Mixed Modes and Measurement Error

01 October 2007 - 28 February 2011

Quantitative Data

User Guide

A study funded by the Economic and Social Research Council (ESRC) Survey Design and Measurement Initiative and carried out by the National Centre for Social Research (NatCen) and the Institute for Social Economic Research (ISER) at the University of Essex

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1 Background

Increasing pressures of falling response rates and rising costs of survey operations have led many to explore the potential benefits of combining different modes of survey data collection, such as face-to-interviewing, telephone interviewing, postal surveys and web surveys. The drawback of using more than one mode is that the data may not be comparable if people give different answers depending on the mode of data collection. There is a need for practical advice to inform decisions about when and how to mix modes, since survey designers are making these decisions in an ad hoc manner, driven by considerations of costs and response rates, but often ignoring the potential impact on data comparability.

The aim of this study was to increase our understanding about the causes and consequences of mixing modes in order to improve survey research quality, and to provide practical advice on how to improve portability of questions across modes, in particular to answer the following questions: which mode combinations are likely to produce comparable responses? And which types of questions are more susceptible to mode effects?

This project was funded by the Economic and Social Research Council (ESRC) Survey Design and Measurement Initiative (SDMI). The 3-year contract started in October 2007 and was extended until 28 February 2011 due to an unanticipated delay in data collection. The principal investigator was Gerry Nicolaas from the Survey Methods Unit at the National Centre for Social Research (NatCen); Professor Peter Lynn and Dr Annette Jäckle from the Institute for Social Economic Research (ISER) at the University of Essex were co-applicants in the ESRC grant. The independent survey methods consultant Dr Pamela Campanelli also provided a significant contribution in this experiment.

The study was conducted in three phases:

1. literature review to develop a theoretical framework of mixed modes, identify gaps in evidence base and formulate hypotheses to address these gaps.
2. quantitative data analysis to test hypotheses using existing datasets and new experimental data.
3. cognitive interviewing to explore how respondents process questions in different modes.

This User Guide deals only with the 2nd phase, that is the quantitative study. Further information on the two other phases of the project can be found in the reports and publications listed in section 5 at the end of this document.

2 Methodology of the Quantitative Study

2.1 Study design

2.1.1 Surveys used in the follow-up study

The collection of experimental data took place in two surveys:

1. the NatCen Omnibus survey, based on a probability sample of adults aged 16 and over in Great Britain, whereby clients are able to buy questionnaire space on topical issues. The survey is administered quarterly to a fresh sample of respondents and 1,600 interviews are administered face-to-face using CAPI (Computer Assisted Personal Interview).

2. the British Household Panel Study (BHPS), which has become part of the UK Household Longitudinal Survey now known as ‘Understanding Society’. It is managed by the Institute for Social and Economic Research at Essex University and is funded by the Economic and Social Research Council. Its main objective is to further our understanding of social and economic change at the individual and household level in Britain and the UK. It is based on an original probability sample of 5,000 households in Great Britain in 1991. Individuals from these

households have continued to be followed annually ever since, and are therefore seasoned panel members. The interviews are conducted face-to-face using CAPI.

2.1.2 Collection modes and fieldwork dates

The original NatCen Omnibus and BHPS surveys included an identical block of 15 'BHPS' questions administered face-to-face via CAPI in Jul/Aug 2008 and Sep/Oct 2008 for NatCen Omnibus, and as part of wave 18 (Sep-08 to Dec-08) for BHPS.

The mixed modes questionnaire repeated this same module of 15 questions six months later, to estimate mode effects in measures of change between the original and follow-up surveys, and included an additional set of 67 questions designed to test a set of hypotheses about the causes and consequences of mode effects.

All follow-up questions were asked either:

- by telephone in a Computer Assisted Telephone Interview (CATI), or
- by self-completion on the internet in a Computer Assisted Web Interview (CAWI), or
- face-to-face in a Computer Assisted Personal Interview (CAPI) for the NatCen Omnibus follow-up only. The face-to-face interview with the BHPS respondents was conducted in the next annual wave (wave 19), so 12 months after the primary survey, and is not included here.

The field work dates for the follow-up study are detailed below:

- Omnibus:
  - CAPI: wave 1=02/02/2009 until 27/04/2009 (for respondents interviewed originally in Summer 2008) and wave 2=23/03/2009 until 18/05/2009 (for respondents interviewed originally in Autumn 2008)
  - CATI: wave 1=29/01/2009 until 11/03/2009 (for respondents interviewed originally in Summer 2008) and wave 2=27/02/2009 until 25/04/2009 (for respondents interviewed originally in Autumn 2008)
  - CAWI: waves 1 & 2 combined= 27/02/2009 until 04/06/2009
- BHPS
  - CATI: 27/05/2009 until 28/06/2009
  - CAWI: 27/05/09 until 27/07/2009 (after telephone chasing)

The survey design is presented in Appendix I.

Note: the initial design proposed used a module of 20 BHPS questions and 40 additional questions but these numbers were changed to 15 and 67 respectively for the final questionnaire that went into the field.

2.2 Hypotheses tested

Mixing modes of data collection can reduce data comparability because people may answer questions differently depending on the mode. For example, the presence of an interviewer in face-to-face and telephone interviews can result in more socially desirable responses compared to self-completion surveys. On the other hand, an interviewer can motivate a respondent to provide complete and accurate answers as well as assist them with difficult questions thus reducing survey satisficing compared to self-completion modes. Responses to questions can also be different when presented visually rather than aurally, with some evidence of primacy effects in visual modes compared to recency effects in aural modes. And finally, many standard questions in the UK have been designed to be 'optimal' for the face-to-face mode and use formats which have to be adapted considerably when used in other modes, thus increasing the risk of differences in measurement by mode.

2.1.1 Questions specifications

The full list of questions and answers is given in Appendix II

Repeated block of questions

The original 15 'BHPS' survey questions about neighbourhood, managing finances and health were repeated in the follow-up to provide a measure of change at a 6-month interval and an estimate of the effect of mode of delivery (CAPI versus CATI versus CAWI).

New questions for the mixed modes experiment

The 67 additional questions asked in the follow-up, mostly on the subjects of neighbourhood and managing finances, were classified according to:

a) the type of question: satisfaction, other attitudinal, factual, or behaviourial. Example:

Satisfaction	*Attitudinal*	*Factual*	*Behavioural*
GB17x And on the whole, how satisfied are you with the present state of the economy in Great Britain? 1 Very Satisfied 2 3 4 5 6 7 Very dissatisfied	**N53x** People who have serious mental health problems have just as much right to live in my neighbourhood as any other people. Would you say you . . . 1 Strongly agree 2 Agree 3 Neither agree nor disagree 4 Disagree 5 Or strongly disagree?	**N39x** Which of the following is closest to where you live? 1 A primary school 2 A secondary school 3 A 6th form college 4 A river 5 A lake 6 A cinema 7 Or a theatre	**FM68x** How often do you personally do grocery shopping? 1 Every day 2 3 4 5 6 7 Never

b) the inherent question difficulty (content, wording): difficult or not. Example:

Difficult (recall past expenditure, not regular outgoings like rent or mortgage)	*Not difficult*
FM69x How much did your household spend last month on grocery shopping? Would you say … 1 Less than £100 2 £100-£199 3 £200-£299 4 £300-£399 5 £400-£499 6 Or £500 or more?	**FM82x** How long have you lived in this area? 1 Less than 12 months 2 12 months or more but less than 2 years 3 2 years or more but less than 3 years 4 3 years or more but less than 5 years 5 5 years or more but less than 10 years 6 10 years or more but less than 20 years 7 Or 20 years or longer?

c) the question sensitivity: sensitive or not. Example:

Sensitive	*Not sensitive*
N52x I would worry if housing were provided near my home for people with mental health problems leaving hospital. Would you say you … 1 Strongly agree	**N35x** This neighbourhood is not a bad place to live. Would you say you . . . 1 Strongly agree

2 Agree
3 Neither agree nor disagree
4 Disagree
5 Or strongly disagree?

2 Agree
3 Neither agree nor disagree
4 Disagree
5 Or strongly disagree?

d) the type of response: ordinal, nominal, frequency, yes/no.

The 'X/Y' split ballot experiment

In addition the following question formats were compared in a 'X/Y' split ballot experiment:

i) short versus long list. Example:

FM75x
Which of these best describes your home? Would you say a . . .

1 House
2 Flat or maisonette
3 Or other ?

FM75y
Which of these best describes your home?

1 Detached house
2 Semi-detached house
3 Terraced house
4 Bungalow
5 Flat in a block of flats
6 Flat in a house
7 Maisonette
8 Or other?

ii) rating versus ranking. Example:

N45x
How important would less traffic be for improving the quality of your neighbourhood? Would you say . . .
1 Very important
2 Moderately important
3 Somewhat important
4 Or not important at all?

N46x
How important would less crime be for improving the quality of your neighbourhood? Would you say . . .
1 Very important
2 Moderately important
3 Somewhat important
4 Or not important at all?

N47x
How important would more or better shops be for improving the quality of your neighbourhood? Would you say . . .
1 Very important
2 Moderately important
3 Somewhat important
4 Or not important at all?

N48x
How important would better schools be for improving the quality of your neighbourhood?

N45y-N45y7
What would you consider most important in improving the quality of your neighbourhood? Please rank the following 7 items from 1 (meaning most important) to 7 (meaning least important).

N45y Less traffic (Rank 1..7)

N45y2 Less crime (Rank 1..7)

N45y3 More / better shops (Rank 1..7)

N45y4 Better schools (Rank 1..7)

Would you say . . .
1 Very important
2 Moderately important
3 Somewhat important
4 Or not important at all?

N49x
How important would more or better facilities for leisure activities be for improving the quality of your neighbourhood? Would you say . . .
1 Very important
2 Moderately important
3 Somewhat important
4 Or not important at all?

N50x
How important would better transport links be for improving the quality of your neighbourhood? Would you say . . .
1 Very important
2 Moderately important
3 Somewhat important
4 Or not important at all?

N51x
How important would more parking be for improving the quality of your neighbourhood? Would you say . . .
1 Very important
2 Moderately important
3 Somewhat important
4 Or not important at all?

N45y5 More / better facilities for leisure activities (Rank 1..7)

N45y6 Better transport links (Rank 1..7)

N45y7 More parking spaces (Rank 1..7)

iii) agree/disagree statements versus forced choice in balanced questions addressing more than one side of the issue. Example:

Balanced format

N54x
If housing were provided near your home for people who were leaving prison . . .

1 Would you be concerned about your family's safety

2 Or would you feel that they have just as much right to live in your neighbourhood as any other people?

Agree/Disagree

N54y
I would be concerned for my family's safety if housing were provided near my home for people who were leaving prison. Would you say you . . .
1 Strongly agree
2 Agree
3 Neither agree nor disagree
4 Disagree
5 Or strongly disagree?

N55y
People who have been in prison have just as much right to live in my neighbourhood as any other people. Would you say you . . .
1 Strongly agree
2 Agree
3 Neither agree nor disagree
4 Disagree
5 Or strongly disagree?

iv) ‘yes/no for each’ versus ‘mark all that apply’. Example:

GB21x
Would increasing pensions reduce poverty?

1 Yes
2 No

GB22x
Would investing in education for children reduce poverty?

1 Yes
2 No

GB23x
Would improving access to child care reduce poverty?

1 Yes
2 No

GB24x
Would the redistribution of wealth reduce poverty?

1 Yes
2 No

GB25x
Would increasing trade union rights reduce poverty?

1 Yes
2 No

GB26x
Would reducing discrimination reduce poverty?

1 Yes
2 No

GB27x
Would increasing income support reduce poverty?

1 Yes
2 No

GB28x
Would investing in job creation reduce poverty?

1 Yes
2 No

GB21y1- GB21y9
Next are a number of questions about different ways for reducing poverty. In your opinion, which of the following would be effective in reducing poverty? MARK ALL THAT APPLY.

GB21y1 Increasing pensions 0/1

GB21y2 Investing in education for children 0/1

GB21y3 Improving access to child care 0/1

GB21y4 Redistribution of wealth 0/1

GB21y5 Increasing trade union rights 0/1

GB21y6 Reducing discrimination 0/1

GB21y7 Increasing income support 0/1

GB21y8 Investing in job creation 0/1

GB21y9 *None of these* 0/1

v) branching versus no branching. Example:

No branching

N40x
Please indicate whether you consider your local shopping facilities to be . . .

1 Extremely poor
2 Very poor
3 Poor
4 Good
5 Very good
6 Or extremely good?

Branching

N40y
Please indicate whether you consider your local shopping facilities to be poor or good?

1 Poor GO TO N41y
2 Good GO TO N42y

N41y
Would this be poor, very poor or extremely poor?

1 Poor GO TO N43y
2 Very poor GO TO N43y
3 Extremely poor GO TO N43y

N42y
Would this be good, very good or extremely good?

1 Good
2 Very good
3 Extremely good

vi) fully-labelled versus end-labelled scales. Example:

End-labelled

GB16x
On the whole, how satisfied are you with the way democracy and personal freedom work in Great Britain, where 1 is very satisfied and 7 is very dissatisfied?

1 Very Satisfied
2
3
4
5
6
7 Very dissatisfied

Fully-labelled

GB16y
On the whole, how satisfied are you with the way democracy and personal freedom work in Great Britain?

1 Very Satisfied
2 Moderately Satisfied
3 Slightly Satisfied
4 Neither Satisfied nor Dissatisfied
5 Slightly Dissatisfied
6 Moderately Dissatisfied
7 Very Dissatisfied

The 'Z/A' sub-split ballot

A further 'Z/A' sub-split ballot under either the X or Y route tested the effect of using a showcard versus no showcard in CAPI mode when there was a long list of possible answers. For example, FM82x – given as an example in question type b) p.5 about difficulty level – was divided into FM82xa (no showcard) versus FM82xz (with showcard).

A full list of the questions specifications is given in Appendix III.

2.1.2 Hypotheses and Expectations

The main aim of the follow-up study was to compare question responses between modes. It was possible to test if respondents gave the same answers when being asked questions over the phone ('aural' mode only) or being asked in person ('aural' mode, plus 'visual' mode if showcards are used) or seeing questions on a computer screen ('visual' mode only).

Satisficing

The hypotheses tested measured in particular the degree of satisficing - which includes non-differentiation, primacy and recency effects explained below - depending on the mode and format used.

- Satisficing may occur when survey respondents are unwilling or unable to invest the effort required to provide a complete and accurate answer to a survey question (Krosnick, 1991).
  - Likelihood to satisfice is linked to respondent ability, respondent motivation and task difficulty.
  - Therefore more satisficing will be expected in self-completion mode (CAWI) than in interviewer modes (CAPI and CATI) as the interviewers motivate respondents to make the required effort.
  - If there is an acquiescence bias due to satisficing, that is a tendency to agree with any assertion, regardless of its content, more bias will be expected in self-completion than interviewer modes.
  - However if there is an acquiescence bias *due to lower cognitive ability*, then an interviewer's fast pace may exacerbate the problem. More acquiescence will be expected in telephone (and maybe face-to-face) mode than in self-completion mode where the respondent has control over pace.
  - The presence of an interviewer, in person or over the phone, reduces the privacy of reporting situation: therefore if there is an acquiescence bias *due to social desirability*, less bias will be expected in self-completion.
  - Show cards improve question comprehension in CAPI. Less satisficing will be expected with the use of showcards than for the same question/answer(s) in aural mode only.

- Non-differentiation, sometimes called “straight-lining”, is a form of satisficing behaviour. Non-differentiation may occur when a respondent is asked a series of questions with the same rating scale. Rather than going through the same cognitive process for each question, the respondent may select a point on the scale that seems reasonable for one question and use that point again and again for the other questions in the series.
  - Therefore more non-differentiation will be expected with batteries of multi-item scales questions.
  - Non-differentiation in a list of all positive items is one level of satisficing, but a more extreme level is when the respondent picks the same category across all items, when the list of answers available is a mix of positive and negative items.

- Primacy effects occur when respondents are more likely to select response options at the beginning of a list rather than at the end.

- Recency effects, in contrast, occur when respondents are more likely to select response options at the end of a list rather than at the beginning.
  - For questions with many answer categories, the following would therefore be expected:
    - more primacy effects in web surveys than in face-to-face interviews with showcard
    - more primacy effects in web surveys than recency effects in face-to-face interviews without showcard or in telephone interviews.
  - Less mode effects will be expected between visual and aural modes with 'yes/no' questions than with 'code all that apply' questions because in visual mode the primacy effect is reduced by ‘yes/no’, and in the aural mode the recency effect is also reduced by ‘yes/no’.

Mode effects as affected by question type or format

- Interviewers help respondents understand the response task. With self-completion answers using end labels are more difficult than full labels. Less difference will therefore be expected in interviewer modes.
- Larger difference between modes will be expected for difficult than for easy questions.
- Similarly, a larger difference between modes will be expected for more sensitive questions.
- More unusable cases will be expected in self-completion than face-to-face where the interviewer motivates the respondent and helps make the task easier; tasks are more likely to be misunderstood in self-completion. This can lead to poor responses, higher item non-response or higher breakoffs.
- No difference in responses will be expected if branched questions are used in two modes (face-to-face versus telephone, or self-completion on the web versus telephone).
-Because branching is a different question/task than scale questions, the 'mode effect' found between branched telephone questions and visual scale questions would be due to the item design, not the mode.
- Less mode effects between visual and aural modes will be expected with 'yes/no' questions than with 'code all that apply' questions because a series of Y/N encourages the respondent to process each item in more detail, hence more items are selected with a series of Y/N rather than 'code all that apply'.
- Because visual lists (in web self-completion for instance) encourage different forms of satisficing or different forms of cognitive processing compared to aural lists (as in telephone or face-to-face interviews without showcards), we would expect to see:
    - no differences between modes if they use the same format;
    - the same differences typically found between modes within a mode (face-to-face or self-completion), if both formats are used. (however a problem in self-completion is that sometimes only 'yes' is marked, 'no' is not).

Question formats effects:

- Fewer middle categories effects will be expected with longer scales.
- Larger differences between question formats will be expected for difficult questions than for easy questions.
- A visual stimulus helps question understanding. With the aural mode only (i.e. telephone interviews or CAPI without showcards), there may be more confusion over which way a scale goes than with the visual mode. This can be measured in particular by whether the respondents changed answers between visual and aural mode.
- Showcards improve question comprehension. Therefore a larger showcard effect will be expected for difficult than easy questions.
- The effect of the showcard in face-to-face mode with and without show cards depends on the question format. In particular we would expect:
    - less show card effect for short lists.
    - a stronger show card effect for nominal than ordinal questions.

2.3 Sample design

The study used probability samples of the general adult population. The target was to achieve around 400 respondents per group for

- the three modes 2-group comparisons in the NatCen Omnibus survey, i.e. CAPI versus CATI, CATI versus CAWI and CAPI versus CAWI, and
- the two modes comparison in BHPS (CATI versus CAWI).

As it became apparent that there would not be enough cases if the follow-up sample was limited to those who had agreed to be re-contacted *and* had also access to the internet, all NatCen Omnibus and BHPS survey respondents who had agreed to be re-contacted were randomly allocated to one of the three (NatCen Omnibus) or two (BHPS) modes in the mixed modes experiment, using systematic sampling. Only the CAWI sample was restricted to those respondents who had access to and used the internet. For the online survey, the URL address and access code for accessing the web questionnaire were sent by email if the respondents had provided an email address at the time of the main survey, otherwise this information was sent by post.

With regards to BHPS, as the original survey was conducted at household level and could include several respondents per household, an additional step was required for the follow-up study: a sample of households was first randomly selected, and then one adult per household was randomly selected from that sample so as to match the NatCen Omnibus design.

Although the CAPI and CATI samples were not restricted to respondents who had access to and used the internet, only those cases which fit these criteria were used when the analysis involved a comparison with the CAWI mode.

The split ballot experiments

- For the X/Y split ballot experiment, in each mode a random 50% sample of the respondents was allocated to the 'X' route and the remaining 50% to the 'Y' route.

- Some of the questions in CAPI had a further Z/A split ballot under the X/Y route. In that case a random 50% sample of either the 'X' route or 'Y' route respondents followed the 'Z' route and the remaining 50% the alternative 'A' route.

2.4 Response rates

The final figures for the completed fieldwork are listed in Table 1 and the response rates are detailed in Table 2.

Table 1: Mixed modes experiment sample sizes

Mode	NatCen Omnibus	BHPS
CAPI	380	-
CATI	409	532
CAWI	349	334
Total completed	*1,138*	*866*
Total issued	*1,867*	*1,661*

Table 2: Mixed modes experiment response rates

Mode	NatCen Omnibus	BHPS
CAPI	73%	-
CATI	69%	70%
CAWI	47%	37%

The early response rates for the web questionnaire were very low, putting the study at risk. Incentives in the form of vouchers were used to boost response. NatCen also contacted web survey non-respondents by phone and attempted to persuade them to complete the questionnaire online. These efforts were successful. In addition to pushing up the response rates, the telephone chasing exercise also collected some useful information for future web surveys, such as why people did not take part if they refused, why they did not give an e-mail address if they refused to and if they had any problems with the website.

3 Using the data

3.1 The datasets

The Mixed Modes study data are available in two SPSS files:

- 'MM_NatCenOm.sps' for the NatCen Omnibus follow-up study in CAPI, CATI and CAWI, and
- 'MM_BHPS.sps' for the BHPS follow-up in CATI and CAWI only.

If the two datasets are combined, the difference in design between the two surveys will have to be taken into account in the analysis: in BHPS the respondents are seasoned panel members whereas the NatCen Omnibus respondents are new at each wave. The socio-demographic variables may also be slightly different between the two datasets (see details in the full list of variable names and labels in Appendix IV).

The NatCen Omnibus file contains the block of 15 questions administered in the original NatCen Omnibus CAPI survey, in addition to the follow-up questions asked 6 months later and consisting in the same block repeated along with a set of 67 new questions. As there was no CAPI interview in the BHPS follow-up, the original block of 15 questions from BHPS wave 18 has not been included in the file.

3.2 The variables

Variable names

The first letter(s) in the variable name refer to the question topic, e.g. Health, Neighbourhood etc., and the number which follows indicates the question number in the questionnaire. In the case of the first block(s) of 15 questions, there is also a number at the end of the variable name which indicates whether the question was asked in the original survey (1) or at the follow-up (2).
For example, variable 'FM1mm1' in the NatCen Omnibus dataset relates to Financial Management and corresponds to the 1st question in the mixed modes questionnaire. It comes from the original survey, as opposed to 'FM1mm2' which was asked in the 6-month follow-up.

Variables FM1mm1 to N15mm1 in the NatCen Omnibus dataset correspond to the block of 15 questions imported from the original CAPI survey.
Variables FM1mm2 to N15mm2 in both datasets correspond to these questions repeated 6 months later. In the CAWI mode an additional question format was tested in variable FM5mm2y in the follow-up study, the original question format being replicated in FM5mm2x.

The 'x'/'y' suffix at the end of the names of the next set of variables GB16x to FM82y indicates the questionnaire route in the (main) X/Y split ballot which was applied to the 67 new questions asked in the follow-up.

When a Z/A sub-routing was applied to measure the effect of using a showcard in the CAPI mode, the version with showcard is identified by the 'xz' or 'ya' suffix in the variable name, as opposed to 'xa' and 'yz' for the version without showcard. The use of a showcard is also mentioned in the variable label.
Since the telephone interview (CATI) and online survey (CAWI) did not use showcards and there was therefore no difference between the Z/A routes, a copy of the X/Y original variables was created with their name appended with the 'xa' and 'yz' suffix, i.e. 'no showcards used in CAPI', regardless of the actual Z/A split in the data, to help comparisons between modes. However since the online survey is a purely visual mode, it could in fact be compared with the same question in CAPI with showcard. The variable names were chosen only to be consistent in the variable labelling.

Variable labels

The variable labels have been kept long on purpose in order to give information on the question specifications - and variations between modes if applicable - in addition to the actual question content,

so as to help identify which variables can be compared with each other depending on the aim of the analysis.
In the example below showing the variable labels for variables C56x1 and C56y, the Y route asked a series of Yes/No questions (variables C56y to C63y) whereas the X version used ‘code all that apply’ (variables C56x1 to C56x8):

Variable C56x1: 'Like in neighbourhood multiple choice: its community spirit (CAPI with showcard)'.
Variable C56y: 'Whether like neighbourhood because of its community spirit'

In general ‘showcard’ has been added in the variable label only if the CAPI mode made use of them. However if the use of a showcard in CAPI was the basis of a difference between questionnaire routes (X/Y or Z/A within the X or Y route), then both ‘showcard’ and ‘no showcard’ have been mentioned in the label to help identify the versions.
Although there was no CAPI in the BHPS follow-up study, the same variable labels have been used for both datasets, so some of the BHPS variable labels mention the use of showcards in the corresponding CAPI mode in NatCen Omnibus.

Datasets layout

The socio-demographic variables taken from the original surveys have been put at the start of the datasets. Next come the variables relating to the interview mode and the X/Y and Z/A routings, and last the variables corresponding to the actual questions in the order of the questionnaire, which are grouped by X/Y route for each module.
Question FM82 is out of sequence with the rest of the questionnaire as it was asked after the first block of new Neighbourhood questions in the follow-up.

Not all the variables/questions were asked in all the modes. For example questions 21 to 28 in the Y route (GB21y1-GB21y8) and questions 29 to 34 in the X route (N29x-N29x6) were not asked in the CATI mode.

A detailed lay-out showing the differences between modes and surveys is given in Appendix V.

3.3 Weighting the variables

There are no weight variables in the dataset, as these experiments were based on the random allocation of respondents to different modes and did not require the sample to be representative of a specific population.
However a key concern was the possibility of differential nonresponse bias which would confound the substantive question comparisons between modes, in particular since the response rates for CAWI were so much lower than for CAPI and CATI. After considering several adjustment options including standard weighting, propensity score weights, and modelling with an optimal set of control variables, the modelling option was chosen and the final set of control variables comprised sex, age, ethnicity, marital status and economic activity status.

An example of the SPSS logistic regression syntax used to analyse some of the NatCen Omnibus follow-up data is given below. It used the respondent’s age, sex, employment status, highest education qualification and household tenure as control variables:

```
LOGISTIC REGRESSION VARIABLES  [Variable name]
  /METHOD = ENTER IntMode  /METHOD = ENTER RspAgBnd RespSex ILO1 HEdQual Tenure2
  /CONTRAST (IntMode)=Indicator  /CONTRAST (RspAgBnd)=Indicator
  /CONTRAST (ILO1)=Indicator
  /CONTRAST (HEdQual )=Indicator  /CONTRAST (Tenure2 )=Indicator
  /CRITERIA = PIN(.05) POUT(.10) ITERATE(20) CUT(.5) .
```

3.4 Respondents' anonymity

The 'Serial' numbers used in the original surveys and kept for the follow-up study have been replaced with randomized 'ID' numbers in the archived datasets, to add a second layer of anonymisation to the data.

In addition some of the socio-demographic variables which were taken from the original surveys and could be potentially disclosive, such as the full ages or specific ethnic groups for instance, have been grouped into broader categories for archiving.

3.5 Missing value conventions

-1 Not Applicable: used to signify that a particular variable did not apply to a given respondent, usually because of internal routing
-8 Don't Know, Can't say
-9 Refusal

3.6 Issues to be aware of when using the data

Although the variables without the X/Y suffix should have been asked all within a mode, and all variables with a name ending with x or y should have been asked all within each route X or Y respectively, there were a few cases missing for the variables listed below:

- In the series GB21x to GB28x in the NatCen Omnibus CAPI/CATI/CAWI and BHPS CATI, only the 1st variable GB21x has been asked all in the X route. GB22x to GB28x have been asked only if GB21x was answered Yes/No, so any NK or REF in this 1st variable has been treated as an additional 'Not applicable' in the rest of the variables.

- The series N29x to N29x6 should have been asked all in the X route in the NatCen Omnibus CAPI and in the NatCen Omnibus/BHPS CAWI (not asked in CATI) but a few cases were missed and show as additional 'Not applicable'.

- The series N45y to N45y7 should have been asked all in the Y route in the NatCen Omnibus CAPI and in the NatCen Omnibus/BHPS CAWI (not asked in CATI) but there are a few additional 'Not applicable' across the set.

- In the BHPS CAWI, there were also a few missing answers in the following series:
    - H9amm2-H9pmm2, which should have been asked all in CAWI
    - GB21y1 to GB21y9, which should have been asked all in the Y route
    - C56x1 to C56x8, which should have been asked all in the X route.

4 References

Krosnick, J. (1991). "Response strategies for coping with the cognitive demands of attitude measures in surveys." *Applied Cognitive Psychology*. Vol 5, 213-36.

5 Related publications

Nicolaas, G., Campanelli, P., Hope, S., Jäckle, A. and Lynn, P (2011). "Is it a good idea to optimise question format for mode of data collection? Results from a mixed modes experiment." *ISER Working Paper Series*, No. 2011-31, http://hdl.handle.net/10419/65965

Campanelli, P., Nicolaas, G., Jäckle, A., Lynn, P., Hope, S., Blake, M., and Gray, M. (2011). “A Classification of Question Characteristics Relevant to Measurement Error and Consequently Important for Mixed Mode Questionnaire Design”. Paper presented 11 October 2011 at the Royal Statistical Society, London, UK. Last accessed on 29 May 2014 at http://www.natcenweb.co.uk/genpopweb/resources.htm

Lynn, P., Hope, S., Jäckle, A. Campanelli, P., and Nicolaas, G. (2012). “Effects of visual and aural communication of categorical response options on answers to survey questions.” *ISER Working Paper Series*, No. 2012-21.

Gray, M., Blake, M. and Campanelli, P. (forthcoming 2014). The Use of Cognitive Interviewing Methods to Evaluate Mode Effects in Survey Questions, Field Methods, 26(2).

Links to reports and presentations regarding this Mixed Modes study are available on the ESRC website: http://www.esrc.ac.uk/my-esrc/grants/RES-175-25-0007/read

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