

Smartphone Usage in Establishment Surveys: Case Studies from Three U.S. Federal Statistical Agencies¹

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Introduction

Many years ago, survey organizations were focused on converting paper instruments to web questionnaires (Couper 2000). These days, offering respondents the ability to complete self-administered surveys online rather than mailing back a paper questionnaire is a fairly standard practice (Snijkers and Jones 2013; Barlas 2015). Internet data collection is often thought to achieve higher or comparable response rates and data quality at a lower cost than other methods.

Unlike paper surveys, however, survey designers do not have complete control over how the questionnaire appears to the respondent. A respondent can access the online survey in a variety of ways beyond the desktop or laptop the survey designer likely intended. As one prominent researcher notes, “if you’re doing an online survey, you’re doing a mobile survey” (Link 2013).

This lack of control has led to research into the impact of smartphones on online survey data collection, including effects on data quality and response rates (e.g., Antoun et al. 2017; Barlas 2015). Overall, this research shows that unit and item nonresponse tends to be higher on smartphones compared to PCs and tablets, response error tends to be higher due to visibility issues related to small screens, and smartphone users provide shorter answers to open-ended questions and take longer to respond compared to tablets and PC users. However, differences in response error tend to be small and respondents using smartphones tend to provide similar responses to those responding via a tablet or PC (Tourangeau et al. 2017).

To account for the increase in smartphone usage, more surveys are being “mobile-optimized,” where the survey takes advantage of best practices for rendering questions on small screens. This also allows for the survey to be displayed appropriately on tablets and other types of

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devices. Whether this approach changes the impact of the screen size on response is generally unexplored, however.

Thus far, most of the research on smartphone usage in surveys has been focused on household or social surveys, but, as with many other features of survey design, establishment survey respondents can have a very different response experience and also need to be considered. In particular, survey mode may have more of an impact on the response process for establishment respondents than household respondents as response to establishment surveys tend to a) rely on records, b) involve multiple individuals who are involved in completing the survey request, and c) be lengthy and complicated. Establishment survey respondents are often assumed to use desktop or laptop devices to complete surveys, though we have not found empirical evidence supporting this assumption. Although establishment surveys have been pushed to web reporting as a cost savings measure, they have not experienced a push for mobile optimization as have household surveys.

This leads us to wonder if establishment surveys should be concerned about data coming in via mobile devices. We know that not all business respondents sit behind a desktop computer for the majority of their day, and as the workforce gets younger and the nature of the economy shifts, it seems likely that more respondents may be interacting with our survey requests via devices other than their computers, including their smartphone. Not optimizing establishment surveys for a mobile device could negatively impact response rates and data quality.

The United States features a decentralized statistical system with 13 principal statistical agencies. This means that each agency sets up its data collection differently. There is no consistency in survey design across agencies and there can, in fact, be considerable variation among surveys within a particular agency.

We have chosen five surveys from three U.S. statistical agencies that highlight differences in the complexity and length of surveys administered by each agency. Some surveys chosen are mandatory and others are voluntary; some are long and others are short. Using paradata, we will examine the frequency at which respondents are using mobile devices to complete these surveys and if there is variation in these rates by agency, survey and/or type of respondent. We hope that these case studies will prompt participants to examine their own surveys, evaluate how prevalent mobile device usage is and if design changes should be made to accommodate this new type of survey response.

Surveys

Bureau of Labor Statistics Internet Data Collection Platform

The Bureau of Labor Statistics (BLS) has a central internet data collection platform that serves as the entrance point for all establishments reporting via the web. This platform is designed to allow respondents to easily report their requested data over the internet. Instruments on the platform have undergone usability testing. All development and evaluation work has been done using desktop computers, and currently the platform is not optimized for mobile devices (e.g., the screen will render the same way regardless of the device used to view it).

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There are two versions of the platform -- one that presents data from a prior wave to the respondent and one that does not -- that have implications for the login process. For the former, respondents are asked to enter a BLS-assigned account number and password and on their initial login to enter their contact information (including business mailing address and physical location address) before selecting from a list of surveys they have been sampled to complete. For surveys that do not present prior wave data to respondents, the security requirement is less stringent: respondents are asked to enter only a BLS-assigned account number and complete a CAPTCHA task. No password or confirmation of contact information is required.

BLS Annual Refiling Survey

A mandatory survey in 26 states, the BLS' Annual Refiling Survey (ARS) is sent to 1,200,000 establishments with at least three employees but only one location. Firms with multiple locations are given a different survey to allow them to report on all their locations. ARS respondents only have one question to answer. After reading a description of the industry that BLS has assigned to their establishment, they are asked to confirm or correct it. Establishments are sampled once every three years. Respondents receive an email or letter (depending on the information available) with the login information and a link to the data collection website. No paper or phone collection is offered to respondents; they must report online.

BLS Job Openings and Labor Turnover Survey

The Job Openings and Labor Turnover Survey (JOLTS) is a voluntary monthly BLS survey of 16,000 nonagricultural establishments. Letters are sent to respondents each month requesting their participation. The initial mailing includes a paper questionnaire to show respondents what type of information they'll be asked to provide (number of employees, job openings, hires, and separations), and gives them a place to record their monthly data to facilitate reporting. For the first six months, respondents provide information via the telephone (CATI). At that point, after learning the data elements and definitions, respondents are given the option to report via the web, fax, email, or mail. CATI is offered to respondents who are not willing or able to self-report. Respondents stay in the JOLTS survey for 24 months, typically using the same reporting mode for months seven through 24. The length of the JOLTS survey is dependent on the number of employee hires and separations occurring within a given company.

National Agricultural Statistics Service Web Data Collection

The National Agricultural Statistics Service (NASS) recently developed a new questionnaire development platform, *Survey Designer*. This platform allows methodologists to build web surveys that are dynamic and user friendly. Surveys built in the new platform will have interactive features such as skip logic, edit checks, and piping of currently reported data. Web surveys will also utilize responsive design to ensure respondents are provided a user friendly questionnaire no matter what device they are using. The 2017 Census of Agriculture was the first survey instrument created in this new system. All surveys conducted after August 2018 are required to be built in this new platform.

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To access web surveys, respondents log in to NASS' Mobile Optimized Survey Tool (MOST) using the link and unique survey code found in the initial mailing. Upon logging in and updating their contact information, all surveys for which they have been sampled will be displayed in a list. Respondents then select the survey they wish to complete and are transferred to the Survey Designer platform to complete the survey.

NASS 2017 Census of Agriculture

The Census of Agriculture (COA) is a complete count of U.S. farms and ranches and the people who operate them. It is conducted once every five years and participation is mandatory. The COA questionnaire is lengthy (24-page paper form) and complex and collects information on land use, production practices, income and expenditures, and farm operator characteristics. An invitation letter and paper questionnaire are mailed to approximately 3 million known or potential farms and ranches. In the invitation letter, respondents are instructed to respond via a self-administered paper instrument or the web. Nonresponse follow-up is conducted using self-administered paper questionnaire, web, phone and in-person enumeration.

NASS 2018 June Crops Agricultural Production Survey

The Crops Agricultural Production Survey (APS) is a voluntary, quarterly sample survey. The survey provides estimates of crop acreage, yields and production, and quantities of grain and oilseeds stored on farms, though the data collected on those topics varies with the season. In March, farmers' planting intentions are collected. In June, the number of acres planted and acres expected for harvest are collected. Data on small grains acres harvested and produced are collected in September, while row crop and hay production data are collected in December. Information on grains or oilseeds stored on the farm are collected during all four quarters. The Crops APS survey is relatively short compared to the COA (9-page paper form). As with the COA, respondents are sent an invitation letter instructing them to respond via a self-administered paper instrument or the web. Nonresponse follow-up is conducted using self-administered paper questionnaire, web, phone and in-person enumeration.

National Center for Science and Engineering Statistics Data Collection Platforms

The National Center for Science and Engineering Statistics (NCSES) is a federal statistical agency within the National Science Foundation (NSF). As one of the smallest of the 13 principal federal statistical agencies, most of the surveys are conducted not by the agency itself, but by contractors to the agency. Each contractor has its own data collection system; as a result, surveys are not consistent in look and feel. Though each survey instrument has undergone usability testing, the amount of testing has varied by survey (and by survey contractor). Though some NCSES surveys have been optimized for collection from mobile devices, none of the agency's establishment surveys have undergone this process.

Regardless of platform, respondents are provided with the necessary information for logging in and creating an account. Some platforms allow for coordination among multiple individuals within an establishment. In these cases, the main contact is capable of giving limited or full access to others within their company or organization. For example, the main contact can delegate the completion of specific sections to User A, and other sections to User B.

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NCSSES Higher Education Research & Development Survey

The Higher Education R&D (HERD) Survey is the primary source of information on R&D expenditures at U.S. colleges and universities. The data collection agent is a privately-owned contractor. Conducted annually, it is a census of all institutions with at least \$150,000 in R&D expenditures that have been accounted for separately in the fiscal year. Approximately 900 institutions are in HERD, and though the survey is voluntary, response rates in recent collections have consistently exceeded 95 percent.

Institutions receive one of two questionnaires: the Standard form (for institutions with at least \$1 million in R&D expenditures), and the Short form (for institutions with less than \$1 million in R&D expenditures). The HERD-Standard questionnaire asks respondents to report detailed R&D expenditures on a wide variety of topics such as funding source, field of research, type of research, funding from foreign sources, and data regarding clinical trials and medical schools. It also collects headcounts for R&D principal investigators and all other R&D personnel. The HERD-Short questionnaire is a much smaller data request. It asks respondents to provide details on R&D expenditures by funding source and by field of research, and asks a few other background questions.

When the survey is launched, respondents are sent an email that contains a link to the survey, and their institution's identification number. Since the population remains fairly stable over time, respondents can use their password from the prior survey cycle to log in or request a new one. Respondents can report via web or paper instrument; non-response follow-up is conducted via telephone and email.

Case Studies: Response by Mode

We thought it would be useful to include a high-level table that illustrates how our case studies vary in terms of response by mode (Table 1). Our presentation in Lisbon will provide additional details on the various devices used at several points in the response process.

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Table 1. Response by Mode

	Overall Response Rate	% Web	% Mail	% Interviewer (CAPI, CATI, etc.)	% Other
BLS:ARS	79%	100%	Not offered	Not offered	Not offered
BLS: JOLTS	65%	59%	Not offered	34%	5% (email)
NASS: Census	65%*	24%	69%	4%	3% (email, fax, incoming call)
NASS: APS	54%	3%	23%	72%	1% (email and fax)
NCSES: HERD Short	96.5%	100%	0%	Not offered	0%
NCSES: HERD Standard	97.8%	100%	0%	Not offered	0%

*Interim response rate as of June 30. Data Collection ends July 31.

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