The National Survey of Fishing, Hunting, and Wildlife-Associated Recreation
Cell Phone and Debit Card Test
A Cost -Benefit Analysis

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Abstract

The 2011 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation (FHWAR) is an address-based sample survey with interviews conducted by Computer-Assisted Telephone Interviewing (CATI) and Computer-Assisted Personal Interviewing (CAPI). We conducted a cell phone and debit card test to research alternative survey designs that might increase the number of less expensive CATI interviews completed, and do so in a cost-effective manner. This test consisted of 1,411 households, for which no telephone number was available, that were randomly assigned to one of three treatments. The first treatment was sent an advance letter with a cell phone. We sent a postcard a week before the cell phone mailout informing the sample that they would be receiving a package in the mail with a cell phone in it. The second treatment received an advance letter with a $25 debit card incentive. The third treatment received only an advance letter. The letters for all three treatments emphasized the cost savings of conducting a telephone interview and requested that the respondent call the telephone center to complete an interview. We compared the results from the cell phone and debit card test to our production CATI and CAPI samples to evaluate whether either of these test options are viable alternatives to collecting data through a personal visit when we have an address but no telephone number. The results show that the incentive (debit card) got a better response rate than the cell phone treatment and, when it comes to determining if it could be used in production, the results indicate that it is possible but would be very expensive to do.

Introduction

How do we reach our survey sample in a cost effective way, maintain survey response rates, and avoid an increase in survey bias? These are among a great number of questions being asked by researchers every day, especially with response rates decreasing for surveys (De Leeuw and DeHeer 2002; Atrostic, Bates, Burt, and Silberstein, 2001; Baruch, 1999; Deheer, 1999; Steeh, 1982) and an increasing proportion of the population relying on cell phones as their main source of communication. In the first half of 2010, for example, more than one in four American households (26.6%) had only wireless telephones— an eightfold increase over just 6 years (Blumberg, and Luke 2010) and a number that is sure to increase each year. This high number of wireless-only households might offer an explanation as to why phone cooperation is on the decline, as cell phones are not listed in public directories or vendor lists that use reverse-address searches to locate phone numbers. Even reachable by a cell phone, depending on the nature of the survey, respondents might not be as forthcoming as they would have been if they were in the confines of their home using a landline, which can affect the quality of the data (AAPOR Cell phone Task Force 2010). Surveys are also competing for the same pool of participants. In light of this, researchers are trying to come up with ideas that would make their survey stand out among the many so as to yield a high response rate.

The National Survey of Fishing, Hunting, and Wildlife-Associated Recreation (FHWAR) is sponsored by the U.S. Fish and Wildlife Services. It collects information regarding fishing, hunting, and other wildlife-associated activities. FHWAR is a multistage probability sample of households with coverage in every state. The survey is conducted every 5 years and is done in 3 waves. Wave 1 is household-based and consists of a screener with the possibility of detailed interviews asking about a person's hunting, fishing or wildlife-watching activities. Wave 2 and Wave 3 are person-based, detailed interviews where respondents are selected for sample based on data collected during the Wave 1 screener. FHWAR uses Address-Based Sampling (ABS) methods to select the initial Wave 1 sample. ABS involves drawing addresses randomly from a frame of addresses. The primary advantage to using ABS is that it provides a very high level of coverage, with some estimates placing frame coverage of U.S. residential postal households in the mid-90 percent range. With appropriate tools, ABS cases can be associated with telephones numbers for a telephone survey, or ABS cases can simply be used as is to conduct personal visit interviews. In some instances, the kind of survey being conducted dictates what interview mode to use, but cost constraints are often of paramount importance. It is a well established fact that personal visit interviews tend to cost considerably more than telephone interviews.

In 2006, the FHWAR survey was conducted in CAPI. In 2011, the interviews were done in both CATI and CAPI. The initial plan was for the interviews to start in CATI and then, after a few weeks, transfer cases that could not be contacted to CAPI. Faced with increasingly high costs of the personal visit interview component of the survey, research was conducted during the survey's 2011 implementation to explore possible methods for increasing the number of CATI interviews. Of course, costs could be reduced by sampling cases for CAPI follow-up at a lower rate. A major downside of such a strategy, however, would be reduced precision and increased variance of survey estimates. The 2011 study examined two somewhat costly but potentially beneficial new strategies for increasing the proportion of CATI interviews among the non-telephone portion of the sample; send respondents either a cell phone or debit card incentives with an advance letter requesting that they call us to complete an interview.

Much research has examined how incentives affect response rates in telephone, mail, and personal visit surveys (e.g. Dillman 1978; Singer et al 1999; Willimack et al 1995; Armstrong 1975; and Gunn and Rhodes 1981). However, the research base is scarce regarding the effects of sending a pre-paid cell phone or Smartphone on telephone survey response rates. A very small NORC study [2009 NIS Methodology Report] may constitute the only relevant research to date. This study sent pre-paid phones to 40 sub-sampled households in both Arizona and Michigan to try and obtain an interview by telephone. In Q1/2008 for both Michigan and Arizona a combined total of 8 interviews were completed, but none were completed in Q2/2008.

The purpose of our study was to compare the CATI response outcomes for the three treatments (cell phone treatment, $25 debit card incentive treatment, and letter only treatment), and, in the event of positive impacts on response, to assess the success of the experimental treatments from a cost-benefit perspective.

Methodology

The sample for the study came from the Master Address File (MAF). The MAF is a file that is strictly for the use of the Census Bureau, covers all geographical areas in the country, and includes all housing units. It is updated every six months. Only sample addresses without a phone number were eligible for selection for this study.

All treatments were sent a similar advance letter explaining that personal interviews are expensive and that we were trying to reduce costs by conducting the interview over the phone but did not have a telephone number for them. We further requested they call a toll-free telephone number to participate in the 2011 FHWAR survey. For the cell phone treatment, we mailed the participants the advance letter with the cell phone informing them that we were sending them a cell phone in hopes of connecting with them via the phone. Prior to mailing, we sent a postcard informing the participants that they were going to receive a cell phone in the mail. The debit card treatment received the advance letter with the $25 debit card enclosed. The control treatment received the advance letter only.

The cell phones sent to the cell phone treatment were Verizon pre-paid phones, costing $19.99, with $30 worth of minutes (160 minutes of talking time) included, for a total cost of $50. Each cell phone was assigned a phone number associated with the central time zone (CST), in accordance with instructions for the Census interviewers to call between the hours of 2pm-9pm EST in order to limit their calls to reasonable hours no matter what area of the country was being called. For the debit card treatment, respondents were informed in the advance letter that they would be given the PIN (personal identification number) to activate the card upon completion of the survey.

This study was comprised of two phases. In the first phase, letters were sent to 1,411 no-phone cases, of which more than half from each treatment came back as Undeliverable As Addressed (UAA's).[1] We conducted a second phase where we selected an additional 220 cases per treatment from the MAF.[2] For the purpose of this paper, only the results from the second phase will be discussed as it is more comparable to our production-sampling scheme.

Results

Table 1. Response Rate

Panel	N	Completed	Response Rate
Cell phone	220	30	13.6%
Incentive	220	33	15%
Letter	220	11	5%

The results from the second phase show that the debit card incentive treatment had the highest response rates. The response rate for the debit card incentive was 15%, cell phone was 13.6% and the control was 5%. When comparing the panels for statistical significance we find that the difference between the debit card incentive panel and the cell phone panel did not differ significantly, but both were significantly higher than the letter only panel.

[1] The Office of Management and Budget (OMB) required that the study only use no-phone sample address for which the phone number was also blank in the 2010 Census. Moreover, the MAF, from which the sample was drawn for the first phase, had not been updated with permits, constructions, or vacants. We believe these two factors contributed to the unusually high number of UAAs.

[2] OMB lifted the "no-phone sample address" requirement for the second phase of the study. In addition, the MAF had been updated to incorporate permits, constructions, and vacants.

Cost Benefit Analysis

As mentioned earlier, FHWAR production consists of two modes, first CATI and then CAPI, for cases for which a phone interview cannot be completed. The study was conducted in CATI with no follow up interviews. So, in doing the cost-benefit analysis, comparisons had to be done in two parts; calculating the cost of doing the interviews in CAPI without follow-up and then estimating what the cost would have been if the study was done in mixed mode, like the production survey. The cost-benefit analysis concentrates on the debit card incentive panel because the response rate shows that this incentive panel outperformed both the more expensive cell phone panel and the control panel.

For cost-benefit calculation purposes, we assume that the average cost to conduct a personal interview P (i) is $250, including the cost of non-interviews (Census Internal Budget Memo 2011). . The cost to conduct an interview by phone T (i) is assumed to be $67 (Census Internal Budget Memo 2011). Non-interviews by telephone T (ni) cost 1/3 as much as completed interviews. Using those numbers we try to get a baseline for the three treatment panels.

Based on the personal visit cost of $250 per case, sending all 220 cases directly to CAPI would have cost $55,000 (i.e., 220*250). As seen in Table 1, the $25 dollar debit card yielded 33 CATI interviews, leaving 187 cases to be sent to CAPI. Using the cost assumption above, the 33 interviews completed in CATI cost $3,036 (i.e. 33*(67+$25) ($25 = cost of the card)). The 187 cases sent for CAPI interview would cost $46,750 (187*250), resulting in a total cost for this treatment of $49,786. Using the incentive in a mixed mode design results in a cost savings of approximately 10% compared to what it would have cost to send all cases to CAPI for interviewing.

Conclusion

We carried out this study to investigate alternative survey designs that might increase the number of CATI interviews completed, and do so in a cost-effective manner. Do the results show enough evidence that an alternative survey design, namely this one, could be used in future production surveys? The answer is inconclusive and we provide an explanation below.

One of the best measures to judge how well any survey is doing is by looking at the response rates. And, yes, response rates were low. However, the debit card incentive panel outperformed the other two treatments. This is in line with Dillman's theory of social exchange which states that people who participate in surveys will be compensated in a way that meets their needs (Dillman 2000). As the debit card incentive panel outperformed the other panels, we could infer that it could work on a large scale survey, with further research.

Another measure to evaluate a study like this is to look at coverage. Were we able to expand our coverage to include any demographic groups that had been missing or underrepresented in past rounds of the FHWAR survey? In comparison to historical FHWAR survey data, it does not appear so. In production, African Americans are underrepresented. The sample underrepresentation occurred with this study. We see from the debit card treatment and the other two treatments that a majority of the completed interviews were from white respondents. Could this be a result of the way the sample was drawn or is it just the nature of the survey? We do not know, but more research needs to be conducted to answer such questions.

The next and probably more important measure is the cost of conducting this study. Is the cost of doing this study worth it? For instance, can the $25 debit card incentive, which had a higher response rate than the other treatments, be used in actual production when dealing with a large sample size? We believe that this study shows that it can be done in actual production but would be costly.

There are still areas that could be looked into for future research. For example, is there a difference in reported expenditures between the three treatment panels and between the treatment panels and production? Also is there a difference in the frequency with which respondents hunted or/and fished between the treatment panels and between the treatment panels and production? Because the sample size for this study was small, we could not report on the results with any confidence.

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