Device choice in a mixed-device online panel survey

Keywords: smartphone, tablet, sequence analysis, mobile device, respondents' characteristics.

1. INTRODUCTION

Recently, there has been a big trend in the direction of online surveys, motivated by the need to reduce costs of data collection, follow advances of technology, and increase the efficiency of the data collection. Further, with the recent Covid19 pandemic, the need to move to online data collection has become even more urgent.

Given the widespread use of mobile devices (i.e. smartphones and tablets), web surveys can also be completed using mobile devices, if these are not explicitly disallowed. This situation means that nowadays when a web survey is run, a mobile web survey is taking place. The spread of mobile devices is also inducing NSIs to adopt a mixed-mode and even mixed-device approach. Further mobile technologies also allow researchers to introduce innovations in data collection.

Several issues are related to the use of mobile devices for online survey data collection. These are related to the fact that devices differ with respect to some digital and format characteristics. As regards individuals, not all subgroups have access to mobile devices to the same extent.

In order to understand how to make mixed-device online data collection work more effectively, it is important to better understand the response process in online surveys and, particularly, issues related to the use of different devices for survey completion purposes. Even though the literature on mixed-device is relatively limited and mainly focused on experiments and panels not in the field of Official Statistics, the study of these issues is also important in the context of Official Statistics in order to support design choices.

This analysis uses the Understanding Society Innovation Panel, a longitudinal panel that currently has eleven waves of data available. Starting from Wave 5, two-thirds of sample units were approached in a sequential mixed-mode design with web followed by face-to-face. From Wave 8, it was possible to complete the survey using any device (namely, PC, laptop, tablet, or smartphone).

The aim of this paper is to investigate whether and how device use changed across waves of the panel and which socio-demographic and behavioural characteristics of respondents are associated to different device choices.

2. METHODS

Subsection 2.1 provides information on data used for the analysis. Subsection 2.2 describes the adopted methodology.

2.1. Data

The Understanding Society Innovation Panel (IP) is an ongoing longitudinal survey which has collected data in annual waves since 2008. The target population for the Innovation

Panel is all individuals aged 16 or over and living in England, Scotland, or Wales. All samples are stratified, clustered, probability samples of persons [1].

The IP involves interviews at 12-month intervals with the initial sample members and all members of the current household of each sample person. Interviews cover a wide range of topics, such as household dynamics, economic activity, income, health, housing, and political attitudes.

From Wave 5 onwards, the IP was used to investigate the use of web interviewing. The web mode was incorporated into a sequential mixed-mode design (web and face-to-face) to study potential reduction of survey costs and quality improvement [2]. Specifically, at wave 5, two thirds of the sample were randomly allocated to a mixed-mode design and one third was randomly allocated to a face-to-face only design. The allocation was at the household level. The experiment was continued in the same way and with the same treatment allocation at subsequent waves. Given that the focus of the paper is on response by web, the sample used for the analyses is restricted to the mixed-mode component only.

As for fieldwork procedures, adult sample members were sent an invitation to participate to the survey by web. The letter included the URL and a unique user ID, which was to be entered on the welcome screen. A version of the letter was additionally sent by email to all sample members for whom an email address was available. Sample members who had not completed the web interview after two weeks were sent a reminder by post and interviewers then started visiting them to carry out face-to-face interviews. Starting from Wave 8 of the panel, it was possible to access the web survey using any internet-enabled device.

2.2. Methodology

To investigate the use of devices across waves, first frequency distributions are considered. Second, some tools from sequence analysis are used to analyse the sequences of device used across waves.

Finally, in order to study characteristics of people using different devices and investigate the stability of these characteristics across waves, the analysis is restricted to respondents that answered the survey via web at each considered wave. Starting from the results from the sequence analysis, respondents are classified into three categories: those that mainly responded using PC/laptop, those that mainly responded using tablet, and those that mainly responded using smartphone. A multinomial logistic regression is fitted to explain device choice across the four waves of the panel.

3. RESULTS

Table 1 reports the distribution of device used at each wave. PC/laptop remains the dominant device over the four waves. However, it clearly appears that the use of smartphones and tablets for survey completion increases across waves of the panel.

Table 1 does not provide information about the stability of device used across waves. In order to check whether the device choice is consistent across waves, some tools of sequence analysis are applied. A sequence is defined as an ordered list of elements, where the positions of the elements are fixed and ordered by time. The interest in sequence analysis is in the sequential character of all elements together. Figure 1 represents the so-called sequence index plot, which draws a horizontal line for each device sequence, separating different devices with different colors [3].

Table 1. Distribution of device used for web respondents.

	Wave 8	Wave 9	Wave 10	Wave 11
PC/laptop	70.88	66.09	62.24	59.91
Tablet	22.59	27.55	27.43	27.93
Smartphone	3.71	5.96	10.32	12.16
Other	2.82	0.40	-	-
N	673	755	678	691

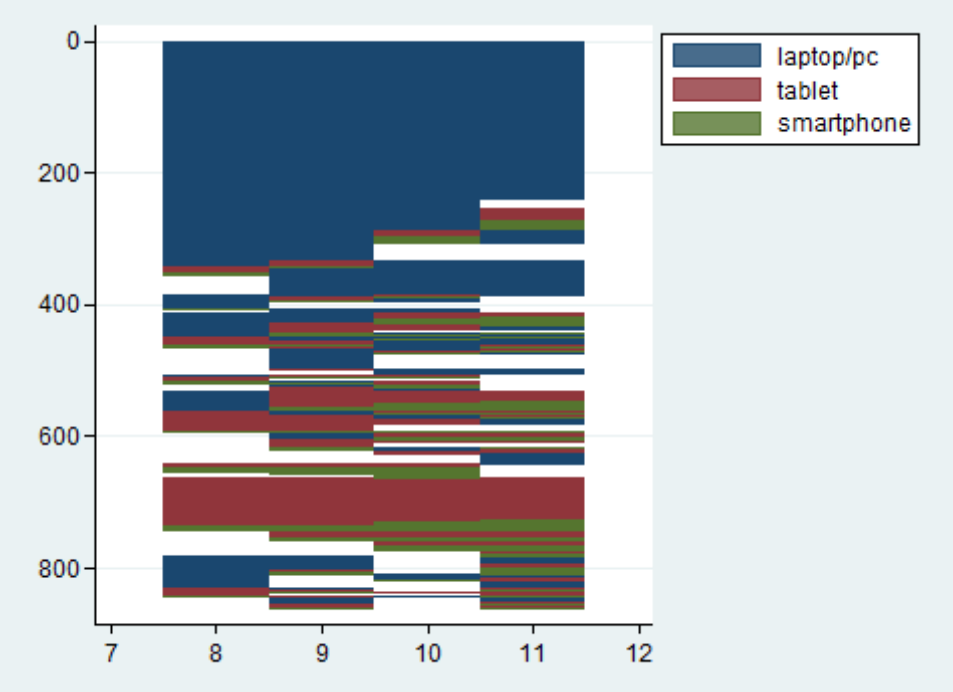

Figure 1. Sequence index plot with order from optimal matching.

From the graph, it appears clearly that the most frequent sequence is that of respondents that always answered the survey using PC/laptops. From the graph, it also becomes apparent that device choice is rather consistent over waves.

Next, the analysis is restricted to panel members that answered the survey by web at each wave (8-11). On the basis of results from sequence analysis, respondents are devided into three groups: those that responded mainly using PC/laptop, those that responded mainly using tablet, and those that responded mainly using smartphone across the four waves. The group is assigned looking at the prevalent device used for answering. Among the 487 panel members that responded via web across Waves 8-11, 69.82 percent (340 respondents) mostly responded using PC or laptop, 24.84 percent responded mainly using tablet (121 respondents), and 5.34 percent responded mainly using smartphone (26 respondents).

Results from the multinomial logistic regression to explain responding mainly using tablet or smartphone versus responding mainly using PC/laptop allow to conclude the following:

- Age has a negative association with responding mainly using tablet, compared to responding mainly using PC/laptop.
- Being a webuser, having a smartphone, and being a frequent smartphone user are strong predictors of responding mainly with a smartphone, whereas being a frequent tablet user is a strong predictor of responding mainly using a tablet.

- Browsing websites and checking emails on smartphones are strong predictors of responding mainly with a smartphone, whereas posting social media content using tablet is a predictor of responding mainly with a tablet.
- Posting social media content using a smartphone is negatively associated to responding mainly using a tablet.
- Stated willingness to complete a survey online via a mobile browser using a tablet is a predictor of responding mainly with tablet.

More detailed results on the use of mobile devices across waves and respondents' characteristics are reported in [4].

4. CONCLUSIONS

This paper investigates whether and how device use changed across four waves of the Understanding Society Innovation Panel and which socio-demographic and behavioural characteristics of respondents are associated to different device choices. Novel evidence on device choice, device choice stability and characteristics of respondents selecting different devices is provided. In this respect, there is still not much literature, even though it is growing.

The analysis shows that mobile devices are increasingly used for survey completion and respondents' device choice is rather consistent over time. As for characteristics of respondents selecting different devices, the reported analysis highlights some socio-economic factors that characterize the propensity to use the different devices. Factors already found in the literature are confirmed, such as females and young being more likely to use mobile devices. The analysis of variables relating to usage and possession of the devices suggest that these are strong predictors of tablet and smartphone use for survey completion. These factors are stable over time.

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