THE INFLUENCE OF MOTIVATIONAL APPEALS ON MAILBACK RESPONSE

James B. Treat, U. S. Bureau of the Census*
U. S. Bureau of the Census, DSSD, Room 3770-3, Washington, DC 20233-0001

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1. INTRODUCTION

A decline in mailback response in the Decennial Census from 75 percent in 1980 to 65 percent in 1990, has prompted research on ways to improve mail response in the 2000 Census. The Bureau of the Census has conducted tests designed to identify ways of improving census mailback response. This paper documents results of the motivational appeals component of the 1993 Census Test: the Appeals and Long-Form Experiment (ALFE). The ALFE was the fourth in a series of four census tests. Two types of motivational appeals were tested. One appeal was based on communicating to recipients the "benefits" of responding, the other was a "mandatory" statement informing the recipient that responding was required by law. In addition, the effect of two different confidentiality messages were tested, one a standard message and the other an "emphasized" or strong message.

The response effects of these motivational appeals messages and confidentiality statements were tested as potential contributors to mailback response beyond the survey procedures already found effective in previous census experiments. The survey procedures found to be effective are a prenotice letter, a respondent-friendly questionnaire, a reminder postcard, and a replacement questionnaire mailed to housing units which did not return the initial questionnaires. The ALFE was designed to evaluate the influence of the "benefits" and "mandatory" appeals and varying the emphasis of the data confidentiality upon mailback response and data quality. It was hypothesized that motivational appeals messages and confidentiality statements would add an increment to the 68-69 percent response that has been achieved through the use of the procedures described. Treatments were designed to compare effects on response resulting from alternative motivational appeals and varying the emphasis on the data confidentiality statement. Mailback response is measured by "completion rate" in the paper.

2. METHODOLOGY

Early in 1993, the Census Bureau proposed a test designed to increase mail response. The test built upon the results from three previous census tests: the Simplified Questionnaire Test (SQT), the Implementation Test (IT), and the Mail and Telephone Mode Test (MTMT). This test was called the Appeals and Long-Form Experiment (ALFE). The ALFE used respondent-friendly questionnaire construction, a prenotice letter, a reminder postcard, and a replacement questionnaire. The selection of the experimental variables for the ALFE took into consideration past mail survey research. The ALFE included two motivational appeals messages and two statements of data confidentiality. One of these appeals emphasized that response to the census was required by law: the mandatory appeal. A second emphasized the benefits to respondents and their community of responding to the census in a timely fashion: the benefits appeal. The final variable was a statement of confidentiality that differed in several respects from the Census Bureau's standard confidentiality statement.

The benefit motivational message consisted of the following statement on the questionnaire envelope: "U.S. Census Form Enclosed, IT PAYS TO BE COUNTED IN THE U.S. CENSUS" and a benefits statement placed on an insert. The mandatory motivational message consisted of the following statement on the questionnaire envelope: "U.S Census Form Enclosed, YOUR RESPONSE IS REQUIRED BY LAW" and a mandatory statement placed on an insert. In addition, two types of confidentiality statements tested: strong and standard. A section on the insert containing the strong confidentiality statement was titled "A Personal Message about Confidentiality from the Director". This section was signed by Harry Scarr, Acting Director of the Census Bureau. The message was highlighted on the page by being printed in a pale blue background. The standard confidentiality statement message was also printed on the insert. This statement was **not** a personalized message from the director, it was **not** signed, and it was **not** highlighted on the page. The two types of confidentiality statements were combined with the two motivational statements.

The ALFE utilized six treatments: five treatment groups and a control treatment. All treatment groups received the full implementation strategy: a prenotice letter, a respondent-friendly questionnaire, a reminder postcard, and a replacement questionnaire. The questionnaires (both the initial and the replacement) contained a message explaining the benefits of

responding along with a statement concerning confidentiality. The treatments are described below:

1. Control. A respondent-friendly booklet short-form questionnaire. This treatment did not receive the insert.

2. Benefits/Strong. Households received the benefits motivational message emphasizing the important uses of census data along with a strong confidentiality statement which was more detailed and emphatic. The benefits statement was placed on the questionnaire envelope and on the flap of the insert. The strong confidentiality statement was placed on the inside of the insert. The inside of the insert also contained other reasons for responding to the census, including the statement that response was mandatory.

3. Benefits/Standard. Households received the benefits motivational message emphasizing the important uses of census data along with the standard confidentiality statement. The benefits statement was on the questionnaire envelope and on the flap of the insert. The standard confidentiality statement was placed on the inside of the insert. The inside of the insert also contained other reasons for responding to the census, including the statement that response was mandatory.

4. Mandatory/Strong. Households received the mandatory motivational message emphasizing the legal requirements for completing and returning the form along with a strong confidentiality statement which was more detailed and emphatic. The mandatory statement was placed on the questionnaire envelope and on the flap of the insert. The strong confidentiality statement was placed on the inside of the insert. The inside of the insert also contained other reasons for responding to the census, including the statement explaining the benefits.

5. Mandatory/Standard. Households received the mandatory motivational message emphasizing the legal requirements for completing and returning the form along with a standard confidentiality statement. The mandatory statement was placed on the questionnaire envelope and on the flap of the insert. The standard confidentiality statement was placed on the inside of the insert. The inside of the insert also contained other reasons for responding to the census, including the statement explaining the benefits.

6. Mandatory, No Insert. Households received the mandatory motivational statement on the questionnaire envelope only. This treatment did not receive the insert.

The respondent-friendly booklet questionnaire tested in the Simplified Questionnaire Test was used for the six treatments. The questionnaire contained the content from the 1990 Census short form, i.e., seven individual questions for each household member plus eight housing questions.

Mailout/mailback survey methodology was used to collect the data. Within a 9 day period, each housing unit in sample received three items: the prenotice letter, the initial questionnaire, and the reminder card. The prenotice letters were mailed on July 9, 1993 to all housing units in sample alerting the residents that a questionnaire would be arriving in the next few days and requesting their cooperation. The initial questionnaires were mailed on July 12, 1993 followed by a reminder card on July 15, 1993. About 3 weeks after the initial questionnaire mailing, on August 5, 1993, all nonrespondents, including housing units where the questionnaire was returned by the United States Postal Service as an undeliverable, were mailed a replacement questionnaire. The questionnaire check-in operation was completed on September 1, 1993.

For this test, a case was considered a postmaster return if both the initial and replacement questionnaires were returned by the United States Postal Service as a undeliverable.

The universe for this test consisted of all housing units in mailback areas. Housing units included in the 1990 Post-Enumeration Survey and in the 1990 Research and Experimental samples were excluded from the ALFE universe. In addition, housing units for which it was unlikely the United States Postal Service delivered mail were also excluded, i.e., general delivery type and incomplete addresses. Finally, any unit selected for a previous census test was excluded from the universe. The universe contained approximately 88.8 million housing units.

The 449 district office areas for the 1990 Census were selected as the geographic units for defining the strata for the test. Two strata were defined. There was a high correlation between the minority rate (minority was defined as including all black and Hispanic classifications) and the 1990 Census mail response rate. Therefore, the stratification objectives were met by ranking the district offices by their percent minority. The FASTCLUS procedure in the SAS package was used to divide the ranked file optimally into two strata. The procedure finds a dividing line which minimizes the variability of the characteristic (in this case the minority rate) in each of the final two selected strata.

The first stratum consisted of 67 district offices with a high minority population. This stratum was called the "low response areas" stratum (LRA). The 67 district offices had a combined minority population (black and/or Hispanic origin) of about 64 percent and encompasses about 11 percent of all housing units in the universe. The second stratum represented the "high response areas" (HRA). This stratum consisted of 382

district offices with a combined minority population of about 15 percent and encompassed about 89 percent of all housing units in the universe.

A sample of 30,000 housing units of the 88.8 million housing units was selected with 15,000 units in each stratum. In each stratum, the 15,000 units were divided into six equally sized treatments. The sample units were placed into clusters of six housing units in order to reduce the sampling variance in the treatment-to-treatment comparison. A systematic sample of 2,500 clusters of six housing units were selected. Each housing unit in a cluster was randomly allocated to a treatment.

The sample was designed to obtain statistically reliable results on differences within strata between the treatment response rates. The sample size and design anticipated that, on average, there would be a 35 percent response rate to the initial questionnaire mailing and that the second mailing would yield an increase in the response rate of 15 percentage points. Specifically, the sample size selected (30,000 units, 15,000 per stratum) was deemed sufficient for detecting a minimum of a 3.0 percent difference at the national level at the 0.10 level of significance.

The national completion rate estimates for a given treatment as presented in this paper are computed by dividing the weighted total of the number of questionnaires returned by the weighted total number of forms mailed out less postmaster returns. For the stratum level, the estimates are obtained without the weights.

The completion rates were calculated for each of the treatments within stratum and at the national level (strata 1 and 2 combined). Standard errors for the national estimates are computed using the Stratified Jackknife variance procedures (Wolter, 1985). The estimates were produced by the VPLX statistical software procedure. Standard errors for the within stratum estimates were computed using the formula for the simple random sampling jackknife variance procedures.

The ALFE evaluation entailed a series of pairwise comparisons of the difference between completion rates for six treatments, both at the national level and for the two strata. When making these comparisons, common statistical practice requires that the procedure be done in such a way as to control for error in the decision process because only a sample of the population has been observed. For example, when we say that there is a significant difference between the completion rates for two treatments, we are able to say we are at least 90 percent (which is a Census Bureau standard) confident there is a real difference in the population, not just a difference due to sampling.

Due to the various hypotheses being tested, all possible pairwise comparisons between the six treatments (15 total) can be analyzed in the experiment. The more comparisons that are made, the greater the potential that some of these comparisons will be declared significant when they are not. In this case additional statistical measures are employed to control the overall error of the decision process.

The analysis has been carried out so that statements about the entire "family" of 15 pairwise comparisons by stratum and at the national level are made while maintaining the 90 percent confidence level simultaneously for all comparisons. While this procedure requires that larger differences exist between treatments to be declared significant, we are able to control the familywise error rate in the decision process. When several differences between any two treatments are declared significant, we are at least 90 percent confident that all such decisions are correct, simultaneously. All 90 percent confidence intervals were adjusted using the procedure in Hochberg and Tamhane (1987) for comparing pairwise contrasts of the test treatment estimates for a balanced equicorrelated design. Woltman (1993) discusses the use of the procedure in the response rate experiment program. With six test treatments, a multiplier of 2.59 was applied.

3. LIMITATIONS

The results from the evaluation are limited by the sample design, the survey environment and the design of the treatment groups. As a result, the actual numerical values from the study should not be directly equated or compared to what resulted or what might have happened in the 1990 Census. In addition, we cannot determine if these results are higher or lower than the census results. Rather, they reflect a pattern of response which should indicate whether or not a benefits or mandatory motivational message should be considered and whether or not the strong confidentiality statement should be considered for the 2000 Decennial Census.

The sampling frame of this study does not represent all mailback units as defined prior to the enumeration of the 1990 Census or a similar census mailback universe. The ALFE universe excluded addresses which were undeliverable in the census, or were part of the 1990 Research and Experimental samples with current "deliverable" status and response characteristics unknown. The completion rates resulting from this study might differ in value had these addresses been included in the sampling frame.

The ALFE completion rates are not directly

comparable to census mail response rates or census mail return rates.

4. FINDINGS

4.1 Completion Rates

The overall completion rates and standard errors for each of the treatments at the national and stratum levels are presented in Table 1. For the treatments with the mandatory motivational message (4, 5, and 6), the completion rates at the national level were between 76.4 percent and 78.1 percent. At the HRA level, treatment 5 had a completion rate of 80.5 percent. Similarly, treatments 4 and 6 HRA completion rates were 79.3 percent and 78.5 percent, respectively.

4.2 The Effect of the Confidentiality Statement

In Table 2, the comparisons indicate the effect of the confidentiality statement on the insert; standard and strong. Two comparisons are made. The first comparison is treatment 3 (standard) with treatment 2 (strong). Both treatments received the benefits motivational message. The second comparison is treatment 5 (standard) with treatment 4 (strong). Both treatments received the mandatory motivational message. For both comparisons the difference is not statistically significant at the national, the HRA, and the LRA levels. Therefore, there is no evidence of a difference between the standard confidentiality statement and the strong confidentiality statement when either statements are placed on the insert.

4.3 The Effect of the Benefits Motivational Message

In Table 3, the comparisons indicate the effect of the benefits motivational message with the standard and/or strong confidentiality statement on the insert. All the comparisons in Table 3 are to the control treatment. The first comparison (2 - 1) evaluates the effect on the completion rate of the benefits appeal with the strong confidentiality statement. The second comparison (3 - 1) evaluates the effect on the completion rate of the benefits appeal with the standard confidentiality statement. At the national, the HRA, and the LRA levels the benefits appeal with the strong and standard confidentiality statement is not statistically significant. Since there is no difference between the standard confidentiality statement and the strong confidentiality statement when either statements are placed on the insert we combined the two treatment (2 and 3). Therefore, the last comparison [(2&3) - 1] evaluates the effect on the completion rate of the benefits appeal with either the standard or strong confidentiality statement. Similarly with the two previous comparisons, at the national, the HRA, and the LRA levels the benefits appeal with the strong and standard confidentiality statement is not statistically significant.

4.4 The Effect of the Mandatory Motivational Message

In Table 4, all the comparisons are with the control treatment. The first three comparisons indicate the effect of the mandatory motivational message with the standard and/or strong confidentiality statement on the insert. The first comparison (4 - 1) evaluates the effect on the completion rate of the mandatory appeal with the strong confidentiality statement. The second comparison (5 - 1) evaluates the effect on the completion rate of the mandatory appeal with the standard confidentiality statement. The third comparison is the combination of treatments 4 and 5 with treatment 1 [(4&5) - 1]. Treatments 4 and 5 are combined since there is no difference between the standard confidentiality statement and the strong confidentiality statement when either statements are placed on the insert. For all three comparisons at the national, the HRA, and the LRA levels the mandatory appeal with the strong and/or standard confidentiality statement are statistically significant. At the national level the estimated difference was 10.3 percent (4&5 - 1).

The last comparison (6 - 1) indicates the effect of the mandatory motivational message without the insert. At the national, the HRA, and the LRA levels the mandatory appeal without the insert is statistically significant. At the national, the HRA, and the LRA levels the estimated difference is 9.1 percent, 9.2 percent, and 8.4 percent, respectively.

4.5 The Effect of the Mandatory Insert

Table 5 contains the comparisons which indicate the effect of the mandatory motivational message without the insert. The first comparison (4 - 6) is between the mandatory appeal with the strong confidentiality statement on the insert and the mandatory appeal without the insert. The second comparison (5 - 6) is between the mandatory appeal with the standard confidentiality statement on the insert and the mandatory appeal without the insert. The third comparison is the combination of treatments 4 and 5 with treatment 6 [(4&5) - 6]. Treatments 4 and 5 are combined since there is no difference between the standard confidentiality statement and the strong confidentiality statement when either statements are placed on the insert. For the three comparisons, the

difference is not statistically significant at the national, the HRA, and the LRA levels.

5. CONCLUSION

The main finding from this study is that the mandatory motivational appeal with a strong and/or standard confidentiality statement dramatically improves response. The utilization of "YOUR RESPONSE IS REQUIRED BY LAW" message improves the completion rate dramatically overall from 9.1 to 10.9 percentage points. Completion rates were 76.4 to 78.1 percent overall compared to 67.2 percent for the control. The completion rates ranged from 78.5 to 80.5 percent in the high response areas stratum and 59.7 to 60.7 percent in the low response areas stratum. These completion rates are by far the highest obtained in any of the short-form tests the Census Bureau has conducted in a noncensus year. In addition, the same results can be achieved by only implementing the envelope portion (no insert) of the mandatory appeal. The cost of implementing the envelope portion of the mandatory motivational appeal is negligible, since it involves printing the statement "YOUR RESPONSE IS REQUIRED BY LAW" on the envelope.

In contrast to the mandatory findings, the benefits message had little impact. Completion rates were not significantly higher than the control treatment, ranging from 68.4 to 69.1 percent overall compared to a completion rate of 67.2 percent for the control. Therefore, there was no evidence that the benefits motivational appeal with the strong and/or standard confidentiality statement improved the completion rates at the national, the HRA, or the LRA levels.

Finally, variations in the confidentiality message (standard versus strong) had no discernible impact on response when used in conjunction with either the mandatory or benefits message. Therefore, there is no statistical significance between the strong and standard confidentiality statements when included on the insert at the national, the HRA, or the LRA levels.

6. REFERENCES

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Table 1
Appeals and Long-Form Experiment Final Completion Rates at the National and Stratum Level

Treatment	National		1990 High Response Areas		1990 Low Response Areas	
	Estimate	Standard Error	Estimate	Standard Error	Estimate	Standard Error
1. Control	67.2	0.9	69.2	1.0	52.3	1.0
2. Benefits/Strong	69.1	0.8	71.5	0.9	50.5	1.0
3. Benefits/Standard	68.4	0.8	70.7	0.9	51.5	1.0
4. Mandatory/Strong	77.0	0.7	79.3	0.8	59.7	1.0
5. Mandatory/Standard	78.1	0.7	80.5	0.8	59.7	1.0
6. Mandatory, No Insert	76.4	0.8	78.5	0.9	60.7	1.0

Table 2
Comparison Between the Standard and the Strong Confidentiality Statement

Experimental Comparisons	Completion Rate Differences (%) and 90% Confidence Intervals (C.I.)					
	National		1990 High Response Areas		1990 Low Response Areas	
	Difference	90% C.I.	Difference	90% C.I.	Difference	90% C.I.
3 - 2	-0.6	-3.5 to 2.2	-0.9	-4.0 to 2.3	0.9	-2.5 to 4.3
5 - 4	1.1	-1.5 to 3.6	1.2	-1.6 to 4.1	-0.0	-3.5 to 3.4

Table 3
The Effects of the Benefits Motivational Appeals

Experimental Comparisons	Completion Rate Differences (%) and 90% Confidence Intervals (C.I.)					
	National		1990 High Response Areas		1990 Low Response Areas	
	Difference	90% C.I.	Difference	90% C.I.	Difference	90% C.I.
2 - 1	1.8	-1.1 to 4.8	2.3	-1.0 to 5.6	-1.7	-5.2 to 1.8
3 - 1	1.2	-1.7 to 4.1	1.4	-1.8 to 4.7	-0.8	-4.3 to 2.7
(2&3) - 1	1.5	-1.0 to 4.1	1.8	-1.0 to 4.7	-1.3	-4.3 to 1.8

Table 4
The Effects of the Mandatory Motivational Appeals

Experimental Comparisons	Completion Rate Differences (%) and 90% Confidence Intervals (C.I.)					
	National		1990 High Response Areas		1990 Low Response Areas	
	Difference	90% C.I.	Difference	90% C.I.	Difference	90% C.I.
4 - 1	9.8 *	7.0 to 12.6	10.1 *	7.0 to 13.2	7.4 *	3.9 to 11.0
5 - 1	10.9 *	8.1 to 13.7	11.3 *	8.2 to 14.4	7.4 *	3.9 to 11.0
(4&5) - 1	10.3 *	7.9 to 12.8	10.7 *	7.9 to 13.5	7.4 *	4.3 to 10.5
6 - 1	9.1 *	6.3 to 12.0	9.2 *	6.1 to 12.4	8.4 *	4.8 to 12.0

Table 5
The Effect of the Insert

Experimental Comparisons	Completion Rate Differences (%) and 90% Confidence Intervals (C.I.)					
	National		1990 High Response Areas		1990 Low Response Areas	
	Difference	90% C.I.	Difference	90% C.I.	Difference	90% C.I.
4 - 6	0.7	-1.9 to 3.3	0.9	-2.1 to 3.8	-0.9	-4.4 to 2.5
5 - 6	1.7	-0.8 to 4.3	2.1	-0.8 to 4.9	-1.0	-4.3 to 2.4
(4+5) - 6	1.2	-1.0 to 3.4	1.5	-1.1 to 4.0	-1.0	-3.9 to 2.0

* indicates that the difference is statistically significant at familywise error $\alpha = 0.10$