**Mobile first? Balancing the opportunities and challenges of respondent device diversity for national statistical surveys – Emma Farrell, Australian Bureau of Statistics**

This paper is the opinion of the author and does not necessarily represent the views of the ABS.

**Great expectations**

Mobile phone saturation in Australia is very high, with 89.9% of those 14 years old or more owning one (Roy Morgan, 2019). The potential for accessing target populations for social surveys is then also high, and the lure of cheaper and faster data collection and follow-up is very appealing for a statistical organisation. Hard-to-reach people like younger adults are more likely than other age groups to access the Internet only through their phone (ACMA, 2019), and even in the homeless population of Australia, 95% reported owning a mobile phone in 2014 and 77% had smartphones (Humphrey, 2015).

The Australian Public Service is required by law to allow the country’s population to interact with it electronically, and the general approach to designing the relevant services is governed by the Digital Service Standard. Part of this Standard explains that the “service should follow mobile-first design principles” (DTA, 2020). As a government organisation, the Australian Bureau of Statistics (ABS) is expected to follow this standard, and the assumption was that large proportions of our household survey respondents would indeed want to complete our surveys using their phones. So we have endeavoured to design our questionnaires and respondent engagement materials accordingly.

However, respondent preferences have been mixed as being a mobile phone owner doesn’t equal wanting to do surveys on one. Willingness to participate in mobile phone data collection depends on both the type of data requested and the characteristics of the population (Wenz, Jackle, Couper 2019), and people can be significantly *less* willing to do mobile surveys for a statistical agency compared to university or market research studies (Keusch et al 2019).

For ABS household surveys, providing an online alternative to traditional data collection methods has been a strategic imperative for a long time. Increasing our coverage of young males was one expected benefit. However, who actually completes our web forms, especially compared to personal interviews, has been quite different to what we expected.

For one household survey where any member of the chosen household self-selects to proxy respond for the other members, the proportion of online response within each proxy age group was examined over time for approximately 200,000 survey completions. Online response in the youngest age group (15 to 30 year olds) was the lowest at 9%, compared to around 21% for the 50 to 70 year olds. A similar age pattern has been shown in our other household surveys since then. And while overall more females are willing to be the proxy respondent than males, the proportion of proxies willing to go online was roughly the same. Of all household types, single parents with children and people living in group households were the least likely to respond online.

Based on this evidence, perhaps the traditionally most compliant survey population groups are also most likely to comply with our request that they go online. This may be regardless of their personal preferences in normal life. It has been suggested that ensuring our web forms are more mobile-friendly will shift this pattern and improve overall response.

Cognitive and usability testing conducted and commissioned by the ABS over the last couple of years has identified some reasons for the reluctance felt by our respondents. In the context of the specific questionnaires being tested, they report a strong preference for laptop/desktop devices over mobile phones or tablets. Their stated reasons include the better visibility offered by the larger screen, better ease of use with a real keyboard, and preferences based on the survey length and level of detail required.

Even for surveys where respondents needed to report multiple times a day, using their phone didn’t always appeal to them based on ABS exploratory research. Being able to switch between different personal devices, and to use a desktop while at home or work because these were ‘always open’, was preferred. In some cases, the youngest test participants (15-17 years) actually reported a preference for paper forms over mobile web forms for better visibility of the entire task. Using paper or their own various apps to take notes during the day, and then a desktop computer to enter the data in one go, was also preferred by some compared to using an actual survey form on their phone.

Nevertheless, there is definitely demand for mobile phone reporting options across the broader Australian population. A field test conducted by the ABS in 2019 included the following message prominently on the web questionnaire’s login page due to the stage of development the design had achieved at that point: "We recommend using a desktop, laptop or tablet device and not a mobile phone".

Despite this, the breakdown for those who completed the web form was as follows:

**Device type breakdown**

|  |  |  |
| --- | --- | --- |
| **Device Type** | **No.** | **%** |
| Desktop/Laptop | 7,978 | 72.0 |
| Mobile | 1,630 | 14.7 |
| iPad | 1,205 | 10.9 |
| Other | 273 | 2.4 |
| **Total** | **11,086** | **100.0** |

Clearly, some allowances need to be made for the respondents who do strongly prefer to complete statistical surveys on their mobile phones. Analysis of management information from our 2016 Census indicates that the larger the household, the more likely they will complete web forms on a mobile phone. Failing to provide this option therefore risks both response bias and nonresponse bias. This, however, has questionnaire design implications for the entire survey sample.

**Responsive design**

The need to produce statistics representing the whole population requires that we provide multiple ways to respond to most surveys. The need to do so efficiently means that in practice, these are delivered using the same base questionnaire wherever possible. Having one questionnaire which is optimised for phones and one optimised for desktops (sometimes in addition to interview and/or paper) is impractical when development times are tight and coherence of data across modes is important.

The 2016 Population Census was the first major effort by the ABS to go ‘mobile-friendly’ and implement proper responsive web design so that the form content readjusted automatically based on screen size. The existing content (e.g. length of response lists and notes) was not changed to further optimise for phones as the scrolling design applied well in both modes. Only a few design areas needed particular attention, including:

* Ensuring the ranges for the income question wrapped properly so each set of figures stayed together.
* Creating more space between radio-button list and check box list response options so these were easier to select on touch-screens.
* Removing the check boxes for a response of ‘none’ in several numeric questions. These had been placed after the main response field in the corresponding paper form (e.g. for the ‘hours worked last week’ question) to improve processing efficiency and reduce respondent burden. In the web form on small screens they were below the visible window. Respondents typed ‘0’ into the numeric fields instead of scrolling past it, and then became confused or frustrated when the box appeared.

The web questionnaire itself performed very well. Analysis of the 270,000 comments provided by respondents showed very positive feedback on overall usability, including across devices. Eleven percent of households completed the form by mobile phone, and only 1.5% of responding households used more than one device indicating very low ‘switching away’ from particular versions of the design.

With other web collections since, the priority of ‘mobile-friendly’ and ‘mobile-first’ has been a genuine advantage in some ways. A national statistical household survey is often particularly long and complex, and the data requires a higher level of precision than other surveys especially when estimating changes over time for the whole Australian population. Design features that may otherwise be the standard or the latest trend, in our case including progress indicators and slider bars, are poor design for such surveys. “Our survey is different” can be a challenging argument to have with your web form software developers and others within the organisation. However, “that won’t fit on a mobile phone screen” is much more straightforward.

In some surveys, unfortunately, questionnaire design features we definitely do want also don’t fit. Grids and their alternatives have produced mixed results in experiments comparing phones and desktops (see e.g. Mavletova et al 2017). The surveys the ABS conducts contain some complex matrix questions, requiring text responses or mixed response formats. A common question is the household roll, where basic demographics are collected about everyone who lives in that dwelling. While it is possible to display this item by item, the perceived (if not actual) burden created can be enormous in an already long survey. In addition, being able to easily complete the items out of order depending on what the respondent knows and who else is present at the time can be highly desirable.

Displays of these sorts of questions are improving all the time, and the cases where we provide a warning about not completing the questionnaire on a mobile are reducing. When that is all we can do to consider respondent preferences, providing the warning on the approach letter (rather than just in the form) so respondents *start* with the right device is important.

Some form designs create problems with phone data collection which are less immediately obvious. For one recent ABS survey, responsive design and very large checkboxes were used to maximise the usability of the web form on mobile phones. Testing then identified that for some types of phones this caused the “No” response box to overlap and appear on top of the “Yes” box in the portrait display. For any other survey organisation this might be shrugged off by the respondent, and easily fixed by switching to landscape. However, for a national government organisation on what was a highly sensitive topic, it could have been perceived as encouraging a particular response.

Another problem which has emerged recently was only revealed by live respondent feedback. As part of our standard web form design, commas are automatically inserted into numerical responses of more than three digits. This improves usability and accuracy for respondents, and had been used successfully in our business web surveys for well over a decade. Our business survey respondents in general don’t use phones for reporting, and our household surveys up until recently didn’t collect numerical data with many large values. Applying the comma standard to new household web forms led to an interaction with the way particular phone browsers implemented the numeric-only field restrictions. Respondents were unable to complete the fields accurately and some could not continue at all. So how do we test effectively for these kinds of problems?

**Needles in haystacks**

If you multiply the many different devices, browsers, operating systems and screen resolutions currently in use, “the number of possible combinations racks up to- pretty discouraging” (browserstack.com, October 2019). The versions are also changing all the time. When your customers are the whole population, and the benefit to them of using your product is very indirect, identifying the worst pain points becomes critical. But the scale of our traditional cognitive and usability testing is too small to find these.

Most of the ABS household surveys include a large field test or dress rehearsal prior to final enumeration. Often though these tests are too late in the development period to address this sort of design problem. In addition, the level of privacy and security our survey forms require makes early exposure of our forms from outside our IT network environment can be very challenging. And our corporate budgets don’t stretch to having banks of myriad devices to test on, although some device simulation is possible.

One practical option is testing with the statistical organisation’s own staff. The ABS has over three thousand employees, and 90% of them are willing to ‘go the extra mile’ at work if required (staff survey June 2020). Calling for staff volunteers (from outside the specific project) to test survey forms on their own devices can be very quick, low cost and enormously valuable. One of our largest and extremely useful tests of this kind (covering both phone and tablet user testing) achieved 49 participants with mobile devices of their own, and the following phone types (note this was in 2015):

8 x iPhone 4/5/6

7 x Samsung Galaxy S2/S3/S4/S5

4 x Google Nexus 4/5

1 x Sony Xperia Z3 Compact

1 x Motorola Moto-G

2 x HTC One M7/M8

3 x LG Nexus 4/5

1 x Sony Xperia Z2

1 x LG G3

1 x HTC Sensation Z710a

1 x Nokia 820 Windows

More recently we have begun exploring using commercially available online panels for survey testing purposes. Our early investigations (testing survey content) have demonstrated that this method allows access to hundreds of diverse Australian respondents very quickly, and approximately a third of those are already using a mobile phone when they respond. We can also specifically target mobile users. Turning this to our advantage for usability testing is the next step. A seamless all-mobile experience is quite a few steps further away.

**Responsive rejection**

Providing households with quick access to web surveys directly from an electronic approach message is not currently possible for the ABS. Our household surveys are conducted on a geographical sample frame basis, where the specific dwelling address is selected. Contact with the household begins with a physical letter, and the absence of a national population register means we know little to nothing about that household in advance. Web login credentials are provided to respondents on paper, and email addresses and phone numbers are usually obtained through respondent-initiated contact.

Phone data collection and mobile-based respondent engagement more broadly is increasing. SMS has been used at the ABS for some time as a household survey reminder strategy, and some advances in use of commercially available phone lists have been made especially during COVID-19 based grounding of our field interviewers. One CATI survey actually using a mobile survey frame was commissioned by the ABS to gather data *about* us in May this year. An experiment embedded in this survey on use of SMS for following up non-respondents illustrated the mixed results of using mobiles: if interviewers were able to make contact, SMS improved participation. But overall response rates were *lowered* by the use of SMS as it allowed an explicit opt-out before making contact. The convenience factor was demonstrated beautifully, with 99% of texted refusals being sent within 24 hours.

**Conclusion**

It’s too soon for ‘mobile-first’ as a general rule across our statistical data collections. Prioritising this mode risks lowering usability and thus data quality from our other modes. But mobile-friendly design is necessary and demand is growing, so our use of mobile-based technology and good questionnaire design needs to keep up.

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