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The Effects of "Preprinting" on Survey and Item Response Rates: A Research Note

Andrea Kelly, Gerrit Knaap, Alison Simon, and Sylvia Temperley
University of Illinois at Urbana-Champaign

Inventories of recreation facilities are often conducted using mail surveys, which typically have low response rates. One potential way to increase response rates is to "preprint" the survey form with all previously provided information. To explore this potential, we examined the effects of preprinting on survey form and item response rates. Results showed that preprinting indeed increases response rates but may lower item response rates. These results suggest that recreation facility administrators need to balance the benefits of higher survey response rates against costs of lower item response rates when deciding whether to preprint mail survey forms.

KEYWORDS: *SCORP, facility inventory, survey response, response burden*

Introduction

To be eligible for federal grant programs for the construction and maintenance of outdoor recreation facilities, the Land and Water Conservation Act of 1965 requires states to prepare a comprehensive outdoor recreation plan every five years. Current regulations for the State Comprehensive Outdoor Recreation Planning (SCORP) process call for "an evaluation of the demand for, and supply of, outdoor recreation resources and facilities in the state" (National Park Service, 1991). These plans provide a basis for recommending allocations of federal and state funds to local jurisdictions for the construction and operation of recreation facilities as well as the acquisition of land.

In preparing SCORPs, states have used several different approaches to address the concept of need or demand for facilities (Vance, 1986). One approach is to ask the public what is needed or what demand is currently unmet. The public, however, may not be able to identify unmet recreation facility needs and some groups with greatest need may not be heard. Outdoor recreation facilities are generally unpriced, or at least not priced in such a way that supply will respond to demand, so traditional supply and demand concepts cannot be usefully applied. Estimation of demand for specific recreation facilities based on travel cost surrogates is not practical at the required level of detail for the entire state.

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Given the difficulty of estimating the supply of and demand for recreation facilities using complex statistical methods, Hoffman and Westfall (1984) developed an approach to guide the allocation of funds on the basis of differences among service areas in existing supply per capita. In such an approach, differences in the supply of recreation facilities per capita are used to guide the allocation of recreation facility funds. This "*service-area based, equity approach*" tends to provide equality of recreation opportunities, rather than a response to current levels of participation or expressions of unmet demand. It is equity oriented rather than efficiency oriented. It also avoids the intractable problem of estimating recreation demand.

If estimates of facilities per capita by type take into account income differences and geographic differences, at least some of the possible misinterpretations from using norms of supply per capita can be avoided. In addition, fund allocations guided by SCORP plans typically respond to requests from local government units that must provide 50% matching funds. If there is no locally perceived demand for a particular facility, then the locality is unlikely to provide matching funds. The state can decline funds if the locality already has a supply per capita that is above the norm for that particular facility type. Such allocative decisions, however, require not simply a list of sites, but detailed information about the facilities available at those sites. If funding proposals request lighting for softball fields, for example, then decision makers need information about the relative supply of lighted softball fields within that service area.

The Hoffman and Westfall approach to recreation facility management, therefore, requires two sets of data: general data on local populations and detailed information on the existing supply of recreation facilities. States have used a variety of techniques to estimate facility supplies. These include phone interviews, mail surveys, and delegating the task to local governments (Minnesota Department of Natural Resources, 1989; Washington Interagency Committee for Outdoor Recreation, 1990; Indiana Department of Natural Resources, 1990). The most common approach, however, is the mail survey.

Mail surveys are well known for their low cost and low response rates. As a result there has been much research on how to increase response rates without increasing costs. For at least thirty years researchers have tried numerous techniques to increase response rates to mail surveys. Some have proven successful, but the results for most techniques are mixed. Response rates have been found to increase when the survey researcher uses first class postage on outgoing or return mailings, limits the length of the questionnaire, or offers monetary incentives (Duncan, 1979; Goyder, 1982; Heberlein & Baumgartner, 1978; Kanuk & Berenson, 1975; Linsky, 1975; Yammarino, Skinner, & Childers, 1991; Yu & Cooper, 1983). Personalization has also been found to boost response rates, but only if respondents' anonymity is not threatened (Duncan, 1979; Kanuk & Berenson, 1975; Linsky, 1975). Researchers have also found that salience to the respondent had a significant positive effect on response rates (Heberlein & Baumgartner, 1978). One technique shown to increase response rates consistently is repeat contact,

either in the form of pre-contact, or through follow-up mailings (Duncan, 1979; Fox, Crask, & Kim, 1988; Goyder, 1982; Heberlein & Baumgartner, 1978; Linsky, 1975; Yammarino et al., 1991). Based on these findings, standard mail-survey procedure now calls for sending out reminder cards or a second survey (Dillman, 1978; Sudman & Bradburn, 1974).

Although the results have been mixed, the research suggests that personalization and repeat contact can increase response rates. One way to capture the potential benefits of both personalization and repeat contact in longitudinal survey research, such as a recreational facility inventory, is to print on the survey instrument information previously provided by the survey respondent (hereafter referred to as "preprinting"). Such preprinting is not costly and can perhaps make the survey seem more personal, familiar, and less burdensome to complete and return. Unfortunately, there has been no research on whether preprinting in fact increases response rates.

Because recreational facilities are durable much of the information in a recreation inventory remains constant over time. In these circumstances, it is reasonable and perhaps more efficient to preprint the survey form and to ask the respondent simply to update the information. If respondents receive personalized information on a continuing basis, response rates should be higher. Surprisingly, no one has tested this strategy. This study examines how preprinting affects survey-form and survey-item response rates.

Method

The research was conducted as part of an effort to update the Illinois Recreation Facilities Inventory (IRFI). IRFI is a land-based, computerized inventory of public, private, and quasi-public recreation facilities in Illinois. The inventory, and thus the survey instrument used to establish and maintain the inventory, contains information on agencies that manage one or more recreation sites in Illinois and the number and types of facilities available at each site. The inventory was first prepared in 1986 under contract with the Illinois Department of Conservation (Burdge, Hopkins, & Orland, 1990). Under the Land and Conservation Act of 1965, states must inventory outdoor recreation facilities every 5 years to remain eligible for federal funds. To meet this requirement, the Department of Conservation in 1990 funded a project designed to update the database.

The present study tested two questions: a) Does preprinting affect the rate at which surveys are returned (survey response rates)? and b) does preprinting affect the rate at which respondents attend to questions on the survey (item response rates)?

To isolate the effects of preprinting on response rates, we modified the survey form used in 1986 only slightly. The four-page form asked detailed information on the full range of facilities provided at all outdoor recreation sites in Illinois. To ease respondent burden, each page was divided into six sections (except the last which had only five) and was marked with an appropriate icon. Each section addressed a single aspect of the recreation site,

such as "Campsites" or "Fishing Facilities," and each section contained from 6 to 37 questions. In 1990, we sent survey forms and accompanying cover letters to every management agency that responded to the 1986 inventory. We sent follow-up postcards one week after the original mailing.

In the 1986 sample, 1,332 management agencies provided information on 3,769 sites. From these 3,769 sites, we randomly selected 1,278 sites (approximately one-third) for which we did not preprint a survey form. For the other 2,491 sites, we printed all previously provided information on the survey form. Because the sites were randomly selected, an individual management agency may not have received a preprinted form for one or more of their previously reported sites. Regardless of the number of sites for which a management agency might not have received a preprinted form, however, each management agency was sent only one non-preprinted form, and asked to duplicate the form for any new sites or sites for which they did not receive a preprinted form. Only one non-preprinted from was sent to each management agency, so as not to "tip off" that known sites had been omitted.

To identify the effects of preprinting on item response rates, respondents were asked to complete each section of the survey. On non-preprinted survey forms, respondents were asked to report the number of facilities in each section, or to check a box at the head of the section to indicate that they had none of the facilities in that section. On the non-preprinted survey forms, for example, survey respondents were asked to report the number of winter sport facilities available by type or to place a checkmark in a box indicating that the site had no winter sport facilities. Similarly, on the preprinted survey forms, respondents were asked to correct any information in the section that was incorrect or had changed, or to place a checkmark in a box at the head of the section to indicate that all the information was accurate. By using these checkmark options at the beginning of each section, respondents were given an opportunity to respond to each section of the survey.

Using the checkmark strategy, we analyzed responses to one section from each of the last three pages of the survey (the first page contained questions that pertained to the management agency). To strengthen the power of the test, we focused our analysis on those sections from each page with the highest number of eligible respondents (that is, those sections in which the greatest number of agencies indicated they had facilities in the 1986 survey). For each of these sections, we coded a positive item response if new information was provided in the section, if the box was checked to indicate that the section was not applicable, or if a box was checked to indicate that the information provided had not changed. We coded a negative item response for those sections where the respondent provided neither new information nor checked a box. With this research design we were able to examine whether respondents tended to respond to particular sections of the survey more often on preprinted than on non-preprinted survey forms.

To examine the effects of preprinting on survey response rates, we identified those sites for which a survey was returned and those for which a survey

TABLE 1
Illustration of Response Rate Computation

Management Agency	Sites Reported in 1986	Preprinted Forms Sent in 1990	Preprinted Forms Returned	Non-Preprinted Forms Returned	Non-Preprinted Response Rate	Preprinted Response Rate
A	10	7	7	1	1/3	7/7
B	5	4	4	1	1/1	4/4
C	5	3	0	0	0/2	0/3
Total	**20**	**14**	**11**	**2**	**2/6**	**11/14**

was not returned. For those surveys that were returned we then examined the response to each of the three sections identified above. Because only one non-preprinted form was sent to each management agency, regardless of the number of sites for which a survey form was not preprinted, the non-preprinted survey-form "response rate" does not equal the number of forms returned divided by the number of forms sent. A site manager may, for example, have duplicated a single non-preprinted survey form to report facilities at one or more previously reported site or one or more new sites. Thus the non-preprinted survey-form response rate actually represents the number of sites reported on a non-preprinted survey form divided by the number of sites for which a preprinted survey form was not sent. The computation of response rates is illustrated in Table 1.

Survey form response rates are presented in Table 2. As shown, the response rate for the preprinted forms was 49.6%. The response rate for sites without a preprinted form was 35.4 percent. Using a likelihood ratio test (Freund, 1971, p. 320), we were able to reject the hypothesis that preprinting does not affect response rates at the 1 percent confidence level.

Item response rates are also reported in Table 1 for the Water Area, Toilets, and Winter Sports sections of the survey. In each section, over 93% of those that returned a non-preprinted form provided new information, indicated that the printed information was correct, or indicated that the

TABLE 2
Survey and Item Response Rates

Type of Form	Survey Form Response Rate	Item Response Rates		
		Water	Toilets	Winter Sports
Preprinted Forms	49.6	98.5	74.7	98.8
Non-preprinted Forms	33.5	98.8	99.3	93.3
t score	8.329*	.038	3.324*	.610

*$P < .001$

section was not applicable. The item response rates for preprinted forms were also high, but lower than non-preprinted forms for two out of the three sections. The response rates for the Toilets section were significantly lower for the non-preprinted than for the pre-printed forms. There is reason to believe that the Toilets section provides the most reliable test. The response rates for the other sections on both the non-preprinted and preprinted forms may have been high in part because the majority of respondents responded with a checkmark indicating no change or not applicable. As opposed to water and winter sport facilities, toilets were a facility provided by a majority of respondents.

Summary and Conclusions

The results of this study suggest that preprinting survey forms affects both survey and item response rates. Preprinting survey forms increases survey response rates. Based on the responses of recreation facility managers in Illinois, facility managers were 25% more likely to report on a site for which they received a preprinted form than a site for which they did not. However, preprinting also lowers item response rates. Facility managers in Illinois were significantly less likely to respond to at least one section of the preprinted form than the non-preprinted form.

These results have clear but contingent implications for measuring the supply of outdoor recreation facilities in particular, and for conducting longitudinal survey research in general. If the objective of the research is to maximize survey response rates without concern about item response, then preprinting is clearly preferable. Such might be the case, for example, if the researcher is conducting a census and cares more to know that the respondent exists than about the opinions or characteristics of the respondent. If the objective of the research is to obtain careful responses to survey items, with little concern for the survey response rate, then preprinting is probably less preferable. Such might be the case, for example, if the researcher is concerned with changes in population characteristics or opinions and has a large population from which to sample. If the objective is to maximize both the survey and item response rate, then the decision to preprint must be based on the relative importance to the researcher of having surveys returned and having responses to items on the survey.

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