

METHODOLOGICAL AND CONCEPTUAL ISSUES IN THE DEVELOPMENT OF CUSTOMER SERVICE MEASURES FOR THE NATIONAL RECREATION RESERVATION SERVICE

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Abstract: The National Recreation Reservation Service (NRRS) customer service monitoring protocol includes methodological and conceptual issues related to opt-in and non-response bias across different reservation channels and stages of the reservation process. The limited available data show that opt-in rates and non-response bias may not be large in general, but might be quite problematic at times. The data suggest that monitoring processes should be continued and improved. The results also suggest that phone surveys are relatively bias-free and perhaps necessary for some user groups, and that quality assurance of email or internet surveys will be more difficult. Suggestions are offered to improve response bias checks and attain preferred quality standards.

Introduction

The National Recreation Reservation Service (NRRS) provides campsite and cabin reservations for U.S. Army Corps of Engineers (CE) and USDA Forest Service (FS) sites throughout the

United States. ReserveAmerica (RA) is a private company (a division of Ticketmaster) that provides access to over 140,00 campsites in 44 states and 1 province. RA's operations include over 45,000 reservable facilities at over 1,700 CE and FS locations under a contract with the federal agencies (cf. www.reserveamerica.com and www.reserveusa.com). The NRRS includes: 1. A phone center operation (RA's 800 number call-in subsystem), 2. Reserve-USA (R-USA), an internet based reservation subsystem (also operated by RA), and 3. Some on-site reservation and purchase capabilities (not studied herein as discussed below). The first two NRRS elements are the focus in this paper. As part of the federal contract, RA's performance must be periodically evaluated, and within this requirement, customer satisfaction evaluations are required for the R-USA internet and RA call-in subsystems. A pilot project was developed cooperatively among the principals to develop and test a scientifically defensible and accurate customer satisfaction measurement protocol. The NRRS, CE Waterways Experiment Station, FS R&D, and RA staff co-developed the survey protocol and instruments. RA conducted the surveys via contracts with commercial internet and phone survey firms (Dillman 2000; Absher 1998). This paper presents the results from one part of that effort, notably the methodological and conceptual issues that were encountered in the sampling and customer data gathering phases of the customer satisfaction study.

Overall, the pilot survey project team sought to develop a performance monitoring process that accurately portrayed key services important to the customer and related to the reservation process. As a pilot project, various issues were incorporated and six different surveys were used. The objectives for this paper are to look at the methodological issues that might show differences between internet and phone survey protocols, gauge the adequacy of opt-in and response rates throughout, and identify ways to improve sampling protocols for on-going contract administration.

Scope of Pilot Survey

The reservation process includes a number of steps, each containing important information relevant to customer satisfaction processes. Figure 1 shows this process from reservation to check-in and the associated issues or variables that need to be

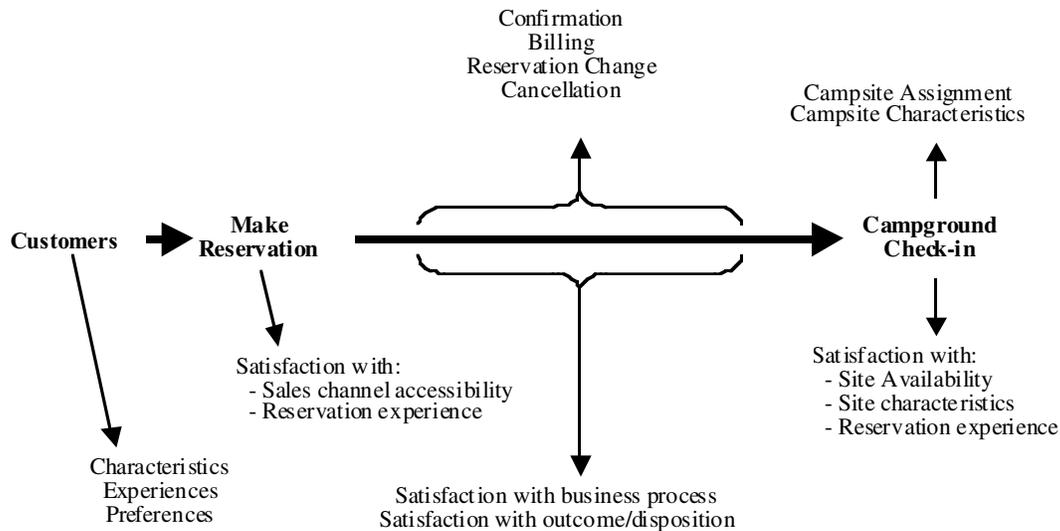


Figure 1. Scope of Pilot Survey: Reservation to Check-in

captured by the monitoring surveys. Note in particular that some items to be measured may occur months apart, e.g. a reservation can be made in April for an August camping trip. Thus, questions of recall and accuracy of responses are a concern. Methodological and data quality concerns also arise because of the multiple channels and sampling protocols used. First, in order to be included in the sample customers had to give prior consent. Due to privacy and policies, on phone and internet surveys there must be an explicit agreement to be contacted beforehand, or a positive opt-in response. Second, there are concerns about response rates across the different channels and different survey protocols used.

Methods

The focus of this paper is individuals who opt-in and make reservations¹. These “sales” are recorded as individual transactions, and one individual may choose to make multiple transactions at once or over time. The sampling unit is any transaction made through the NRRS/RA call center or the R-USA (internet) website. The names or addresses of those who are merely seeking information or do not make a reservation are not retained in any way. The actual pilot survey sample selection was made from the incoming stream of transactions that met the opt-in requirement (filtered). The timeframe of interest was June through August of 2002. During this time, 279,048 filtered transactions were made across all channels and both agencies. It is possible to make a reservation at a CE site in

person, but these “walk-ups” were outside the scope of the pilot study. Excluding them from the pilot study was an explicit decision and is addressed briefly later.

The sampling frame for the pilot survey was restricted to June - August 2002 reservations. For this paper, three sources of data are available. These are labeled pilot survey, opt-in and subsample in the tables below.

First is the data from reservations that were sampled and had a survey returned. This group includes all the actual pilot survey data from three subpopulations: internet-email (made reservation online, received survey via email), phone-phone (made reservation by phone, received survey by phone via a computer-assisted telephone interviewing (CATI) system) and phone-email (made reservation by phone, received notice via email with link to internet survey). Note that there are three main pilot survey subpopulations and only two survey modes: phone (CATI) and website. There are two website surveys because some call-in customers were surveyed through an

¹ About half (52%) of the reservation volume was excluded from this analysis. These are the “walk-ups” who made reservations directly at a campground or other site with an R-USA linked terminal (e.g., at a CE campground check-in kiosk). Although this omission was intentional in the pilot study, it is not intended to suggest that they be permanently absent from the customer service monitoring process. On-site reservations (walk-ups) should be considered for inclusion in future customer service monitoring protocols.

email message to click into a website to fill out a survey. For convenience, we refer to them as the email subpopulation. The content of the phone-CATI and phone-email surveys is the same as it was tied to the experience of using the phone center. The other website survey was tied to the use of the internet reservation portal and is referred to as the internet subpopulation. In the tables below there are six pilot surveys because each of the three main sources (internet-email, phone-email, and phone-phone) was further divided into two groups: one that received surveys immediately after the initial reservation session, and one that received surveys later after the camping trip was completed. Altogether, the six separate, mutually exclusive questionnaires in the pilot survey have 9,460 respondents.

Second are all the transactions from the larger pool from ReserveAmerica's operations, which includes ReserveAmerica's "opt-in/opt-out" records (n= 279,048). Third, there was a subsample of federal transaction records with limited reservation data attached (n= 715). The last dataset was requested because the larger transaction database (opt-in/-out above) had very limited transaction data attached that would bear on the response bias issue. Additional information about length of stay and type of site requested was obtained for this subsample. Because it could be further broken out into opt-in and opt-out groups it is possible to regard the subsample opt-in group as a strong surrogate for the non-respondents to the pilot survey, i.e., the pilot survey respondents are drawn directly from the group represented by the opt-in subsample and are a small percentage of the overall group (9,460 of 162,576 or less than 6%).

Results

Key Concern: Opt-In

The first issue is assuring the quality of the survey list from the larger pool of all reservations. Due to privacy concerns, those who make reservations must be asked separately and explicitly to be contacted in the future. All customers were asked to agree to be contacted again, or "opt-in." The opt-in process was an unknown factor as far as sampling bias or representativeness is concerned. Available data on opt-in rates by contact channel and primary residence are shown in Table 1.

Overall, about half of all people opt-in (56%). However, the rate varies by channel. The rate for

Table 1. — Opt-in rates by channel/residence

| Channel/residence | Opt-in Customers | Opt-out Customers | Opt-in Rate (pct) |
|----------------------|------------------|-------------------|-------------------|
| <u>1a: Channel</u> | | | |
| ReserveAmerica | 64,491 | 36,570 | 63.8 |
| ReserveUSA | 35,762 | 50,368 | 41.5 |
| No reservation | 62,332 | 29,539 | 67.8 |
| <u>1b: Residence</u> | | | |
| USA | 159,863 | 114,779 | 58.2 |
| Canada | 2,355 | 1,406 | 62.6 |
| Other foreign | 358 | 287 | 55.5 |
| Totals | 162,576 | 116,472 | 58.3 |

federal sites (R-USA) is lower (42%) than the other RA or non-reservation contacts (64% and 68%). Residence does not seem to be a problem: in fact, Canadian opt-in is the highest in the table (63%) and other foreign (56%) is comparable to the core USA rate (58%). (The other non-USA sources might be overseas military as well as foreign nationals.) What can be said is that the opt-in group's representativeness relative to the behavior of concern, camping reservations, is not well known. Those who called in but made no reservation at that time were the highest to opt-in. Why is not clear - perhaps they had no reason to expect further interaction, had not yet committed to a transaction/purchase, or had not yet given personal particulars like credit card numbers. The low R-USA opt-in (42%) is not expected and stands apart from the other results. Why this might be so is not clear and unfortunately we don't have enough information at hand to clarify this further. Perhaps these customers regard the R-USA site differently e.g., the internet site presents itself in a substantively different way that lowers compliance, or, alternatively, telephone customers across the two channels may respond differently to the opt-in request. The key is that the opt-in request is generally only moderately successful.

Table 2 presents data from the reservation sessions that were available. From the dates in the transaction registers the proposed length of stay and the type of site requested are known and can be compared against other available data. Table 2 shows two variables (length of stay and site type) by data two data sources: pilot survey (first column) and transaction subsample (last column).

Table 2. — Data sources by length of stay, site type and management agency

| Variable | Pilot Survey | | Opt-in | | Opt-out | | Subsample | |
|--------------------|--------------|------|--------|------|---------|------|-----------|------|
| | n | pct | n | pct | n | pct | n | pct |
| Length of stay | | | | | | | | |
| 1 night or less | 852 | 9 | 31 | 10.5 | 47 | 11.2 | 78 | 10.9 |
| 2 nights | 4,312 | 45.6 | 126 | 42.6 | 191 | 45.6 | 317 | 44.3 |
| 3 nights | 2,112 | 22.3 | 71 | 24.0 | 112 | 26.7 | 183 | 25.6 |
| 4 nights or longer | 2,184 | 23.1 | 68 | 23.0 | 69 | 16.5 | 137 | 19.2 |
| Total | 9,460 | 100 | 296 | 100 | 419 | 100 | 715 | 100 |
| Site type | | | | | | | | |
| Family | 9,255 | 97.8 | 282 | 95.3 | 412 | 98.3 | 694 | 97.1 |
| Group | 205 | 2.2 | 14 | 4.7 | 7 | 1.7 | 21 | 2.9 |
| Total | 9,460 | 100 | 296 | 100 | 419 | 100 | 715 | 100 |
| Agency | | | | | | | | |
| Corps of Engineers | 5,473 | 57.9 | 137 | 46.3 | 203 | 48.4 | 340 | 47.6 |
| Forest Service | 3,987 | 42.1 | 159 | 53.7 | 216 | 51.9 | 375 | 52.4 |
| Total | 9,460 | 100 | 296 | 100 | 419 | 100 | 715 | 100 |

Table 3. — Response rates for pilot survey by subpopulation

| Survey | Sent to Customers | Completes Received | Response Rate (pct) |
|-----------------------------------------|-------------------|--------------------|---------------------|
| Internet Customers | | | |
| Internet link after reservation session | 7,711 | 1,724 | 22.4 |
| Internet link post-trip | 15,627 | 3,828 | 24.5 |
| Phone Customers | | | |
| Phone after reservation session | 373* | 366 | 98.1 |
| Phone post-trip | 888* | 800 | 90.1 |
| E-mail after reservation session | 8,408 | 1,430 | 17.0 |
| E-mail post-trip | 11,772 | 2,032 | 17.3 |

* Estimated from CATI logs

The transaction subsample is further broken out in the middle two columns by opt-in and opt-out status. As above, the opt-in group in this table acts as a strong surrogate for the non-respondents to the pilot survey. Ideally, the data should be similar between the opt-in and pilot data. By inspection of the percentages in the table this is generally what we find. In fact, the length of stay variable does not vary much in absolute terms across these four groups. Statistically, the opt-in group is not different from the pilot survey group $X^2_{df=3} = 1.61$, $p = .656$). Site type data is relatively invariant as well, ranging from 95 to 98 percent choosing family sites. The 2.5 percent difference although small in real terms is, however, statistically significant between opt-in and pilot group $X^2_{df=1} = 8.59$, $p = .003$), with those reserving family sites more prevalent in the pilot survey. Thus, breaking out the data across these two variables tends to confirm the quality of the data in the pilot group. That is, based on admittedly limited data, there is evidence that the respondents in the pilot survey are similar to, and hence representative of, the larger group from which they were drawn. The last section of Table 2 presents the same four-

way breakout by managing agency. Here there is both a practical percentage difference and a statistical difference for the pilot to opt-in comparison $X^2_{df=1} = 15.724$, $p < .001$). The pilot survey CE respondents are 58 percent of the sample and FS are 42 percent, or exactly the opposite pattern from the opt-in group, which is 54 percent FS customers. This shift is not a major concern if the sampling list data is known. (It isn't here - the nonresponse pool size is unknown due to the way the surveys were sent out electronically.) In general, this sort of imperfection could easily be taken care of by more closely monitoring the sampling detail and using post-hoc case weighting if necessary. It is important to discern if the observed differences are due to a cognitive or behavioral difference in respondents, a difference in refusing to comply, or just due to a procedural difference in how the samples were drawn and administered.

Key Concern: Response rates and representativeness

The response rate data from the pilot survey (Table 3) is broken out by the six individual

questionnaires used, two each from the three main groups as explained in methods above: internet (website) reservations, phone center (800 number) callers contacted with a CATI survey, and phone center callers contacted via an email address they provided. Each of the three basic groups (internet, phone and email) was surveyed at two times as explained above. The response rates are consistent across all groups relative to the channel used. Internet and email customers respond at uniformly low rates (17% to 25%) whereas the phone customers' response rates are very high (90% and 98%). The low refusal rates on the phone surveys are quite encouraging and suggest no response bias concerns at all. The electronic survey forms are quite another matter. Although these rates are higher than those reported by others employing web-based or email surveys they are still low relative to the standards usually set for survey sampling (Schaefer & Dillman 1998). Note also that the rate observed here is after saying "yes" to a personal request to participate (they then supplied their email address), and that these response rates are after more than half of the R-USA subpopulation have opted-out (41.5% opted-in), thereby lowering the effective response rate further (to roughly 7% - 10% for the R-USA group).

However, there was no opportunity for multiple contacts or other follow up procedures that are often recommended for social surveys. Clearly, response bias is a concern here. A comparison within the phone channel customers is presented next (Table 4). Phone-CATI and phone-email respondents are compared across age, education, income and management agency.

Table 4.—Phone-CATI vs Phone-email Respondents

| Variable | CATI | | Email | |
|-------------------------|------|------|-------|------|
| | n | pct | n | pct |
| Age | | | | |
| Under 55 | 625 | 54.3 | 2,366 | 76.8 |
| 55 or over | 527 | 45.7 | 729 | 23.2 |
| Education | | | | |
| HS or less | 858 | 74.9 | 835 | 27.0 |
| College or more | 288 | 26.1 | 2,263 | 73.0 |
| Income | | | | |
| Under \$55,000 | 548 | 56.9 | 896 | 31.7 |
| Over \$55,000 | 415 | 43.1 | 1,927 | 68.3 |
| Agency | | | | |
| Army Corps of Engineers | 869 | 74.5 | 1,710 | 54.7 |
| Forest Service | 297 | 25.5 | 1,415 | 45.3 |

There are significant differences between these two groups that are at times striking. CATI respondents are older and hence are more likely to be retired (46% over 55 yrs), fewer have a college education (26% vs 73%), and concomitantly they earn less (43% vs 68% over \$55,000 per year). Finally, the CATI group is disproportionately found at CE sites (75% vs 55%). These results are consistent with recent studies of internet use (Census, 2001). Aside from the clear marketing implications, these data suggest that CATI surveys are important if not necessary to gauge the customer experiences of an important segment of the R-USA customers.

Conclusions

The opt-in processes that were used in the pilot program worked reasonably well. Although the opt-out rates were substantial (roughly 50%), the subsequent bias checks suggested no systematic bias relative to reservation or camping behaviors. However, the tests used here were quite limited and stronger, better-focused bias checks seem warranted, e.g., geographic or seasonal variation might occur and there may be differences based on experiential preferences. Second, the biggest concern for response bias is validated by the very low response rates for internet and email surveys. In terms of survey mode, these are one and the same, although the individual rates reflect a different subpopulation with slightly different means of contact and agreement to participate. The generally low rate for this mode of survey may be pernicious and difficult to solve because improving the response rates directly may not be possible if it is a common feature of electronic surveys. A suggested solution is to build in additional bias checks to counteract the fact that the available information is too sparse relative to the variables of interest (reservations and camping) to be definitive. Even though this adds to the overall work load, such bias checking improves the reliability and validity of the data and is thus a crucial task. Third, the phone channel response bias was especially distinctive socio-demographically (poor, older, etc.). Because of the implications for equity in service provision, these subpopulations will need to be monitored and if they cannot be adequately captured in web-based surveys, other means such as CATI surveys may continue to be useful. Finally, as noted above, the adequacy of the variables used for bias checks is only moderate- it

will be important to build in additional transaction data and membership information to assure the data is scientifically accurate.

Overall, the pilot surveys have been used to improve the NRRS customer service survey protocols, but some questions remain especially for walk-ups, phone only customers, and for the low internet response rates. Also, there seems to be a need to address and analyze opt-outs and non-respondents, especially for internet-based surveys.

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