

Multimode Strategies for Designing Establishment Surveys

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Abstract

Design strategies are discussed that improve participation from law enforcement agencies by showing the data collection modes that these agencies prefer. The overarching design objective is to capitalize on the various means that many agencies and establishments have to participate in sample surveys. For example, most establishments have faxing capabilities, internet access, and employ computer literate staff. This was the case for agencies in the Survey of Law Enforcement Forensic Evidence Processing. Participants in this national probability sample of 3,153 law enforcement agencies were given a choice of one of four modes for participation. Several comparisons are made for the different modes including; comparisons by type of agency, size, and census region. This research will contribute to a better understanding of modal choice and cost efficiency for establishments and agencies.

Key Words: Response rates, mode choice, mode preference, survey design

1. Introduction

Researchers have seen survey response rates decrease over the last several years (1, 2, 3). This has increased the potential for survey estimates to be biased due to increases in survey nonresponse (4, 5). According to Groves et al. (6), the connection between nonresponse rates and nonresponse bias comes from the presence of a covariance between response propensity and the survey variables of interest. Hence, it is essential that attention is given to designing sample surveys such that response rates can be maximized as well as the implementation of corrections for unit nonresponse as appropriate. On the other hand, we can not ignore the cost implications that accompany maintaining this level of awareness. The ultimate challenge is to design cost efficient sample surveys that maximize participation while meeting study objectives. This research is an attempt to provide some insight for modal choice or preference in the design of establishment surveys with special emphasis on governmental agencies at the state, county, and local levels.

2. Sample Design

The Survey of Law Enforcement Forensic Evidence Processing LEFP sampling frame of state and local law enforcement agencies was based on the Bureau of Justice Statistics (BJS) national 2004 Census of State and Local Law Enforcement Agencies (BJS, 2007). The 2004 Census represents nearly 18,000 State and local law enforcement agencies with the equivalent of at least one full-time officer operating in the United States.

Excluded from the sampling frame were special agencies such as agencies associated with colleges/universities, medical schools, public school districts, public housing, and

tribal agencies. Information provided by BJS was also used to remove sheriff's departments that had no law enforcement investigative function. These ineligible units primarily involved sheriff's departments that provided security for jails and courts but no department to investigate crimes as part of their regular functions. As a consequence, the sampling frame was based on a total of 15,625 law enforcement agencies. Our sampling approach follows similar methodology used by the BJS Law Enforcement Management and Administrative Statistics (LEMAS) surveys and the National Institute of Justice (NIJ) funded 2002 National Forensic DNA study.

The LEFP sampling frame was explicitly stratified by a combination of type of law enforcement agency and size of agency. The levels of agency type were the state police departments, municipal police departments, and sheriff departments. Agency size was defined as full-time sworn personnel or full-time equivalents. The agency size categories used included agencies that had (1) 100 or more officers, (2) 50 to 99 officers, (3) 25 to 49 officers, and (4) fewer than 25 officers. Agencies with 100 or more sworn officers were included with certainty. For the balance of the agency population, an equal probability sample was selected within each stratum combination of agency type and agency size for a total of 3,152 agencies. After sample selection, one additional municipal police department with 100 or more officers was determined to have been omitted from the sampling frame prior to sampling. Due to the size of this agency, it would have been selected had it been on the frame when the sample was selected. Therefore, this large agency was given an opportunity to participate in the study as well. The objectives of the study was to characterize the backlog of criminal cases and forensic evidence existing at law enforcement agencies that awaited submission to crime laboratories. Estimates needed included number of criminal cases existing and size of the backlog of forensic evidence.

Sample agencies could choose to complete the hardcopy questionnaire mailed to them and then return it in a self-addressed envelope. The respondent also had the option to fax the questionnaire back using the fax number provided in the information package. The third option was to call a toll free telephone number and complete the survey over the telephone. Included with the hardcopy instrument was also the web address to the study's website, and thus provided the opportunity for the agency's respondent to complete the survey via the web. Strategic findings are presented from the use of these data collection modes.

This sample survey was designed under the assumption that there were no significant mode effects, and thus made it possible to collect data using four different data collection modes. Each agency was given an opportunity to choose whether to complete and return a hardcopy mailed questionnaire, or to fax a completed questionnaire, or to complete an interview over the telephone using a toll free telephone number, or to complete the survey over the Web. The combination of these four approaches enabled the study to reach a response rate of 73%.

3. Data Collection Results

Table 1 summarizes the stratified LEFP sampling frame by agency size and type of agency, and Table 2 gives the number of agencies selected from each stratum combination. As given in Table 3, there were 3,094 eligible agencies in the sample with 2,251 that chose to participate in the study (Table 4). Response rate calculations are based

on the American Association for Public Opinion Research (AAPOR) rule #4, which is discussed in the Office of Management and Budget, 2006. (This rule determines response rates based on estimating the proportion of sample units with unknown eligibility to be eligible, rather than assuming that all unknown eligible units are eligible.) Although the overall response rate among eligible agencies was 73%, response rates varied by type and size of agency with the highest response rate (79%) for the two largest groups of municipal police departments (Table 4).

Table 1: Sampling Frame by Type and Number of Sworn Officers

<i>Agency Type</i>	<i><25 Officers</i>	<i>25–49 Officers</i>	<i>50–99 Officers</i>	<i>100+ Officers</i>	<i>Total Agencies</i>
Sheriff's Department	1,737	579	317	331	2,964
Municipal Police Department	9,649	1,556	807	600	12,612
State Police	0	0	0	49	49
Total	11,386	2,135	1,124	980	15,625

Table 2: Sample by Type and Number of Sworn Officers

<i>Agency Type</i>	<i><25 Officers</i>	<i>25–49 Officers</i>	<i>50–99 Officers</i>	<i>100+ Officers</i>	<i>Total Agencies</i>
Sheriff's Department	355	362	317	331	1,365
Municipal Police Department	376	391	372	600	1,739
State Police	0	0	0	49	49
Total	731	753	689	980	3,153

Table 3: Eligible Agencies by Type and Number of Sworn Officers

<i>Agency Type</i>	<i><25 Officers</i>	<i>25–49 Officers</i>	<i>50–99 Officers</i>	<i>100+ Officers</i>	<i>Total Agencies</i>
Sheriff's Department	341	355	311	320	1,327
Municipal Police Department	364	390	371	599	1,724
State Police	0	0	0	43	43
Total	705	745	682	962	3,094

Table 4: Responding Eligible Agencies by Type and Number of Sworn Officers - (Cell Percentage of Eligibles)

<i>Agency Type</i>	<i><25 Officers</i>	<i>25–49 Officers</i>	<i>50–99 Officers</i>	<i>100+ Officers</i>	<i>Total Agencies</i>
Sheriff's Department	216 (63%)	243 (69%)	232 (75%)	237 (74%)	928 (70%)
Municipal Police Department	239 (66%)	293 (75%)	292 (79%)	471 (79%)	1,295 (75%)
State Police	0	0	0	28 (65%)	28 (65%)
Total	455 (65%)	536 (72%)	524 (77%)	736 (77%)	2,251 (73%)

The agency choice rate is defined as the percentage of the number of agencies that chose to participate using a particular survey mode divided by the total number of agencies within a specific subgroup. For example, in Figure 1, 45% or 1,018 of all 2,251

participating agencies chose the Web. Over the four data collection modes, Web was the leading preference, followed by mail (42%), fax (11%), and lastly telephone (2%). The study’s website served as an excellent source of information and therefore could have been a deciding factor as to why most agencies chose the Web. Also, as agencies logged on the website to validate the study, they may have seen it more convenient to just complete the survey while already logged on. Hence, in Figure 2, Web was a close second (40%) for County Sheriffs compared to mail at 45%, then fax and phone at 13% and 2%, respectively. Almost half (49%) of municipal police departments chose to respond on the Web followed by 39% of the agencies by mail. Web was also the first choice (43%) for State Police Departments.

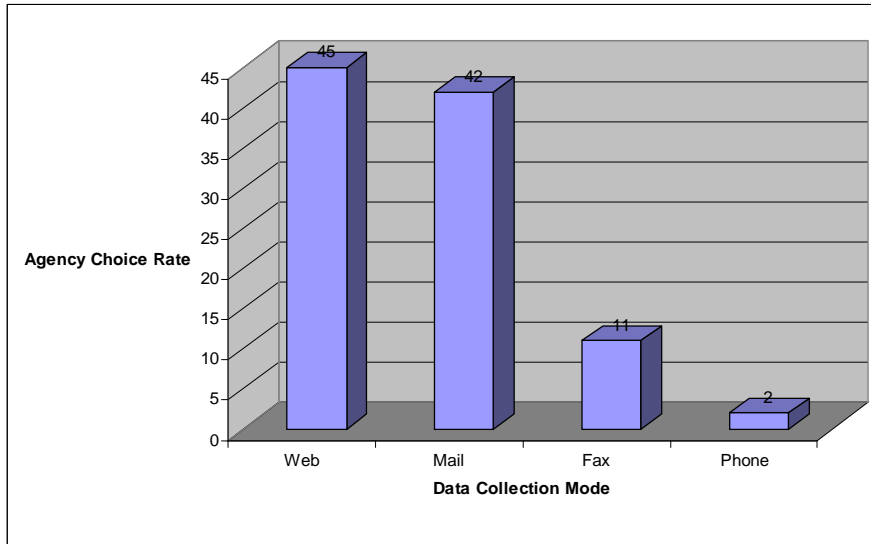


Figure 1: Agency Choice by Data Collection Mode

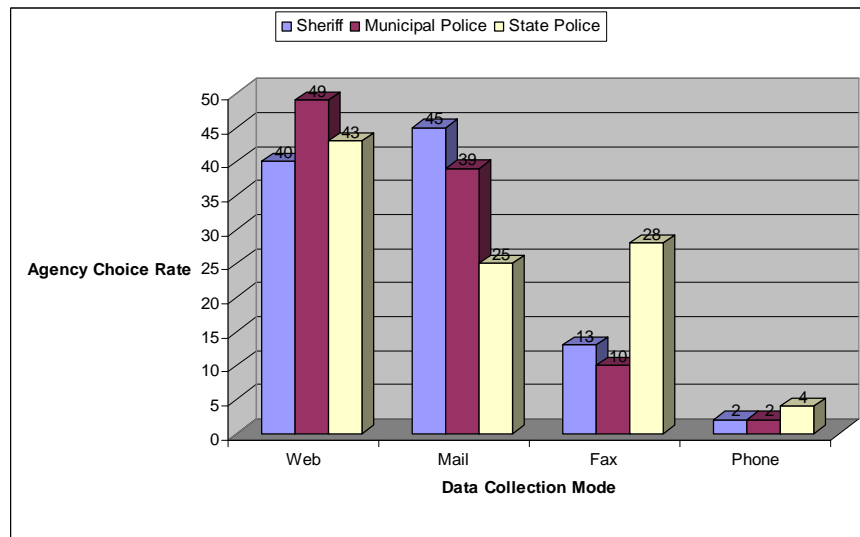


Figure 2: Agency Choice by Data Collection Mode and Agency Type

A comparison of modal choice by the four size categories is shown in Figure 3. Many of the smaller agencies appear not to have had internet access or may not have staff who were comfortable with a Web interview. This appears true based on mode results, for

example, the smallest agencies (< 25 officers) opted to return their surveys by mail (48%), and Web at 33% was a strong second. Web was the first choice (44%) and mail was the second choice (42%) for the next smallest set of agencies (25-49 officers). These preferences were also true for the other size categories. The leading choice for agencies with 50-99 officers and 100+ officers was Web followed by mail, respectively, 51% and 50% (Web); and 51% and 50% (Web); and 38% (mail) for both size categories.

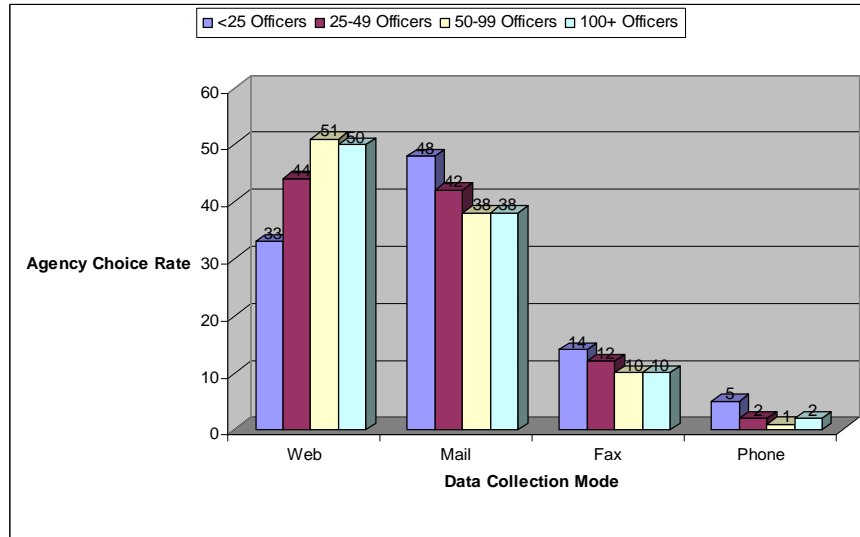


Figure 3: Agency Choice by Data Collection Mode and Agency Size

Census regional comparisons are presented in Figure 4. Web also appeared to be the modal preference for all 4 regions followed by mail. These first and second choices were led by the West (51%, 38%), Northeast (46%, 41%), Midwest (44%, 43%), and the South (43%, 42%).

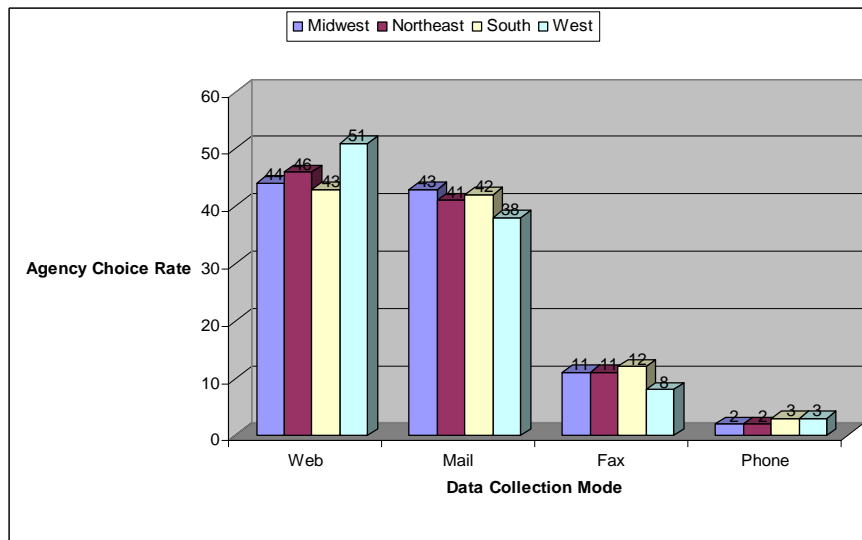


Figure 4: Agency Choice by Data Collection Mode and Census Region

4. Sample Weighting

In order to reduce potential bias due to non-responding agencies, the design weights for responding agencies were adjusted within cells indexed by predictors of response status, namely; the stratification variables (agency type and agency size). The sample design weights for responding agencies were adjusted upward to compensate for those agencies that did not respond. These weights were computed using RTI's generalized exponential models (GEM) software (Folsom and Singh, 2000). GEM is a raking procedure that is a generalization of the logic-type model, which has been proven to produce weights with less variability than what is achievable via traditional weighting methods, such as the historical weighting class method discussed by Siegel et al (2005), and Jones and Chromy (1982). GEM enabled the weighted agency data to better reflect distributions from the target agency universe with respect to the strata defined based on agency type and agency size. These were obtained by producing survey estimates that better represented the universe of agencies without significantly increasing the variance of the survey estimates.

5. Summary

Data collection results indicate that the agencies primary modal choice was the Web with 45% choosing this mode. Mail at 42% was a strong second followed by Fax at 11% and telephone at 2%. Internet access for state and local government agencies may not be equally accessible. Use may largely be associated with the size of the agency as well as accessibility differences by geographical region. Results suggest that 50% of the largest agencies chose the Web, while only 33% of the smallest agencies chose the Web. Although it is not clear why so few agencies chose a telephone interview, it is possible that many agencies found it easier to complete the survey online once they had logged on to confirm the validity of the study.

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