

## THE EFFECT OF MOTIVATIONAL MESSAGING ON MODE CHOICE AND RESPONSE RATES IN THE LIBRARY MEDIA CENTER SURVEY

Elizabeth Nichols, Kent Marquis, Richard Hoffman III  
Elizabeth Nichols, U.S. Census Bureau, Washington D.C. 20233

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### I PROJECT OVERVIEW

A split panel study was conducted during the 1999-2000 Library Media Center (LMC) Survey to determine if highlighting the benefits of Web reporting would encourage more respondents to choose that mode. Half the sample received a paper form and motivational messaging, encouraging respondents to use the Web, in an insert and nonresponse telephone follow-up calls. The other half also received a paper form, but did not receive any motivational messaging; instead they received instructions which provided factual information about accessing the Web option. There was no mention of the Web option during this panel's nonresponse telephone follow-up calls.

The LMC population was a good fit for highlighting Web reporting benefits. They had high Web coverage and respondents were typically Web savvy. The 1997-98 LMC field test (Tedesco et al. 1999) also offered a paper or Web mode choice. Very few respondents used the Web mode, which we attribute primarily to the strict security requirements which were not repeated during 1999-2000. Additionally the population might not have seen benefits of Web reporting.

### II LITERATURE REVIEW

Motivational messaging has been tried in other questionnaire studies, but these studies have either had slightly different goals or populations. Moore (1986) and Dillman et al. (1994a) found mixed results when testing the effect of motivational flyers on overall response rates. Moore (1986) found significant increased mail response rates in the panel that received a flyer highlighting reasons to respond to the 1986 census test. Dillman et al. (1994a) found that the benefits message neither increased nor decreased the completion rates to the 1993 National Census Test. Another study by Dillman et al. (1994b) offered respondents a telephone mode in addition to the mailback paper mode in hopes of higher overall completion rates. The delivery of the invitation to respond via telephone was varied across five panels. Except for one panel which included a follow-up letter without a replacement questionnaire, completion rates weren't improved. Other Web mode studies (Kwak and Radler, 2000; Couper et al. 1999) typically examine response rate differences between panels, when the

panels only offer one mode (Web or paper). Typically these studies find that a traditional mail mode receives higher response than the Web mode.

### III DESIGN

#### LMC Survey

The LMC population is public and private, elementary and secondary schools in the United States. The LMC is a voluntary survey collecting detailed information about the school's library media center. The typical respondent is the school's librarian. There were two Internet versions of the LMC questionnaire offered, one tailored for public schools and the other for private schools. Each had approximately 40 questions.

#### Experimental Design

For the 1999-00 LMC survey, public and private schools were assigned to one of two panels. Within the public/private school stratification, panel assignment was made randomly.

During mailout all schools received the appropriate paper questionnaire, cover letter, and a postage-paid return envelope. Schools assigned to the control panel received a questionnaire where the third page provided information on the Web response option and accessing instructions. This was also used during the 1998-99 LMC field test. Schools assigned to the treatment panel received a questionnaire where the third page was replaced with a page describing benefits of using the Web in addition to the access information. This same information was also on an insert. The benefit text emphasized speed of response, ease of response (just scroll and click), convenience (easy to print and send data) and taxpayer cost savings.

After the first mailout, a reminder postcard was sent. An extra sentence was added to the treatment panel's postcard: "To respond on the Internet for the Library Media Center Questionnaire, go to <http://...>". After the postcard, a second mailout occurred. The insert was again included in the treatment panel package.

The content of the nonresponse follow-up telephone calls also differed between the two panels. Treatment panel schools were encouraged to use the Web during nonresponse follow-up telephone calls. The schools in the control panel were not.

### Implementation Schedule

Initial mailout occurred between September 15-21, 1999. A second mailing was done on November 5, 1999. Telephone follow-up began on November 16, 1999. The Web option was disabled after June 9, 2000. Respondents could continue to send paper responses until June 21, 2000.

### LMC Web Questionnaire Design

The 1999-00 LMC Web questionnaires used an HTML scroll navigation design and had edits which were activated within the questionnaire using JavaScript programming code. The instrument required a Netscape or Internet Explorer version 3.0 or higher browser, with 40 to 128-bit encryption. The Web site also used a global server certificate for authentication.

### Scope of the Population Analyzed

Although 13,446 schools were mailed a LMC package, data from 11,471 schools is analyzed. Out-of-scope schools included those which had no grades 1-12, or were duplicates, or were not part of the defined sample universe, or were not a school or no longer operating, or did not have a library. Furthermore, we omitted five schools which did not provide data on the number of students enrolled.

### Analytical Techniques

Using SAS we performed several chi-square tests of independence and logistic regressions to determine what variables predict whether a respondent will (1) return a Web questionnaire vs. not return a Web questionnaire and (2) return any LMC questionnaire (paper or Web) vs. no return. The main predictor was our control/treatment panel assignment. In review, our split panel was designed to investigate whether the treatment (motivation in the insert and telephone follow-up calls) encouraged schools to use the Web to respond. In our analysis we assigned panel the following values (treatment=1 and control=0.) The logistic regression results are found in Tables 1-4.

Additionally, several other school characteristics were used as predictors. Each school was classified by type of school (public=1 and private=0). We divided the schools into four relatively equal sized groups of total enrolled students, (1-246)=1; (247-468)=2; (469-775)=3; and (776-5015)=4. The grade range of school was available as a categorical variable. Values included PK, K, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11,12 and many combinations of those values. We collapsed this variable into more meaningful groups based on our judgement. Schools with a value of PK-5, or any combination within that range, were assigned to the 'Elementary' category. Schools with a value of 6-8, or any combination within that range, were assigned to the

'Jr. High' category. Schools with a value of 9-12, or any combination within that range, were assigned to the 'High School' category. Schools with values that crossed one or more of the previous groups were assigned to the 'All grades' category. Over 200 schools had values which were meaningless. We assigned those groups into an 'Unknown' category. For the logistic regressions we omitted the elementary category since there were far more elementary schools and we hypothesized that the elementary schools might have fewer technological advances as compared to schools with secondary grades. Each category was recoded further into dummy variables (Jr. High=1, otherwise=0; High School=1, otherwise=0; All grades=1, otherwise=0; and Unknown=1, otherwise=0.) This allows each of these groups to be compared to the omitted category of elementary.

## **IV RESULTS**

The motivational messaging treatment achieved its goal of getting more respondents to respond using the Web questionnaire, but at a high price of needing many extra nonresponse telephone follow-up calls. Approximately 21% of the treatment panel responded via the Web compared with 9% of the control panel. The final response rate in both groups was 86%. The treatment did not interact with other school characteristics to determine either final Web use rates or final response rates. For initial response rates, the treatment (the motivational insert) had a dampening effect on the overall response rate in the treatment panel. Additionally, high schools (vs. elementary school) interacted with the motivational insert to suppress their initial rate even more. The motivational insert did produce significantly higher initial Web use rates, but the size of the effect was small and not of practical value.

### Final Web-use Rates

Motivational messaging (insert and telephone follow-up calls) met its original goal, that being to encourage Web reporting. As shown in Figure 1, those schools receiving the motivational messaging used the Web (21.4%) more often than those in the control panel (9.3%). The logistic regression model in Table 1 shows that public schools are more likely than private schools to submit on the Web. Larger schools are more likely than smaller schools to submit on the Web. High schools, jr. high schools, and schools with all grades are each more likely to submit on the Web than elementary schools. Even controlling for all of these factors, schools receiving the motivational insert and follow-up calls were 2.7 times as likely to report using the Web as schools in the control panel. Another logistic regression model (not shown) indicated no significant interactions between the motivational treatment and school

characteristics. This implies that motivational messaging had the same impact on final Web reporting regardless of school type (public or private), size, or grade levels.

#### Initial Web-use Rates

Less than 1% of the schools reported via the Web before the telephone follow-up started. Analyzing the initial rate of Web use prior to the telephone follow-up calls, we conclude that the motivational insert by itself encouraged a few more schools (.95%) to use the Web as compared to the instructions in the control panel (.33%). Even though the initial Web rates are statistically significant, the fact that less than 1% of the treatment panel used the Web initially is not practically significant. The graphs in Figure 2 suggests that it was the telephone follow-up calls which had the greatest impact on the quantity of Web responses.

Even so, many of the same Web reporting trends exist in this early stage. The logistic regression model in Table 2 shows that public schools were more likely than private schools to submit on the Web initially. High schools were more likely than elementary schools to submit on the Web initially. Curiously, smaller schools were more likely to submit than larger schools initially on the Web. (We see in Table 4 that smaller schools were more likely to respond earlier than larger schools.) Even controlling for all of these factors, schools receiving the motivational insert were more likely to report initially using the Web than those schools in the control panel. Results from another logistic regression model (not shown) did not show any interaction between the motivational insert and school characteristics.

#### Initial and Final Response Rates

There was no motivational treatment effect on final response rates. Figure 3 shows that the final response rate in each of the panels was 86%. The surprising finding in this study is that the treatment actually suppressed response rates in the initial part of the field period, prior to the telephone calls made to the nonresponding cases. The initial response rate for the treatment panel was 36% compared to a 45% response rate for the control group.

The logistic regression in Table 3 indicates no panel, type of school (public vs private) or school size effect on the final response rates. High schools had a higher response than elementary schools. Another logistic regression (not shown) determined there was no treatment interaction with other school characteristic on the final response rate, but the motivational insert did interact with high schools to suppress their initial response rate (Table 4).

## **V DISCUSSION**

The motivational messaging tested during the 1999-2000 LMC had mixed results. On one hand, the combination of the motivational messaging in the insert and telephone follow-up phone calls met its original purpose in encouraging significantly more respondents to choose the Web for reporting. We also conclude that the insert itself encouraged respondents to choose the Web to a very small extent, prior to the follow-up calls. Unfortunately, the motivational insert appeared to have a large negative effect on the initial response rate prior to the telephone follow-up calls. Once the telephone calls were completed, there was no difference in the overall response rate by panel. We are not sure what would have happened if there were no follow-up calls. Perhaps the same response rate trend would have continued, or perhaps the treatment panel response rate would have rebounded. In any event, we see the importance of the telephone follow-up calls. Our goal however is not to rely on telephone calls to maintain response rates. We'd like to minimize the use of telephone calls which suggests not using the motivational insert as we designed it.

We cannot tell definitively from the available data why the motivational insert had this negative impact on initial response rates. Obviously, the school libraries in the treatment panel were not opposed to responding any more than those in the control panel, since they did so after the follow-up calls. They also didn't differ significantly in characteristics from those in the control panel. Our hypothesis for the low initial response in the treatment panel is that the motivational insert worked to the degree it got potential respondents interested in trying the Web instrument (thus they didn't complete the paper form), but didn't work in actually moving them onto the Web and completing the electronic form in a timely fashion. This hypothesis helps explain the negative interaction between the insert and the initial response rate for high schools. Ultimately, high schools were more likely to use the Web than elementary schools, so they were the schools that upon receiving the insert, were interested in Web reporting, but ultimately couldn't meet the first follow-up deadline. The experiment doesn't offer the reason for failure to meet the reporting deadline. Targeting the transition from interest to action is what we need to focus on for future tests.

This experiment adds to the motivational messaging and mixed mode literature. The mixed set of conclusions drawn from it are in keeping with the mixed messages from those past experiments, even though those experiments had different populations and different goals. Like the Moore (1986) experiment, the LMC motivational messaging worked. It influenced

respondent actions. However, like the Dillman et al. (1994b) telephone mixed mode experiment, the addition of a Web mode didn't appear to increase the overall response rates regardless of the invitation. The addition of another response option did not draw in more respondents. We suspect, respondents simply shifted from one mode to another. Of course, it could be the case that the Web responders would have been nonrespondents without the Web option.

In the case of the LMC, the addition of the Web response option was not designed to solve any particular response problem. Instead the Web mode was offered because of a Commerce Department's mandate for converting paper processes to the Web, because the LMC population was suited to Web reporting, and because we strongly felt LMC respondents might find it less burdensome than a paper questionnaire. If a Web option is offered, it is to the survey organization's advantage to encourage respondents to use it. Eliminating back-end keying and higher quality data due to built-in edits are two advantages. These should not come at the expense of the overall response rate or some other unforeseen problem.

This leads us to the final set of conclusions. Like the Kwak and Radler (2000) and Couper et al. (1999) findings, even when the population appears to be a good match for Web reporting, paper still appears to be the predominant mode choice when the initial contact is by mail and includes a paper questionnaire. Perhaps if we had sent the questionnaire by email initially, the preferred mode might have been the Web.

We do find a subset of the LMC population that is more likely to report using the Web. Schools who were larger, secondary, and public tended to report using the Web at a higher rate than their counterparts. However, even when respondents are interested in reporting using the Web, there is a lag between that interest and the action, so much so that response rates are affected. This was highlighted in the interaction between high schools and the insert. High schools were more likely to use the Web ultimately, but only after a much lower than expected initial response in the treatment panel.

There are additional steps which are not present in the paper mode. To start the Web version, the respondent must log onto the computer, onto the Internet, find the site and log onto it. Thus there are four more tasks a user must do than with a paper mode. These steps will be eliminated if, for example, the questionnaire arrives by email and can be filled out on-the-spot. On the other hand, there are probably more steps to submitting the completed paper form than a completed Web form. The challenge for researchers is to understand the constraints

on respondents, and redesign the entire set of response tasks to minimize them.

Note: This paper reports the results of research and analysis undertaken by Census Bureau staff. It has undergone a Census Bureau review more limited in scope than that given to official Census Bureau publications. This report is released to inform interested parties of ongoing research and to encourage discussion of work in progress. The authors thank Steve Tourkin, Nancy Bates, and Jeff Moore for their review. While working at the U.S. Census Bureau, Richard Hoffman was the project leader for this experiment. He has since taken a position with IBM.

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Table 1: Adjusted Odds Ratios of a Logistic Regression Model Predicting Likelihood of Returning a Web Questionnaire

<u>Independent Variable</u>	<u>Adjusted Odds Ratio</u>
Treatment panel*	2.719
Public vs Private school*	1.331
Number of students*	1.100
Grade range of school	
Jr. High*	1.378
High School*	1.981
All grades*	1.523
Unknown	1.008
Elementary	...

N=11,477; \*p<.10

Table 2: Adjusted Odds Ratios of a Logistic Regression Model Predicting Likelihood of Returning a Web Questionnaire Before Followup Started

<u>Independent Variable</u>	<u>Adjusted Odds Ratio</u>
Treatment panel*	2.886
Public vs Private school*	3.040
Number of students*	0.799
Grade range of school	
Jr. High	1.463
High School*	1.664
All grades	1.293
Unknown	0.865
Elementary	...

N=11,477; \*p<.10

Table 3: Adjusted Odds Ratios of a Logistic Regression Model Predicting Likelihood of Returning Any Questionnaire (Paper or Web)

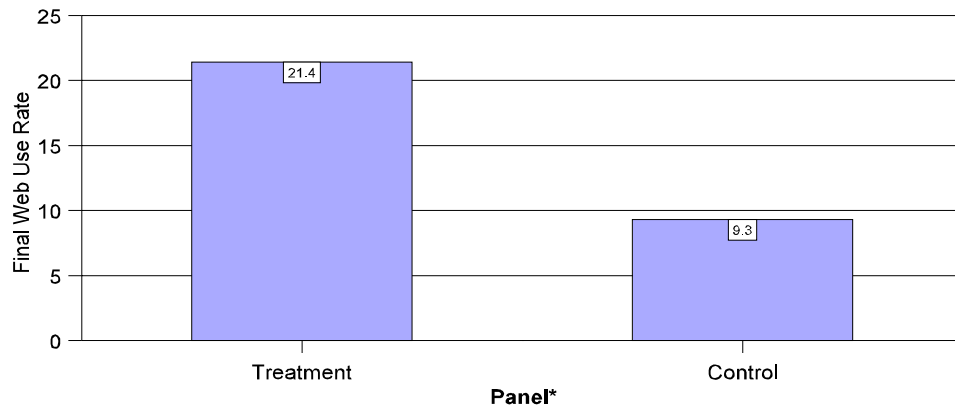
<u>Independent Variable</u>	<u>Adjusted Odds Ratio</u>
Treatment panel	1.016
Public vs Private school	1.099
Number of students	1.040
Grade range of school	
Jr. High	0.983
High School*	1.199
All grades*	0.782
Unknown*	0.543
Elementary	...

N= 11,477; \*p<.10

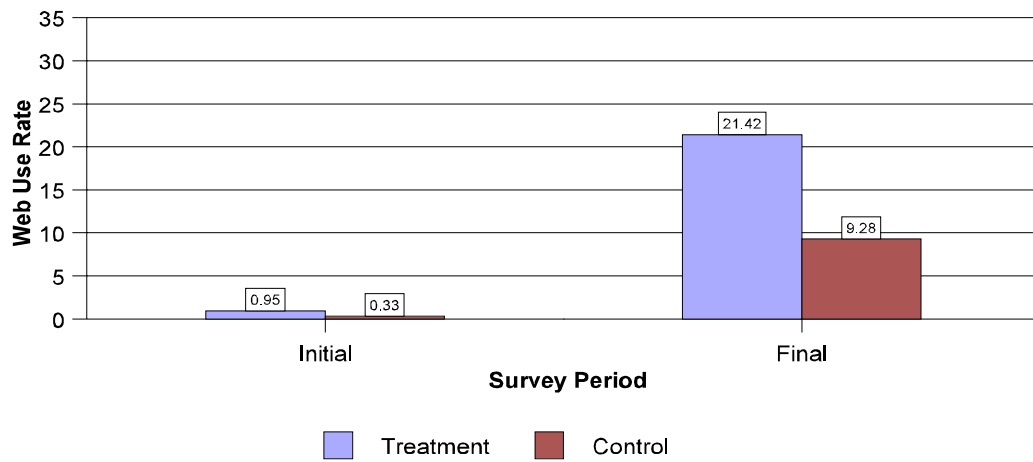
Table 4: Adjusted Odds Ratios of a Logistic Regression Model Predicting Likelihood of Returning Any Questionnaire (Paper or Web) Before Followup Started

<u>Independent Variable</u>	<u>Adjusted Odds Ratio</u>
Treatment panel*	0.7153
Public vs Private school	1.0154
Number of students*	0.8957
Grade range of school	
Jr. High	0.9685
High School*	1.3386
All grades*	0.8078
Unknown*	0.5132
Elementary	...
Treatment x Public school	0.8625
Treatment x Number of students	1.0622
Panel x Grade range of school	
Trmt x Jr. High	1.1228
Trmt x High School*	0.7068
Trmt x All grades	0.8264
Trmt x Unknown	1.0783
Trmt x Elementary	...

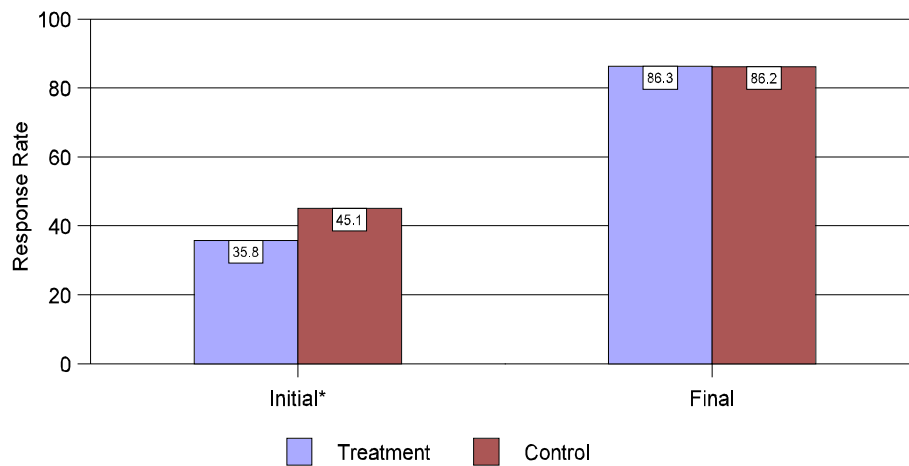
N= 11,477; \*p<.10



**Figure 1:** Final Web Use Rate by Panel  
 Chi-Square=325.2, (\*p<.01) (treatment=5,774 cases; control=5,703 cases)



**Figure 2:** Web Use Rate by Panel by Survey Period  
 (treatment=5,774 cases; control=5,703 cases)



**Figure 3:** Response Rates by Panel by Survey Period  
 Initial Chi-Square=103.5 (\*p<.01), Final Chi-Square=0.056, (treatment=5,774 cases; control=5,703 cases)