves: Whitehall2 all waves: WoS Teenage Health Study 11, 13, 15, 19yrs: FACS in 2008 wave: LOS wave 1	BHPS: CASP-19, GHQ-12 and Short Warwick-Edinburgh Mental Well-Being Scale at all waves USOC: GHQ-12, SF-12, and Short Warwick-Edinburgh Mental Well-being Scale and Strengths and Difficulties Questionnaire ELSA: CES-D at all waves, GHQ-12 at waves 1 & 3 and Positive and Negative Affect (PANAS) Schedule at wave 5, and Ryff Scale of Psychological Wellbeing at wave 2* WoS 2007 Study: General Health Questionnaire and Hospital Anxiety & Depression Scale at all waves in oldest cohort and from wave 2 onwards in both younger cohorts WoS Teenage Health Study: selected items from the State-Trait Anxiety Inventory at 11yrs, Depressive Mood Scale at 11, 13, 15yrs, and GHQ-12 at 15, 19yrs Whitehall2: GHQ-30 all waves except 4, SF-36 all waves from 3 on, CESD waves 7, 9, Affect Balance Score waves 1, 2
Satisfaction with physical health	BHPS and USoc at all waves: Biobank all ages: Whitehall2 waves 1 and 3: LSYPE 14, 15, 16yrs: ELSA all waves	None
Satisfaction with mental well-being	Biobank all ages: ELSA all waves	ELSA: CASP19 Quality of Life Scale all waves Satisfaction with Life (Diener) Scale waves 2 to 6 Positive & Negative Affect Schedule (PANAS-X) at wave 5
Retrospective satisfaction with health	LSYPE 14, 15, 16yrs: ELSA all waves	None
Assessment of future health chances	WoS Teenage Health Study 11, 13, 15yrs: ELSA wave 2 onwards	Whitehall2: SF-36 wave 3 on
Self-(or parental) report of longstanding illness and/or disability	Biobank all ages: Whitehall2 all waves: WAS all ages: ELSA all waves: WoS 2007 Study all waves in oldest cohort and from wave 2 onwards in younger cohorts: LSYPE 13, 14, 15, 16, 17, 18, 19 yrs: WoS Teenage Health Study 11,13, 15, 19yrs: FACS 2008	None

*10% subsample in wave 2 only

3.3 What we do: longitudinal data on work and leisure time

In this domain the focus is on both subjective and objective measures of aspects of work and leisure activities and of work-life balance.

Figure 3.5 provides an overview of the information on aspects of work and leisure collected in the birth cohort studies.

Figure 3.5 What we do: data available from the birth cohort studies

Topic area	Self-reported data on this topic
Job satisfaction	1946 cohort 26, 36, 43, 53yrs 1958 cohort 37**, 42, 50yrs 1970 cohort 21**, 30, 34yrs 1991-2 cohort mothers and partners at child age 8, 21, 33mths, 5, 7, 10yrs 2000-01 mother at child age 7yrs
Satisfaction with working hours	2000-01 mother at child age 7yrs
Satisfaction with amount of leisure time	None
Satisfaction with job prospects	1946 study 26, 36, 43, 53yrs 1958 cohort 42yrs 1970 cohort 21**, 30yrs
Volunteering	1946 cohort 36, 43, 53yrs

**1958 and 1970 studies 10% sample only (1958 cohort n=1,700, 1970 cohort n=1,650)

The birth cohort studies collectively provide longitudinal data on satisfaction with occupation, income and job prospects over a 36 year period from 1972 to 2008, including the time of high risk of unemployment which began during the 1980s. In life course terms, the 1946 birth cohort study covers a 27 year period while the 1958 and 1970 cohorts each cover a 13 year period.

Both the 1991-92 cohort study (ALSPAC) and the 2000-01 cohort study (MCS) have collected data on job satisfaction from the cohort child's mother. MCS also has data on the mother's satisfaction with work and perceived work-life balance when the cohort child was aged 7 years.

Figure 3.6 summarises the relevant information available on work and leisure from the other sources of longitudinal data reviewed. Several studies cover these topics over a substantial period of 20 years or more. For example, Whitehall2 has data from 1985/88 to 2012; the 2007 West of Scotland Study includes the period from 1985 to 2005; and the BHPS/ Understanding Society household panel studies cover the period from 1991 to 2011. They also cover long periods of the life course.

Figure 3.6 What we do: data from other longitudinal studies

Topic area	Self-reported data on this topic
Job satisfaction	BHPS and USoc all waves Biobank all ages Whitehall2 waves 1, 3, 5, 7 WoS 2007 study 2 older cohorts ELSA all waves LSYPE 18, 19 years WoS Teenage Health Study 19 years FACS 2008 wave only in relation to child care
Satisfaction with working hours	ELSA all waves Whitehall2 all waves LSYPE 17yrs FACS 2008 wave only in relation to child care
Satisfaction with amount of leisure time	BHPS and USoc all waves Whitehall2 wave 1 ELSA all waves LSYPE 13, 14, 16yrs
Satisfaction with job prospects	None
Volunteering	ELSA all waves Whitehall2 waves 1, 5, 7, 8 WoS 2007 study 2 older cohorts LSYPE 18, 19yrs FACS 2008 wave LOS wave 1

3.4 Where we live: longitudinal data on accommodation and neighbourhood

This domain is about the area in which individuals live, including having a safe, clean and pleasant environment, access to facilities and being part of a cohesive community.

As shown in Figure 3.7, the birth cohort studies have relevant longitudinal data on three aspects of the ‘Where we live’ domain, with the greatest coverage focusing on satisfaction with accommodation. There is no longitudinal data available on how well people in the local area from different backgrounds get on or on the perceived level of trust among people in the area.

Figure 3.7 Where we live: data from the birth cohort studies

Topic area	Self-reported data on this topic
Satisfaction with accommodation	1946 cohort 19yr, 22, 36yrs 1958 cohort 33, 42, 46yrs 1970 cohort 30, 34yrs
Satisfaction with area	1946 cohort 36, 60-64yrs 1958 cohort 33, 42yrs 1970 cohort 30, 34yrs 1991-2 cohort asked of mother at child age 8 wks gestational age, 8, 21, 33 mths, 5, 7, 10yrs and asked of partner at child age 12wks gestational age, 5, 7, 10yrs
Feeling of belonging in the neighbourhood	1946 cohort 36, 43, 60-64yrs 1958 cohort 33, 42yrs 1970 cohort 30, 34yrs 2000-01 cohort mother at child age 9mth, 2yrs
Fear of crime in this area	1991-2 cohort asked of mother at child age 33 mths, 5, 7, 10yrs and of partner at child age 5, 7, 10yrs
How well people from different backgrounds get on together	None

Figure 3.8 provides a summary of the data available from the other longitudinal studies reviewed. It is more extensive than the data from the birth cohort studies. Indeed, both the household panel studies and the studies of individuals have regularly collected data on satisfaction with accommodation and with local area. Although six studies have data on fear of crime, only the 2007 West of Scotland study collected such information more than once. The Longitudinal Study of Young People in England also has one-off data on young people’s perceptions of their neighbourhood.

Figure 3.8 Where we live: data from other longitudinal studies

Topic area	Self-reported data on this topic
Satisfaction with accommodation	BHPS and USoc all waves Whitehall2 waves 1, 2, 3, 5, 7, 8 WoS 2007 study all waves in oldest cohort, wave 2 onwards in other 2 cohorts ELSA all waves FACS 2008 wave WoS Teenage Health Study 19 years LOS wave 1
Satisfaction with area	BHPS and USoc all waves WoS 2007 study all waves in oldest cohort, wave 2 onwards in other 2 cohorts LSYPE 17 years ELSA all waves Whitehall2 waves 1, 2, 3, 5 FACS 2008 wave WoS Teenage Health Study 19 years
Feeling of belonging in your neighbourhood	LSYPE 16 years ELSA all waves
Fear of crime in this area	WoS 2007 study all waves in oldest cohort, wave 2 onwards in other 2 cohorts LSYPE 16 years ELSA wave 3 Whitehall2 wave 7 FACS 2008 wave LOS wave 1
How well people from different backgrounds get on together	LSYPE 17 years

3.5 Personal finance: longitudinal data on personal and household income and personal assets

This domain focuses on income and wealth and its distribution. Analysis of these measures will be used to address the concepts of poverty and equality of income and assets.

Figure 3.9 provides an overview of the longitudinal data available from the birth cohort studies on satisfaction with personal finances. This domain is least well covered by the birth cohort studies compared to the other well-being domains.

Figure 3.9 Personal finance: data from the birth cohort studies

Topic area	Self-reported data on this topic
Satisfaction with personal income	1946 cohort 26, 36, 43, 53 yrs 1958 cohort 42, 50 yrs 1970 cohort 30 34 yrs
Satisfaction with household income	1946 cohort at 36, 43, 53, 60-64 yrs
Satisfaction with personal assets	None

Figure 3.10 provides an overview of the information available on personal finance from the non birth cohort studies. It shows that a range of longitudinal studies have some relevant data available for this domain area.

Figure 3.10 Personal finance: data available from other longitudinal studies

Topic area	Self-reported data on this topic
Satisfaction with personal income	WAS all ages LSYPE 18, 19yrs ELSA all waves Whitehall2 waves 1, 5 Biobank all ages
Satisfaction with household income	BHPS and USoc at all waves WoS 2007 study all waves in oldest cohort, wave 2 onwards in other 2 cohorts LSYPE parents when sample member 13 yrs ELSA all waves Biobank all ages Whitehall2 waves 1, 2, 3, 5, 7, 8 WAS all ages LOS wave 1
Satisfaction with personal assets	ELSA all waves Whitehall2 waves 1, 2, 3, 7

3.6 Education and skills: longitudinal data on education, attainment, skills and qualifications

The scope of this domain is levels of educational achievement, and skills. The birth cohort studies have a strong focus on education and each has extensive data on the experience of education, qualifications and skills. There is less longitudinal data on satisfaction with qualifications and educational attainment as this is only available in the 1946 cohort study. Both the 1958 and 1970 cohort studies include satisfaction with attainment, qualifications, literacy, numeracy and IT skills, and on adulthood aspirations for acquiring new skills and qualifications (see Figure 3.11). The 1946, 1958 and 1970 cohort studies also have data (not shown here) on the educational aspirations of cohort members for their first born child when they were young.

Figure 3.11 Education and skills: data from the birth cohort studies

Topic area	Self-reported data on this topic
Satisfaction with educational attainment	1946 cohort at 22, 26, 36 yrs
Satisfaction with qualifications	1946 cohort at 22, 26, 36 yrs
Satisfaction with literacy	1958 cohort 23,33 yrs 1970 cohort 30, 34 yrs
Satisfaction with numeracy	1958 cohort 23,33 yrs 1970 cohort 30, 34 yrs
Satisfaction with IT skills	1958 cohort 42, 46, 50 yrs 1970 cohort 30, 34, 38 yrs
Ambitions and aspirations for acquiring new skills/qualifications	1946 cohort 43 yrs 1958 cohort 42 yrs 1970 cohort 30, 34 yrs

Data from other longitudinal studies is shown in Figure 3.12. The British Household Panel Survey and its successor, Understanding Society, have the most consistent runs of data. The English Longitudinal Study of Ageing has longitudinal data on people aged fifty and over while the Longitudinal Study of Young People in

England has similar information on young people. Additionally, the census-linked longitudinal studies have information on educational attainment and on occupations (not shown here).

Figure 3.12 Education and skills: data from other longitudinal studies

Topic area	Self-reported data on this topic
Satisfaction with educational achievement	LSYPE 13, 14, 15 yrs
Satisfaction with experience of education	BHPS and USoc all waves LSYPE 13, 14, 15 16 yrs WoS Teenage Health Study 11, 13, 15 yrs
Satisfaction with qualifications	LOS wave 1
Satisfaction with literacy	None
Satisfaction with numeracy	None
Satisfaction with IT skills	None
Ambitions and aspirations for acquiring new skills/qualifications	LSYPE all waves ELSA all waves FACS 2008 wave 1 LOS wave 1

3.7 Summary

- Of the eighteen studies reviewed, fifteen have longitudinal data on satisfaction in most of the domains identified by ONS as directly affecting individual well-being. Only the three census-linked longitudinal studies have no data on satisfaction in these domains.
- Data from the studies reviewed covers many years of the life course, with the birth cohort data available from mid-adulthood to the early sixties. The other longitudinal studies reviewed collectively provide data covering all periods of life.
- The historical period covered by the data includes the last 27 years, with birth cohort data beginning consistently in 1989 and data from the other longitudinal studies beginning in 1985.
- Longitudinal data on satisfaction in these domains is more consistent in some areas than others. The birth cohort studies are least strong on satisfaction with health and personal finance. None of the studies are strong on satisfaction with relationships between parents and children.

3.8 Conclusions

Although longitudinal data on satisfaction in the domains affecting individual well-being is varied in quantity and length of time covered, within each domain area valuable longitudinal information is available. In addition, all of the studies have objectively measured longitudinal data available for each of the domains.

Chapter 4 Methodological and technical issues

4.1 Introduction

In this chapter we focus on methodological and technical issues associated with the measurement of well-being. Although some of these are general in nature, we relate them here to longitudinal studies. Whilst the previous chapters made the positive case for the value of longitudinal studies, the primary focus in this chapter is on the challenges of well-being measurement. We make a number of suggestions as to how these can be addressed.

We begin by discussing the major challenge of how to measure a complex, multi-dimensional construct like well-being from surveys using single self-assessment scales. This raises questions of how many dimensions are needed to represent the construct adequately and how they interact with one another. We also relate this discussion to the future development of well-being measures.

We then consider the issue of comparability across time which must be addressed to ensure that the measures of well-being continue to be robust over the long term. The issues of reliability and stability in the context of longitudinal data are also discussed. Finally, the requirement for multi-level analysis is highlighted, which we argue is crucial to developing a full understanding of the dynamics of well-being.

4.2 Key issues of multi-dimensionality, interaction and validity

The domains identified by ONS as directly affecting individual well-being include the following: Our relationships; Health; What we do; Where we live; Personal finance; and Education and skills. These cover broad topic areas which will be associated with one another as well as having sub-categories. This multi-dimensional nature of well-being presents a number of important measurement and analytical challenges.

4.2.1 Diverse approaches to the measurement of well-being

One approach to the measurement of well-being is to create single-item scales which are intended to capture different dimensions of well-being. This is the approach taken by ONS. For example, the four subjective well-being questions currently proposed by ONS tap four distinct but nevertheless overlapping dimensions of well-being. Together they form a single composite measure of well-being. However, some of these dimensions could appear in more than one scale.

Another approach involves the measurement of each individual dimension of well-being separately. In this case, each dimension is measured via its own multi-item standardised measurement scale.

4.2.2 Developing appropriate questions to assess well-being

In constructing measures of well-being, there are also the normal issues of question wording to be addressed. For example it has been well established that the wording of questions that seek to measure attitudes and behaviours can have an important influence on the response and its interpretation. Recent cross-sectional evidence from the Understanding Society Innovation Panel suggests that responses to well-

being questions may be strongly influenced by question wording as well as by the mode of data collection²⁸.

In the case of subjective well-being measurement, it is not merely a case of seeking the 'correct' or an 'unbiased' wording for questions, but rather that different ways of asking the question may tap different dimensions of well-being. Additionally, the negative as opposed to positive dimensions of well-being (e.g. satisfied versus dissatisfied, anxious versus calm) may relate differently to other variables. This highlights the need to consider the direction in which the question or scale is framed as well²⁹.

4.2.3 Refining the measures over time

As the measures of well-being are developed and refined, it is important to explore whether there are patterns in the available data that might also suggest new dimensions of well-being. Such explorations will help to indicate how survey questions might be modified, eliminated or supplemented to develop more useful measures in future.

Overall, this is an area that would benefit from extensive research and ONS is currently undertaking a programme of work in this area. It is also important to carry this out longitudinally to study the effect of changes in wording over time.

4.2.4 Implications of multi-dimensionality for sampling and analysis

Another important issue relates to how different dimensions of well-being may vary across different kinds of individuals. Such interaction effects can be important in identifying groups who may respond differently over time to social changes or policy initiatives. Studying such interactions will usually require larger samples than would otherwise be required and this must be taken into account at the study design stage.

For example, consider as an indicator one or more questions about an individual's 'level of energy' as a component of well-being. A subjective view of this will be conditioned by an individual's history and experience of what feels 'normal' to them. It may also depend upon factors such as time of day, current activity, changes in activity and what is considered 'normal' among those with whom they live, work and socialise. Studying how an individual's response changes over time, place and context is key to understanding how they interpret such questions. Responses to a question like the 'level of energy' example may also be relevant to several different dimensions of well-being such as 'quality of life' or 'emotional well-being'³⁰.

Analysis of how these different factors affect responses is important to establishing the validity of the measures used. Such a process of measurement development in a field which is relatively new is very important. We would recommend that it is seen as a separate strand of activity alongside the analysis of existing data. Since a major concern here is to measure changes in individuals over time, analysis must be carried out on a sample of the same individuals at two or more time points. Efficient measurement development assumes that such longitudinal data are collected.

²⁸ Stephen Pudney, 'An Experimental Analysis of the Impact of Survey Design on Measures and Models of Subjective Wellbeing' Institute for Social and Economic Research, University of Essex (<http://research.understandingsociety.org.uk/publications/working-paper/2010-01.pdf>)

²⁹ Mckennell A.C. (1978) Cognition and Affect in perceptions of Wellbeing, *Social Indicators Research*, 5, 389-426

³⁰ There is already some empirical support for this kind of complexity from the ONS initial investigations during 2011, where responses to individual well-being questions had varying inter-correlations, indicating a multidimensional structure.

4.3 Comparability across time and generations

It is clearly helpful to be able to measure changes in well-being across time, both for the population as a whole and for sub-groups such as men and women or those in different social or ethnic groups. To do this, it is possible to adopt either a *time-related* or a *time-conditional* approach to measuring change.

A time-conditional approach involves studying the relationship between a measure (of well-being) made at time t and the same or similar measurement at time $t-1$. For example, we may have a measure of 'life satisfaction' (based on a single question and a 10-point scale) at the start of the day and later at the end of the day. In this case, we would not need to ask exactly the same question at each time point. Indeed, it may be appropriate to ask about life satisfaction at the start of the day in terms of how 'satisfied' people felt, whereas at the end of the day it might be more appropriate to ask about satisfaction with the activities of the day. This approach more generally allows for a flexible updating of the measurement with new, typically more relevant items over time.

The time conditional approach is appropriate when the goal is to see how other variables (e.g. social background, etc.) affect the relationships. In this case, statements can be made such as: "*For a given level of well-being at time $t-1$, young adults have higher average measured well-being at time t than older adults.*"

It is often assumed that the use of exactly the same measurement at each point in time allows absolute comparisons across time so that population changes in the overall level of well-being can be ascertained. The difficulty with this approach is that keeping exactly the same measurement – i.e. the same set of items asked in the same way – may lead to the measurement becoming less relevant over time. The implication of this is that we may not be capturing the same concept over time if we continue to use exactly the same measures over a long period. In the case of well-being measurement it is likely that regular updating will be needed. An important research issue would be to explore how such updating should operate and at what time intervals.

Our view is that it would be possible to maintain the same instrument to enable 'absolute' comparisons over some period of time, but this may be unfeasible in the longer term. Thus, unlike many existing ONS time series, we suggest that there will need to be an ongoing review of measures and consideration of what they mean.

Pilot work would be helpful to explore measurement changes and the analysis, interpretation and presentation of data on 'relative' changes (i.e., conditional relationships) over time. This implies the necessity for collecting longitudinal data as purely cross-sectional data will not meet the requirement. It is worth pointing out that this issue is well understood, especially in the reporting of educational performance and a useful literature on this exists³¹.

4.3.1 Panel conditioning

Another important issue with longitudinal data is that of panel conditioning³². This is a major consideration when we seek to obtain comparable measures over time. The awareness of belonging to a panel study may

³¹ See e.g. C. Gipps and H. Goldstein (1983). *Monitoring Children*. London, Heinemann; Goldstein, H. and A. Heath, Eds. (2000), *Educational Standards*. Oxford, Oxford University Press

³² For more details and a good example using BHPS see Sturges, P. Alum, N. And Brunton-Smith, I. (2009) 'Attitudes Over Time: The Psychology of Panel Conditioning', in Lynn, P (ed) *Methodology of Longitudinal Surveys*, John Wiley & Sons, Chichester.

cause people to respond in ways that reflect that membership *per se*. In addition respondents may recall the responses they gave earlier and that may influence their current response. Both of these issues should be explored further. One way to do this would be to compare findings on well-being from a panel study with those obtained from cross-sectional data.

4.3.2 Understanding findings on age versus generation

In the important area of age comparisons, cross-sectional data cannot clearly distinguish between findings related to age and those due to growing up in a particular era. Thus, for example, the 'U-shaped' relationships found with age in a recent ONS report³³ might reflect the fact that older and younger individuals experienced different environments during the formative years from middle-aged individuals. To measure true changes with age longitudinal data are necessary so that individual trajectories can be followed.

4.4 Technical issues for longitudinal data: missing data, reliability and stability

There are a number of technical issues that need to be confronted when collecting and analysing longitudinal data. While these will generally be true whatever the topic of interest, with a concept such as well-being that involves the complex conceptual measurement issues already discussed, these merit special attention.

4.4.1 Missing data

One of the most important issues is that of *informatively missing data*, whether through sample attrition or item non-response. For example, those individuals with greater changes in well-being status may tend to respond less often and may also possess other characteristics of analytical interest. Weighting procedures are often used to correct for these types of potential biases. Another convenient way to deal with these issues is within a multiple imputation framework where 'auxiliary' variables can be used to correct for potential biases. Such auxiliary variables may be contextual, for example factors related to the neighbourhood or it may involve other types of data, such as observations made by interviewers³⁴.

4.4.2 Reliability

Another relevant issue is the *reliability* of the various measures and scales of well-being. The power of longitudinal studies depends on how consistent the measures are over time. Analyses will need to be undertaken to explore how reliable the existing well-being measures are over time.

Moreover, existing composite scales used to measure well-being rely upon internal consistency measures of reliability. These typically rest upon assumptions that are very difficult to test. This does not mean they are wrong, but suggests that more caution is needed when interpreting results. In particular it is difficult to separate assumptions about the independence of individual items comprising well-being scales from assumptions about the number of underlying 'dimensions' of the well-being constructs.

In other words, we are attempting to measure a concept with many dimensions using scales with many dimensions. In doing so, it is important to be clear that the scales are accurately measuring what we want

³³ http://www.ons.gov.uk/ons/dcp171776_244488.pdf

³⁴ See Goldstein, H. (2009). "Handling attrition and non-response in longitudinal data." *International Journal of Longitudinal and Lifecourse Studies* 1: 63-72.

them to measure. We also need to be sure that the items in the scales are not related to each other in unidentified ways which could skew the final results.

4.4.3 Stability of measures over time

The issue of stability (or variability) over time is also very important. Responses to scale measures of well-being may vary according to time of day or the day of the week as a result of other experiences encountered by individuals. It is to be expected that people will experience fluctuations in their actual and perceived well-being. However, as these fluctuations may be very short term, the question arises as to whether it is sensible to follow the details of such fluctuations or instead attempt to aggregate them over a longer period of time. Likewise we can attempt to measure a suitable sample repeatedly over short time periods, but problems also arise from frequent repetition. We recommend that ONS gives careful consideration to these issues as reasonable estimates of reliability will help to avoid biases associated with measurement errors.

4.4.4 Inter-generational measurement of well being

Cohort studies can be particularly helpful to study the inter-generational aspects of well-being. This is because they allow us to compare measures of well-being in parents and children at the same or similar ages. A suggestion for the future is to follow up cohort members' children asking them questions in the same formats as used with the cohort members themselves. This would enable clear comparisons of well-being between the generations.

If a project like this were undertaken, both the 1958 and 1970 cohorts could potentially be used. Cohort members' children were previously interviewed when the cohort members were 33 and 34 years respectively. This provides a sample of cohort offspring who are now in their twenties and thirties. The data from such a study could be compared with the US National Longitudinal Study of Youth that used the same measures and studied children of their cohort members throughout the childbirth period of the cohort members.

4.5 Levels of measurement and aggregation

ONS has indicated important distinctions between well-being at the individual level and well-being at higher levels of aggregation, such as workplaces, communities, local authorities, regions or the nation. Therefore well-being is a concept that can be defined, measured and reported at different levels. However, it is important to bear in mind that higher levels of aggregation also contain smaller units which might usefully be studied. For example, residential neighbourhoods contain smaller social groups that overlap and contribute jointly to well-being. Clarity about how such mechanisms work is important both for understanding the factors influencing well-being at the individual level and at higher levels of aggregation. In terms of designing suitable samples to explore such contextual factors it is important to ensure that enough of the higher level units are sampled.

4.6 Analysis and presentation of well-being data

In addition to mean values of income or social status that present an overall picture, we can also study the extent to which income and social status vary among the individuals grouped within the environment. In this way it becomes possible to explore 'inequalities' that are defined simultaneously at different, overlapping levels in ways that have not been fully explored in the existing literature on inequality. This is a

crucial issue, given the imperative to understand the drivers of inequality across a wide range of policy areas. One of the aims of analysis must be to ‘explain’ some of the variation between individuals in terms of well-being outcomes. Such factors might be contextual, such as the quality of the local environment or they might be individual such as income or employment status. This implies that a multi-level approach to analysis would best for understanding variance in well-being both at the individual level and at higher levels of aggregation. The application of this approach to longitudinal data would also help to explain how changes in contextual or personal factors relate to changes in well-being over time.

In order to capture this real life complexity in our data analysis, sophisticated multi-level modelling is required. It will also be important to consider how best to present the results of such sophisticated analyses. ONS are currently exploring new approaches to data visualisation to help communicate well-being results as clearly as possible.

4.7 Summary

This chapter identifies a number of technical and methodological challenges associated with the measurement of well-being. We have focused on: the need to pay ongoing attention to the changing validity of well-being measures over time; issues associated with missing data; reliability and stability in longitudinal measurement of well-being; and methods of capturing the real life complexity of well-being in our analysis and explaining it clearly to others.

Chapter 5 Overview and recommendations

5.1 Overview

This chapter presents a summary of the key longitudinal data available for the study of well-being in the UK. It also makes recommendations for how to make best use of the existing data resources and their future development.

Among the studies reviewed, a few have included the four ONS subjective well-being questions and many more contain items which are similar to the ONS questions. Data are also available from many of the studies relevant to the domains identified by ONS as directly affecting individual well-being (e.g., Our relationships, Health, What we do, Where we live, Personal finance, and Education and skills).

Among the studies reviewed, the birth cohort studies in particular have extensive data over long periods of the life course on the domains identified by ONS well-being domains. All the studies also have a wide range of variables that can be used in analyses which explore subjective well-being as an outcome.

The UK has an enormous asset in its longitudinal studies, and is well placed to take a global lead in the measurement and study of well-being. The longitudinal studies reviewed here track stability and change in the lives of individuals, and so can be used also to study stability and change in society over time. They include a wide range of variables to explain these changes and to predict their later outcomes in economic, family, community, education and health areas. Longitudinal data are uniquely valuable for the development and evaluation of policy in relation to well-being as it enables understanding of:

- the extent of stability and change in well-being over time with indications of the direction and extent of changes over time in the national picture;
- how well-being changes with age for particular population sub-groups and the prevalence of well-being, inequalities in its distribution and social mobility for these groups; and
- how policies impact on subjective and objective well-being, including how groups with different exposure to specific policies may be affected by them in different ways.

5.2 Availability of data on the four ONS subjective well-being questions

Figure 5.1 provides a summary of the data available on the ONS subjective well-being questions in the longitudinal studies reviewed here.

Overall, longitudinal data on subjective well-being is available over a long time period and many years of life. The *household panel studies*, the British Household Panel Survey (BHPS) and its successor Understanding Society (USoc), have data for inter-generational comparative analysis that are similar to the four ONS questions on subjective well-being.

The *birth cohort studies* also have data on aspects of well-being that can be used for inter-generational analysis. Data on subjective well-being similar to the four ONS questions began to be collected during the adult years of the three oldest birth cohorts of 1946 (NSHD), 1958 (NCDS), and 1970 (BCS70). This data continues to be collected in an ongoing way. The 1991-92 (ALSPAC) cohort has so far not collected much well-being data that is similar to the four ONS subjective well-being questions, but the 2000-01 cohort (the Millennium Cohort Study) has data from the cohort children as well as their parent(s). All of the birth cohort studies have rich longitudinal data on objective measures of well-being collected from the outset of the studies.

Among the other longitudinal studies reviewed, key points to note are as follows:

- the UK Biobank study collects well-being data focusing on health at its midlife outset and later life;
- the English Longitudinal Study of Ageing (ELSA) and the Whitehall2 study each began in mid-life and have well-being data from that point on;
- the Longitudinal Study of Young People in England (LSYPE) has information about young people and some aspects of their well-being;
- the Wealth and Assets Survey (WAS) included the four ONS well-being questions for the first time in July 2011(wave 3, year 2) and it is expected that they will be asked of everyone in the survey from this point on;
- the Life Opportunities Survey (LOS) will also include the ONS questions from wave 3 in October, 2012.
- three studies of the studies that are no longer continuing - the Family and Children's Study (FACS), the three age cohorts included in the 2007 Study, and the West of Scotland Teenage Health Study - have each collected data similar to or comparable with the four ONS questions; and
- The three census-linked longitudinal studies (the ONS Longitudinal Study, the Scottish Longitudinal Study and the Northern Ireland Longitudinal Survey) do not have data comparable with the four ONS subjective well-being questions, but they have extensive data on aspects of objective well-being.

Figure 5.1 Summary of sources of longitudinal data similar to or the same as the four ONS questions on well-being

ONS well-being question	Study source, life course period of longitudinal data on this question, and in brackets numbers of collections of same or similar longitudinal data	Time period covered by the longitudinal data, and in brackets sample size (responding individuals/households) at or about the first date given	One-off data collected in the specified studies at these ages and dates and responding individuals/households at the given date
Overall how satisfied are you with your life nowadays?	1946: 48-60/64yrs (2) 1958: 33-50yrs (5) 1970: 21-34yrs (4) 2000-01: 7-10yrs (2) 2007: 15-35yrs (5) 2007: 35-55yrs (5) 2007: 55-75yrs (5) BHPS: 16-80+yrs (18) USoc: 16-80+yrs (2) ELSA: 50+yrs (5) Whitehall2: 35-76yrs (8) WAS: all ages	1994-2010 (3,035) 1991-2008 (12,537) 1991-2005 (11,628) 2007-2011 (13,857) 1985-2005 (1,009) 1985-2005 (1,096) 1985-2005 (1,042) 1991-2008 (7,130) 2009-2010 (23,430) 2002-2010 (12,100) 1985-2006 (10,308) 2006-2010 (30,595)	2000-1: 7yrs: 2007 (14,402) LSYPE: 19yrs: 2010 (8,682 households) WoS Teenage Health Study: 19yrs: 2003 (1,258) Biobank: all ages over 40yrs: 2007 onwards (500,000)
Overall how happy did you feel yesterday?	1946: 13-60-64yrs (5) 1958: 33-50yrs (2) 2000-01: 4-7yrs (2) BHPS: 16-80+yrs (18) USoc: 16-80+yrs (2) ELSA: 50+yrs (5) Whitehall2: 35-76yrs (8) WAS: all ages	1959-2010 (4,127) 1991-2008 (11,407) 2004-2007 (15,246) 1991-2008 (7,130) 2009-2010 (23,430) 2002-2010 (12,100) 1985-2006 (10,308) 2006-2010 (30,595)	2000-01: 10yrs FACS: at all ages: 2008 (5,888) 1970:34yrs 2004 (9,656) Biobank all ages over 40yrs: 2007 onwards (500,000)
Overall how anxious did you feel yesterday?	1946: 13-60/64yrs (7) 1958: 23-42yrs (3) 1970: 16-34yrs (4) WAS: all ages (2) BHPS: 16-80+yrs (18) USoc: 16-80+yrs (2) ELSA: 50+yrs (5) Whitehall2: 35-76yrs (8)	1959-2010 (4,127) 1981-2000 (12,537) 1986-2004 (11,621) 2006-2010 (30,595 h'holds) 1991-2008 (7,130) 2009-2010 (23,430) 2002-2010 (12,100) 1985-2006 (10,308)	FACS: at all ages: 2008 (5,888) Biobank all ages over 40yrs 2007 onwards (500,000)
Overall to what extent do you feel things you do in your life are worthwhile?	1946: 36-52yrs (2) 1958: 33-50yrs (5) 1970: 16-34yrs (5) BHPS: 16-80+yrs (18) USoc: 16-80+yrs (2) ELSA: 50+yrs (5) Whitehall2: 35-76yrs (8) WAS (all ages)	1982-1998 (3,322) 1991-2008 (11,407)) 1986-2004 (11,621) 1991-2008 (7,130) 2009-2010 (23,430) 2002-2010 (12,100) 1985-2006 (10,308) 2006-2010 (30,595)	FACS: at all ages: 2008 (5,888)

Note: WAS has include the four subjective well-being questions since wave 3 (mid 2011) but wave 3 data collection is still ongoing at the time of publication.

5.3 Availability of data relevant to ONS domains on individual well-being

Of the eighteen studies reviewed, fifteen have some longitudinal data on satisfaction in almost all aspects of the domains identified by ONS as directly affecting individual well-being. Only the three census-linked studies have no data on satisfaction in these domains.

Data from the fifteen studies covers many years of the life course, with the birth cohort sources running from mid-adulthood to ages in the early sixties, and other studies providing data covering all periods of life. The historical period covered by the data includes the last 27 years, with birth cohort data beginning consistently in 1989 and data from the other longitudinal studies with large samples beginning in 1985-88.

Longitudinal data on satisfaction in these domains is more consistent in some areas than others. The birth cohort studies are least strong on health satisfaction, and no studies are strong on satisfaction with relationships between parents and children.

Other longitudinal studies, mostly more specialist investigations not included here, have information on specific aspects of well-being, particularly in later life. They include, for example the MRC Studies of Cognitive Function and Ageing, the Lothian 1921 Cohort, Hertfordshire 1920-39 Cohort, Boyd-Orr 1923-37 and Aberdeen 1936 Cohort studies, and the Caerphilly Prospective Study.³⁵

5.4 Technical and methodological issues in the measurement of well-being

Chapter 4 considered the major methodological issues arising in the measurement of subjective well-being and discussed how longitudinal data can throw light on them. It argued for study of the potential biasing effects of measurement error and establishing stability over time, together with the impact of panel conditioning. Likewise it looked at the changing validity of well-being measures over time, including the underlying dimensionality of the well-being construct. The unit of analysis on which well-being is measured was also discussed. Overall, these important concerns require high quality longitudinal on well-being data in order to understand them fully.

5.5 Conclusions

We conclude from our review that the existing national longitudinal data resource should be energetically capitalised on because of its value as a means to understand how well-being develops and changes in the individual, what it reflects and predicts in the lives of individuals, and how it varies in relation to changing household, socio-economic and policy contexts.

The principal vehicle for collecting longitudinal material relevant to the current well-being focus is the national household panel survey, Understanding Society, and its predecessor the British Household Panel Study. This is particularly valuable because the data are collected annually, it has a large representative sample, and because well-being and other relevant contextual and explanatory data have been collected over a period of twenty years.

This is supplemented by the wealth of well-being data available in the national birth cohort studies, more specialised studies based on age cohorts such as the English Longitudinal Study of Ageing and the Longitudinal Study of Young People in England and in the Wealth and Assets Survey which is a household

³⁵ www.halcyon.ac.uk

panel study. More well-being measurement could usefully be included in bio-social studies such as UK Biobank and the new birth cohort study.

Overall the eighteen longitudinal studies reviewed, complemented by the census-linked studies and linked administrative data relevant to well-being, are a ready and cost-effective resource for investigation of the antecedents and outcomes of well-being, as well as for validation of the subjective well-being measures. Collectively, the studies reviewed cover many years of life and a long historical period. They also have the potential to collect new data on well-being.

5.6 Recommendations

Based on the findings of the review, our overall recommendations are as follows:

1. We suggest that the ONS Technical Advisory Group (TAG) is the appropriate body to assume principal responsibility for taking forward the conclusions of this report. They could consider setting up a sub-group specifically on longitudinal data, and/or could co-opt additional expertise for this purpose. In particular the group should:
 - a. keep under review progress in the measurement of well-being and the development of new measures with specific reference to the role longitudinal studies can play in this, including linkage of administrative and health record data;
 - b. discuss with existing major longitudinal study teams the development and maintenance of well-being measurement in their studies;
 - c. liaise with the forthcoming Cohort Resources Facility, the UK Longitudinal Studies Centre at the University of Essex, and the Centre for Longitudinal Studies at the Institute of Education over support for the ONS well-being measurement strategy;
 - d. facilitate harmonisation of measurement across studies while maintaining a planned variety of approaches;
 - e. steer the development of new measures and methodological research programmes; and
 - f. promote secondary analysis of existing longitudinal data to support the ONS programme.

2. To reflect the importance and central role of the Understanding Society study (USoc) and the national birth cohort studies in supporting the measurement of well-being agenda, ONS should seek to ensure the continuation of well-being measurement in the studies as data collection in them continues.

3. ONS should seek to develop further the longitudinal resource by the addition of questions on well-being in younger people in the Longitudinal Study of Young People in England, the Millennium Cohort Study, Avon Longitudinal Study of Parents and Children and the new national birth cohort study due to begin in 2012. Similarly it would be valuable to add subjective well-being questions to the longitudinal studies concerned with later life. The English Longitudinal Study of Ageing will include the four questions from wave 6 (2012), but the new Northern Ireland Cohort for the Longitudinal Study of Ageing (NICOLA) could also include them as could the prospective Health and Ageing in Scotland study (HAGIS). It would also be helpful if the UK Biobank Study, and the 1958 and 1946 national birth cohort studies included the questions. The Wealth and Assets Survey

already includes the ONS subjective well-being questions and has potential to throw new light on well-being particularly in relation to the personal finance domain.

4. ONS, in liaison with the Research Councils, should encourage further follow-up (e.g. directly through questions to parents or indirectly through administrative data sources) of the already studied and now adult offspring of the 1946 and 1958 cohort members. This would provide a unique opportunity to study inter-generational well-being. The scope for extending such research to the children of the 1970 cohort study members, Understanding Society and other longitudinal studies should also be investigated.
5. ONS and the Research Councils should support a programme of secondary analysis of existing longitudinal data to enhance understanding of the origins and outcomes of well-being. This could comprise:
 - a. a literature review to identify existing gaps;
 - b. analysis of the relationships between the subjective and objective measures of well-being to make clear the processes through which well-being is gained or lost;
 - c. analysis of well-being at different life course stages – childhood, adolescence, adulthood, old age;
 - d. comparison across cohorts to investigate how societal changes may affect well-being; and
 - e. investigation of national differences in well-being through the use of integrated international datasets (e.g., the Survey of Health, Ageing and Retirement in Europe (SHARE) and the Cross National Equivalent File (CNEF comprising household studies in eight countries including the US and Russia)).
6. A programme of methodological investigations should be undertaken by ONS in collaboration with the UK Research Councils to include:
 - a. validation of existing measures possibly as part of the ESRC's secondary data analysis initiative to include analysis of the dimensions of well-being, identification of the relationships between the dimensions and with other variables, and assessment of changes in the validity of well-being measures over time to identify whether and how they should be refined;
 - b. analysis of short and long-term stability and reliability of well-being measures; and
 - c. measurement of inequality in well-being and factors that affect well-being at different levels of aggregation such as local communities and in institutions like workplaces.
7. ONS in liaison with the Measuring National Well-being Technical Advisory Group should examine the case for expanding the scope of well-being measurement to include social and civic activity. Analysis of existing longitudinal data to explore how well-being relates to active citizenship would be a first step.

5.7 Concluding comment

This review has shown the range and nature of longitudinal studies in the UK which provide data on well-being. The studies offer much potential for enhancing the policy value of the measures currently being piloted, and for the better understanding the validity of the measures in use, and the development of new

measures. The recommendations for research provide a rich menu of possibilities for extending the ONS programme in fruitful directions in the UK and internationally. We hope therefore that high priority will be attached to implementing them.

APPENDIX 1: Studies included in the review and template grid

MRC National Survey of Health and Development (NSHD) – the 1946 birth cohort study**

National Child Development Study(NCDS) – the 1958 birth cohort study**

Birth Cohort Study of 1970 (BCS70)**

Millennium Cohort Study (MCS)- the 2000/01 birth cohort study**

Avon Longitudinal Study of Parents and Children (ALSPAC)**

British Household Panel Survey (BHPS)/Understanding Society (USoc)*

The Wealth and Assets Survey (WAS)***

Families and Children Study (FACS)**

The English Longitudinal Study of Ageing (ELSA)*

The Life Opportunities Survey (LOS)***

The Whitehall2 Study*

UK Biobank*

Longitudinal Study of Young People in England (LSYPE)**

The West of Scotland 2007 Study (WoS 2007)**

West of Scotland Teenage Health Study (WoS 11-16)**

ONS Longitudinal Study (ONS LS) – covering England & Wales*

Scottish Longitudinal Study (SLS)*

The Northern Ireland Longitudinal Study (NILS)***

Key:

- * Responded directly without using the grid.
- ** Responded using the grid
- *** Information taken from website.

LONGVIEW WELL-BEING LONGITUDINAL SURVEY FOR ONS: MEASUREMENT GRID

Has your study collected data on in the following areas?	Yes (✓) (No (X)	Question wording and response categories or the name of scale used (or reference to the relevant documentation)	For studies of individuals give ages at which this measurement was made	For household panel studies give sweep/wave numbers and at which ages this measurement was made	Comments
A. Subjective well-being (ONS questions)					
1.How satisfied with life					
2. How happy felt yesterday					
3. How anxious felt yesterday					
4.How worthwhile the things you do in your life					

5.Looking back how satisfied are you with life and your personal happiness					
6.Other (write in)					
Has your study collected data in the following areas?	Yes (✓) No (X)	Question wording and response categories or the name of scale used (or reference to the relevant documentation)	For studies of individuals give ages at which this measurement was made	For household panel studies give sweep/wave numbers and at which ages this measurement was made	Comments
<u>B.1. Personal relationships</u>					
1.Satisfaction with current partnership relationship					
2.Satisfaction with relationship with own children					
3.Satisfaction with relationship with own parents					
3.Satisfaction with social life					

4.Trust in other people in your neighbourhood'					
5.Feeling of belonging in the neighbourhood 6.Retrospective assessment of satisfaction with family life					
7.Prospective assessment of future chances of satisfaction with family life					
8.Other (write in)					
Has your study collected data in the following areas?	Yes (✓) No (X)	Question wording and response categories or the name of scale used (or reference to the relevant documentation)	For studies of individuals give ages at which this measurement was made	For household panel studies give sweep/wave numbers and at which ages this measurement was made	Comments
<u>B 2. Health</u>					
1.State of physical health					
2.State of mental health in terms of anxiety and depression					

3.Satisfaction with physical health					
4.Satisfaction with mental well-being					
5.Retrospective satisfaction with health					
6.Assessment of future health chances					
7. Self-report of long-standing illness					
8. Self report of disability					
9.Other (write in)					
10.Anxiety and depression					

Has your study collected data in the following areas?	Yes (✓) No (X)	Question wording and response categories or the name of scale used (or reference to the relevant documentation)	For studies of individuals give ages at which this measurement was made	For household panel studies give sweep/wave numbers and at which ages this measurement was made	Comments
<u>B.3. Work and leisure time</u>					
1.Job satisfaction					
2.Satisfaction with working hours					
3.Satisfaction with amount of leisure time					
4.Volunteering (consult doc)					
5.Other (write in)					

Has your study collected data in the following areas?	Yes (✓) (No (X)	Question wording and response categories or the name of scale used (or reference to the relevant documentation)	For studies of individuals give ages at which this measurement was made	For household panel studies give sweep/wave numbers and at which ages this measurement was made	Comments
<u>B.4. Accommodation and neighbourhood</u>					
1.Satisfaction with accommodation					
2. Satisfaction with area					
3.Fear of crime in this area					
4. How well people from different backgrounds get on together					
5.Level of trust among people in the area'					
6.Other (write in)					

Has your study collected data in the following areas?	Yes (✓) (No (X)	Question wording and response categories or the name of scale used (or reference to the relevant documentation)	For studies of individuals give ages at which this measurement was made	For household panel studies give sweep/wave numbers and at which ages this measurement was made	Comments
<u>B.5. Personal finance</u>					
1. Satisfaction with personal income					
2. Satisfaction with household income					
3. Satisfaction with personal assets					
4. Other (write in)					

Has your study collected data in the following areas?	Yes (✓) No (X)	Question wording and response categories or the name of scale used (or reference to the relevant documentation)	For studies of individuals give ages at which this measurement was made	For household panel studies give sweep/wave numbers and at which ages this measurement was made	Comments
<u>B.6. Education and skills</u>					
1.Satisfaction with educational achievement					
2.Satisfaction with qualifications,					
3. Satisfaction with literacy					
4.Satisfaction with numeracy					
5.Satisfaction with ICT skills					
6.Ambitions and aspirations for acquiring new skills/qualifications					
7.Other (write in)					