Completing social surveys on smartphones: What should we be worried about?

Tim Hanson, Peter Matthews, Alice McGee

NatCen-ESS ERIC-City methodology seminar series
24 May 2018
Agenda

- Background: importance of designing for online and mobile
- Analysis of device impact on data quality
- ‘Mobile First’ design and optimisation
- Adapting problematic question formats for smartphone: Grids
- Conclusions and next steps
Movement of surveys online

- Until fairly recently most social studies still interviewer administered; increasingly moving online

- Understanding Society, Longitudinal Study of Young People in England, Community Life and others solely or partly online

- Development work to assess feasibility of moving other surveys online (Crime Survey, Labour Force Survey)

- NatCen probability-based panel established

- Target of 75% online completions for 2021 UK census

- A number of factors behind move – cost savings, high internet penetration, falling response rates, drop in rates of landlines
Growth in ownership of mobile devices

Data from Ofcom’s Communications Market Report, 2017
Growth in importance of smartphones

Most important device for internet access

- **Smartphone**
  - 2013: 15%
  - 2014: 23%
  - 2015: 33%
  - 2016: 36%
  - 2017: 42%

- **Laptop**
  - 2013: 33%
  - 2014: 40%
  - 2015: 46%
  - 2016: 30%
  - 2017: 29%

- **Tablet**
  - 2013: 8%
  - 2014: 15%
  - 2015: 19%
  - 2016: 20%
  - 2017: 16%

- **Desktop**
  - 2013: 20%
  - 2014: 14%
  - 2015: 12%
  - 2016: 14%
  - 2017: 11%

Data from Ofcom’s Communications Market Report, 2017
Smartphones most important internet enabled device for all age groups apart from 55+

Most important device for internet access

<table>
<thead>
<tr>
<th>Device</th>
<th>Total</th>
<th>Male</th>
<th>Female</th>
<th>16-24</th>
<th>25-34</th>
<th>35-54</th>
<th>55+</th>
<th>AB</th>
<th>C1</th>
<th>C2</th>
<th>DE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smartphone</td>
<td>42%</td>
<td>37%</td>
<td>47%</td>
<td>66%</td>
<td>62%</td>
<td>44%</td>
<td>31%</td>
<td>33%</td>
<td>42%</td>
<td>47%</td>
<td>49%</td>
</tr>
<tr>
<td>Laptop</td>
<td>11%</td>
<td>15%</td>
<td>19%</td>
<td>21%</td>
<td>20%</td>
<td>29%</td>
<td>27%</td>
<td>16%</td>
<td>17%</td>
<td>14%</td>
<td>16%</td>
</tr>
<tr>
<td>Tablet</td>
<td>5%</td>
<td>5%</td>
<td>4%</td>
<td>4%</td>
<td>8%</td>
<td>8%</td>
<td>8%</td>
<td>8%</td>
<td>8%</td>
<td>8%</td>
<td>8%</td>
</tr>
<tr>
<td>Desktop</td>
<td>16%</td>
<td>13%</td>
<td>23%</td>
<td>23%</td>
<td>20%</td>
<td>15%</td>
<td>22%</td>
<td>14%</td>
<td>11%</td>
<td>14%</td>
<td>16%</td>
</tr>
<tr>
<td>Other</td>
<td>16%</td>
<td>16%</td>
<td>26%</td>
<td>19%</td>
<td>21%</td>
<td>21%</td>
<td>20%</td>
<td>16%</td>
<td>17%</td>
<td>17%</td>
<td>14%</td>
</tr>
</tbody>
</table>

Data from Ofcom’s Communications Market Report, 2017
What are our options?*

- Do nothing
- Detect and exclude
- Encourage use of alternative devices
- Allow and adapt

* Acknowledgement: Mick Couper
“Resistance is futile – ignoring the issue is not an option” Mick Couper

“If you’re doing a Web survey, you’re doing a mobile survey” Michael Link
What are we doing?

- Now allow smartphones for almost all online surveys
- Survey software supports mobile optimisation
- ‘Mobile first’ approach to designing new surveys; gradual adaptation of existing surveys
- Usability testing increasingly common
- Ongoing experimental work and analysis of survey data
<table>
<thead>
<tr>
<th>Survey</th>
<th>Year</th>
<th>% using smartphone*</th>
<th>Base</th>
<th>Contact method</th>
<th>Approx length</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community Life</td>
<td>2017-18</td>
<td>13%</td>
<td>8,170</td>
<td>Letter</td>
<td>30 mins</td>
<td>Cross-sectional, address based sampling</td>
</tr>
<tr>
<td>Understanding Society Innovation Panel W10</td>
<td>2017</td>
<td>18%</td>
<td>1,069</td>
<td>Email/letter</td>
<td>45 mins</td>
<td>Longitudinal</td>
</tr>
<tr>
<td>Active Lives Survey</td>
<td>2016-17</td>
<td>19%</td>
<td>159,316</td>
<td>Letter</td>
<td>15 mins</td>
<td>Cross sectional, address based sampling</td>
</tr>
<tr>
<td>Understanding Society W10, Q1</td>
<td>2018</td>
<td>23%</td>
<td>1,211</td>
<td>Email/letter</td>
<td>45 mins</td>
<td>Longitudinal, Interim data</td>
</tr>
<tr>
<td>Wellcome Trust Science Education Tracker</td>
<td>2016</td>
<td>25%</td>
<td>4,081</td>
<td>Letter</td>
<td>25 mins</td>
<td>Cross-sectional, 14-18 year olds Named sample</td>
</tr>
<tr>
<td>Longitudinal Study of Young People in England 2 (W4)</td>
<td>2016</td>
<td>27%</td>
<td>2,851</td>
<td>Email/letter</td>
<td>25 mins</td>
<td>Longitudinal, Interim data; 16-17 year olds</td>
</tr>
<tr>
<td>NatCen probability - based panel</td>
<td>2017-18</td>
<td>c. 30%</td>
<td>c. 1,800 per wave</td>
<td>Email</td>
<td>c. 15 mins</td>
<td>Online panel, recruited by probability methods</td>
</tr>
<tr>
<td>Taking Part Web Panel</td>
<td>2016-17</td>
<td>30%</td>
<td>1,156</td>
<td>Email</td>
<td>8-13 mins</td>
<td>Online panel; recruited face-to-face</td>
</tr>
</tbody>
</table>

* as % of all online completions
Steady increase in smartphone completions on Understanding Society; now one in four of all completing online

% completing by smartphone

Similar increase on Community Life; clear impact of removing recommendation not to use smartphones

% completing by smartphone

Advice in letter not to complete by smartphone removed

Bases: 2016-17 Q2: 2,604; 2016-17 Q3: 2,463; 2016-17 Q4: 4,290; 2017-18 Q2: 2,497; 2017-18 Q3: 2,643; 2017-18 Q4: 3,030
Particularly high levels completing by smartphone in three youngest age groups

From Understanding Society, Wave 10, Quarter 1 (2018)

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Smartphone</th>
<th>Tablet</th>
<th>Laptop/PC</th>
</tr>
</thead>
<tbody>
<tr>
<td>16-24</td>
<td>56%</td>
<td>10%</td>
<td>34%</td>
</tr>
<tr>
<td>25-34</td>
<td>47%</td>
<td>10%</td>
<td>42%</td>
</tr>
<tr>
<td>35-44</td>
<td>44%</td>
<td>19%</td>
<td>37%</td>
</tr>
<tr>
<td>45-54</td>
<td>53%</td>
<td>26%</td>
<td>22%</td>
</tr>
<tr>
<td>55-64</td>
<td>60%</td>
<td>27%</td>
<td>13%</td>
</tr>
<tr>
<td>65+</td>
<td>63%</td>
<td>31%</td>
<td>6%</td>
</tr>
</tbody>
</table>

Summary of measurement error on smartphone – mostly good news!

- Evidence across numerous studies, including by Mick Couper and Roger Tourangeau, shows that, with a few exceptions, there is:
  
  little evidence of lower data quality when surveys are completed via smartphone

- Higher breakoff rates for smartphones
- Slightly longer completion times for smartphones (but reduced when optimised)
- Mixed results for open questions
- Some issues with certain question formats: grids, drop boxes, sliders
- Vertical scrolling not problematic
- No consistent differences for other data quality indicators

Tourangeau (2017): “Collecting data on smartphones (or tablets) does not make known measurement problems any worse”*

Current areas of investigation

What evidence is there from UK social surveys about the impact of device choice on data quality?

What should we do about those question formats that are problematic for those completing on smartphones?
Analysis of device impact on data quality
Why might there be a device effect?

- Screen size
- Interface
- User context
## Two case studies

### Community Life (2016/2017)
- Department for Digital, Media, Culture and Sport
- Cross-sectional, covering topics such as volunteering, community engagement and wellbeing
- Adults aged 16+
- Data collected online / paper
- **7,381 online respondents**

### Longitudinal study of young people in England (LSYPE2)
- Department for Education
- Longitudinal study of young people, starting at age 13/14
- For first three waves, data collected in-person
- From wave four, mixture of face-to-face, telephone and online
- **2,945 online respondents**
Device choice on Community Life and LSYPE2

Community Life (2016/2017)

- 70 respondents used a smartphone
- 24 respondents used a tablet
- 7 respondents used a PC/laptop

Longitudinal study of young people in England (LSYPE2)

- 60 respondents used a smartphone
- 12 respondents used a tablet
- 27 respondents used a PC/laptop

505 respondents used a smartphone
827 respondents used a smartphone
Which respondents are more likely to use a smartphone?

<table>
<thead>
<tr>
<th>Community Life (2016/2017)</th>
<th>Longitudinal study of young people in England (LSYPE2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Female</td>
<td>• Female</td>
</tr>
<tr>
<td>• Not have a degree</td>
<td>• Achieved fewer GCSEs</td>
</tr>
<tr>
<td>• Renting</td>
<td>• Parents do not own home</td>
</tr>
<tr>
<td>• Younger</td>
<td>• Has a part-time job</td>
</tr>
<tr>
<td>• Living in more deprived areas</td>
<td>• Lives in household with below median income</td>
</tr>
</tbody>
</table>
Device choice on Community Life: Respondents from the most deprived areas more likely to use a smartphone

Community Life (2016/2017)
Indices of Multiple Deprivation (deciles)

PC/laptop
Tablet
Smartphone
Device choice: Respondents from below median households more likely to use a smartphone

Community Life (2016/2017)

Longitudinal study of young people in England (LSYPE2)

- Below median HH income: 9% online respondents completing by smartphone
- Above median HH income: 5% online respondents completing by smartphone

- Below median HH income: 34% online respondents completing by smartphone
- Above median HH income: 25% online respondents completing by smartphone

% online respondents completing by smartphone
### Data quality indicators

<table>
<thead>
<tr>
<th>Missing data</th>
<th>Response options</th>
<th>Survey length</th>
</tr>
</thead>
<tbody>
<tr>
<td>Break-off rates</td>
<td>Straight-lining</td>
<td>Completion time</td>
</tr>
<tr>
<td>Item non-response</td>
<td>Primacy effects</td>
<td>Social desirability bias</td>
</tr>
<tr>
<td>Consent to re-contact / data linkage</td>
<td>Agreement rates (Likert scales)</td>
<td>Risky behaviours (LSYPE2 only)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Data accuracy</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Validation against administrative data (LSYPE2 only)</td>
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</tbody>
</table>

- **Data accuracy**
- **Social desirability bias** (LSYPE2 only)
- **Risky behaviours** (LSYPE2 only)
Drop-out rates: Respondents using a smartphone were less likely to finish the surveys

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>PC/laptop</td>
<td>7%</td>
<td>1%</td>
</tr>
<tr>
<td>Tablet</td>
<td>7%</td>
<td>2%</td>
</tr>
<tr>
<td>Smartphone</td>
<td>13%</td>
<td>4%</td>
</tr>
</tbody>
</table>
Community Life: Where do respondents drop out?

Community Life (2016/2017)
All devices

- 38% of drop outs in intro section
- First grid
- Income
- Fraud check

KANTAR PUBLIC=
# Data quality indicators

<table>
<thead>
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</tr>
<tr>
<td></td>
<td></td>
<td>Validation against administrative data (LSYPE2 only)</td>
</tr>
</tbody>
</table>
Survey length: Smartphone respondents did not take longer to complete the Community Life survey.
Risky behaviours: Difference in self-reported risky behaviours not a device effect

Longitudinal study of young people in England (LSYPE2)

- Smartphone respondents were more likely to say they had done these
- However, the same respondents were also more likely to say they had done these at earlier waves, when all data was collected face-to-face

<table>
<thead>
<tr>
<th>Risky Behaviours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoking</td>
</tr>
<tr>
<td>Drinking alcohol</td>
</tr>
<tr>
<td>Using cannabis</td>
</tr>
</tbody>
</table>
Data validation: Accuracy of self-reported educational attainment similar across devices

Longitudinal study of young people in England (LSYPE2)

- Respondents asked how many GCSEs they had achieved at grades A*-C
- From linked administrative data, we could identify the respondents who achieved at least 5 GCSEs at A*-C
Where are there data quality concerns?

- How can we minimise drop-out rates?
- How can we get more information at open-ended questions?
- What explains differences in survey length, and does this matter?
‘Mobile First’ design and optimisation
Optimisation for mobile/smartphone

Often hear of survey software being ‘mobile optimised’ or ‘mobile first’

‘Mobile First’: designing first and foremost for smaller screens

“But what about the questions we already have? How do we continue to ask those?”

Different levels of optimisation:

1. Resizing questions to fit smaller screens
2. Reduce questionnaire length or suit a range of devices / context of use
3. Adapting question formats to better suit smaller screens
‘Mobile First’ template

Have you used the Internet, at home or elsewhere, in the last 12 months?

Yes
No

Which of the following types of domestic fuel do you have in your accommodation? Please select all that apply.

- Electricity
- Gas, including Calor Gas
- Oil
- Other fuel, including solid fuel
- Or none of these
- Don’t know
- Don’t want to answer
Adapting problematic question formats for smartphone: Grids
Traditional grids

Different things can be important when deciding what type of occupation you want to follow. Please can you tell us how important each of the following aspects are for you. When thinking about an occupation, how important is....

<table>
<thead>
<tr>
<th>Future job security?</th>
<th>Very important</th>
<th>Important</th>
<th>Not important</th>
<th>Not at all important</th>
</tr>
</thead>
<tbody>
<tr>
<td>Having a job with a high income?</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Finding an occupation that leaves you with a lot of time for leisure?</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Finding an occupation which interests you?</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Finding an occupation which makes a contribution to society?</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Finding an occupation which leaves you with enough time for family life?</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Finding an occupation in which you can help others?</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>
Kantar Public experiments on grids

Two experiments conducted to compare traditional grids with alternative formats

1. Online access panel: compared traditional grids with three alternatives:
   a. item-by-item paging
   b. item-by-item scrolling
   c. and dynamic grids

2. Understanding Society Innovation Panel (IP10): compared traditional grids with dynamic grids
### Traditional grid

**How often do you...**

*Please pick one option only for statement*

<table>
<thead>
<tr>
<th>Activity</th>
<th>Never</th>
<th>Once or twice a year</th>
<th>More frequently than that</th>
<th>Don’t know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Go to the cinema, theatre, concerts or other performances</td>
<td>☐</td>
<td>☐</td>
<td>☑</td>
<td>☐</td>
</tr>
<tr>
<td>Go to exhibitions, libraries or other cultural or historical sites</td>
<td>☐</td>
<td>☐</td>
<td>☑</td>
<td>☐</td>
</tr>
<tr>
<td>Attend a live sporting event</td>
<td>☐</td>
<td>☐</td>
<td>☑</td>
<td>☐</td>
</tr>
<tr>
<td>Eat or drink out at a restaurant</td>
<td>☐</td>
<td>☐</td>
<td>☑</td>
<td>☐</td>
</tr>
</tbody>
</table>

### Dynamic grid

**How often do you...**

*Please pick one option only for statement*

- Go to the cinema, theatre, concerts or other performances
  - Never
  - Once or twice a year
  - More frequently than that
  - Don’t know

- Attend a live sporting event
  - Never
  - Once or twice a year
  - More frequently than that
  - Don’t know

- Eat or drink out at a restaurant
  - Never
  - Once or twice a year
  - More frequently than that
  - Don’t know
How often do you...
Please pick one option only for statement

- Go to the cinema, theatre, concerts or other performances

- Never

- Once or twice a year

- More frequently than that

- Don’t know
Experiment results

Broadly similar substantive responses across grid formats in both experiments

Three small differences relating to data quality on traditional grids:

1. Higher proportion selected first response option
2. Don’t know and Refused rates higher
3. Flatlining slightly higher

Results further support the argument for alternatives to traditional grids

Dynamic grids, ‘newest’ format, was the best alternative design
**Dynamic grids**

Different things can be important when deciding what type of occupation you want to follow. Please can you tell us how important each of the following aspects are for you. When thinking about an occupation, how important is....

<table>
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<td>Important</td>
</tr>
<tr>
<td>Not important</td>
</tr>
<tr>
<td>Not at all important</td>
</tr>
<tr>
<td>Don't know</td>
</tr>
<tr>
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<tr>
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</tr>
</tbody>
</table>
Issues with dynamic grids

- Lack of context
- Difficulty amending answers
- Navigation error
Matrix grids

During the past 4 weeks, how much of the time have you had any of the following problems with your work or other regular daily activities as a result of your physical health?

<table>
<thead>
<tr>
<th>Accomplished less than you would like</th>
<th>Were limited in the kind of work or other activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>All of the time</td>
<td></td>
</tr>
<tr>
<td>Most of the time</td>
<td></td>
</tr>
<tr>
<td>Some of the time</td>
<td></td>
</tr>
<tr>
<td>A little of the time</td>
<td></td>
</tr>
<tr>
<td>None of the time</td>
<td></td>
</tr>
</tbody>
</table>
Matrix grids: partially completed

During the past 4 weeks, how much of the time have you had any of the following problems with your work or other regular daily activities as a result of your physical health?

| Accomplished less than you would like | 1/2 |
|                                      |     |
| Were limited in the kind of work or other activities | 2/2 |

<table>
<thead>
<tr>
<th>All of the time</th>
<th>Most of the time</th>
<th>Some of the time</th>
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</tr>
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</table>

Accomplished less than you would like

Were limited in the kind of work or other activities

<table>
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<tr>
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<th>Most of the time</th>
<th>Some of the time</th>
<th>A little of the time</th>
<th>None of the time</th>
</tr>
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</table>

Grids – Summary and recommendations

- We need to explore alternatives to traditional grids for smaller screen devices
- Of the alternatives initially investigated dynamic grids were the ‘best’ design

- Dynamic grids easier to view on a smaller screen but three main issues:
  a. Lack of context
  b. Difficulty amending answers
  c. Navigation error (‘one click’ design)

- Matrix grids alleviated these issues and were consistently effective across device

**Recommendations:**
- Based on usability testing, matrix grids are a successful alternative to traditional grids
- Carry out more experimental large scale research into matrix grid design
Conclusions and next steps
Completing social surveys on smartphones: what should we be worried about? And where do we go next?

- Work to date is encouraging - little evidence of lower data quality on smartphones; initial UK analysis supports international evidence.
- But still areas for further work:
  - Avoid complexity in question design; ‘less is more’
  - Explore alternative formats for problematic question types
  - Keep testing for usability and capture the user experience
  - Analyse data quality across other UK surveys
  - How can we explore reasons for break-off on smartphone and discourage this?
  - Does including smartphones increase participation of under-represented groups?
Thank you!

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