

REPORTED EXPOSURE TO PAID ADVERTISING AND LIKELIHOOD OF RETURNING A CENSUS FORM

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Key Words: Paid Advertising, Census Participation

Introduction

For the first time, Census 2000 will include the services of a paid advertising campaign as part of the marketing and promotion strategy. The advertising firm of Young & Rubicam, Inc. (Y&R) is under contract to the Census Bureau to develop and deliver persuasive advertising messages designed to increase mail response. Y&R has developed a multi-tiered messaging and media approach designed to increase cooperation among both the general public and the traditionally hard-to-reach minority subgroups (U.S. Census Bureau, 1999).

In 1998, the Census Bureau conducted a "Dress Rehearsal" Census to test the operations planned for Census 2000. In the Dress Rehearsal sites, Y&R tested components of its market strategy. Prior to the Dress Rehearsal, the agency developed creative products including: local television advertising, radio, and newspaper ads, out of home advertising, and a special school-based public information campaign. Media buys were in accordance with the Census 2000 media strategy, to the extent possible in a "test market", but did not include national buys of television, radio, and magazine print placement (U.S. Census Bureau, 1999). Advertising began the first week of March 1998 and continued for some media as late as the last week in June. Census Day for the 1998 Dress Rehearsal was April 18.

In this paper we examine several research questions related to the effectiveness of the paid advertising. First, we look at the factors that best predicted respondents' reported exposure to paid advertising. Second, we explore the relationship between exposure to advertising and level of 'Census knowledge'. Finally, we attempt to quantify paid advertising's impact on motivating respondents to complete and return their Census forms. To do this, we use logistic regression models to predict the outcome variable (return of form vs. no return of a form). The primary independent variable of interest is reported exposure to paid advertising.

Methodology

The Bureau contracted with Westat to conduct a Random Digit Dial (RDD) telephone survey. The survey began approximately one week after the replacement Census

form was mailed out, as the ad campaign was winding down. The survey was conducted in the Sacramento and South Carolina test sites and contained questions about exposure and recall of advertising.

Interviews were conducted between May 1 and June 1 in South Carolina and between April 24 and June 7 in Sacramento. Both samples were post-stratified and weighted up to the test site population. In Sacramento, the response rate was 54%; in South Carolina it was 64%. This yielded 1,504 cases from Sacramento and 1,506 from South Carolina.

The survey questionnaire consisted of several sections: media use, degree of civic participation, awareness of government agencies and programs, free recall of exposure to information about Census, aided recall about source of information, knowledge and attitudes about the Census, aided recall of specific advertising, and Census form receipt, handling, mailback behavior, and demographic information. These questions were similar to those asked in previous surveys following the 1980 and 1990 Censuses (Moore, 1982; Fay, Bates and Moore, 1991).

Our outcome variable of interest (Census form mailback behavior) was measured two ways: from a self-reported survey question and from Dress Rehearsal Census Bureau records. The latter measure was made available by matching addresses obtained during the survey interview to the Census Bureau master list of addresses (the Master Address File). The idea was to identify the survey address within the Dress Rehearsal site, match it to Census records and then extract information regarding the household's Census response (i.e., mailback or not). By operationalizing the dependent variable this way, we hoped to obtain a more accurate measure of behavior compared to self-reports.

Data/Design Limitations

While the evaluation concentrates specifically on the effects of paid advertising, we acknowledge that outreach and promotion activities independent of the ad campaign (e.g., local Partnership Program activities), and receipt of Census materials (prenotice letter, Census forms, reminder postcard) undoubtedly influenced awareness and are reflected to some degree in this evaluation. We do not, however, propose a clean method for separating

out the different factors.

Another limitation is that the dress rehearsal lacked a demographically similar control site with which to make comparisons. It is also important to reiterate the fact that Y&R could not purchase national media buys such as national market TV ads or ads in national magazines during the Dress Rehearsal. Because the survey was RDD, the findings reported from these data can only be generalized to telephone households in each site.

A final limitation is the unanticipated loss of cases due to RDD sampling outside the Dress Rehearsal geographic boundaries. When we performed the matching procedure of survey households to Census records, we discovered that 44% of the cases in Sacramento and 32% of the cases in South Carolina could not be geocoded back to Dress Rehearsal Census records. This reduced our number of cases from 1,504 to 844 in Sacramento and from 1,506 to 1,028 in South Carolina.

Reported Exposure to the Paid Advertising

We began our analysis by examining reported exposure to the paid advertising. The questionnaire ascertained this by asking a battery of questions about the various sources publicizing the Census. For each, respondents reported whether or not they had seen or heard any Census advertising through that particular source. Because we were interested in measuring the effects of the *paid* advertising we limited the components in our measure to sources that comprised the base Y&R advertising campaign. These included having heard or seen about Census through magazines, newspaper, television, radio, adult school, school-aged children, material brought home from school, posters, signs or handbills, or billboards. We created an exposure index by summing the number of sources cited. The resulting index score ranged from 0 to 9. Note that this index is a raw accumulation of total sources cited but does not attempt to measure the frequency with which respondents encountered these sources. Finally, we note that our exposure measure includes some media that could have disseminated non-paid Census publicity, for example, television newscasts or newspaper articles about the Census.

We performed regression analysis in order to determine which variables were relevant to an individual's exposure to the paid advertising. Here we looked at the effects of race/ethnicity, education level attained, household income, civic participation, and media consumption. Education of the respondent was categorized into less than high school, high school/some college, and college degree or higher. Respondents were asked to describe

their annual household income. From their answers, respondents in each site were classified into three income categories, each roughly equal in size: less than \$25,000, between \$25,000 and \$50,000, and greater than \$50,000.

We also measured an individual's consumption of three media sources: newspaper, television, and radio. In order to do this, we looked at the responses to questions regarding how many hours a day the respondent spent watching television, reading the newspaper, or listening to the radio. We then aggregated the responses into an index for each of the media sources.

Civic participation was defined by a battery of yes/no questions inquiring about work for a political party or candidate, non-political volunteer work, voting in the last presidential and local elections, membership in a PTA, religious organization, civic club or community organization, and membership in a union. Answers to these questions were summed with the highest score equal to 8 and lowest score equal to 0. This score was then categorized into four levels (0 activities, 1-2, 3-4 and 5 or more). We then performed regression analysis to predict an individual's exposure to the paid advertising campaign. Four dummy variables were created for race/ethnicity, (Non-Hispanic Black, Hispanic, Non-Hispanic Asian and Pacific Islander (API), and Non-Hispanic Other). The dummy variable for White, non-Hispanic was excluded from the models as the comparison category.

According to the data in Sacramento, as household income increases, reported exposure to paid advertising increases significantly as well (table not shown). Also, level of civic participation appears to have a significant positive impact upon the number of advertising sources reported. Radio listening and newspaper reading are significantly positive contributors to paid advertisement exposure. When controlling for these factors, Black, API and Other respondents were not significantly different than White respondents in terms of reported exposure levels. However, it is interesting to note that, controlling for the effects of income, civic participation, newspaper and radio exposure, Hispanics' reported exposure to paid advertising was significantly higher than that reported by Whites, suggesting that some of the targeted advertisements were seen by the appropriate audience. The regression model containing income, civic participation, radio listening, newspaper reading, and race explained approximately 13% of the variance in reported advertising exposure (adjusted R-square=.13).

The same analysis was performed for South Carolina. Once again, Whites were omitted from the analysis as a

comparison category. Here, we found that civic participation and education levels make a significant positive contribution to the number of advertising media an individual reported seeing (table not shown). Once again, although newspaper, TV, and radio exposure were all tested, only radio listening and newspaper consumption had significant positive effects on the number of advertising sources recalled. As well, after controlling for education, civic participation, radio listening and newspaper consumption, persons identifying as a race other than White reported significantly higher levels of paid advertisement exposure compared to Whites. Once again, this finding suggests that some of the targeted advertisements were seen by the appropriate audiences. The R-square for the model containing education, civic participation, radio listening, newspaper reading, and race as independent variables was .13.

Knowledge About the Census

We also performed regression analysis to see what factors contributed to knowledge levels about the Census. One component of the Y&R messaging strategy was to educate (U.S. Census Bureau, 1999). Consequently, many of the advertising material attempted to convey information about the uses of Census data, such as building new schools or health care facilities. We created a Census knowledge index in order to assess general knowledge about the Census. Respondents were asked a battery of questions as to whether the Census was used to: determine how much federal funding a community receives, decide where schools and health facilities should go, find illegal immigrants, apportion congressional seats, keep track of lawbreakers, help the government plan for the future, check up on taxpayers, and track changes in the U.S. over time. Here, much like the advertising exposure index, we summed the number of correct responses to create a knowledge index, which ranged from 0 to 8.

We then tested several factors to see which were significant in explaining the level of Census knowledge. For Sacramento, household income, exposure to paid advertisement, and education all proved to be significant factors in explaining Census knowledge independent of one another (table not shown). Once again, we found that higher levels of education and income are significant positive contributors to Census knowledge. Advertising exposure was also found to be positively related to Census knowledge—that is, as reported ad exposure increased, knowledge about Census increased significantly as well even when education, income, and race were held constant. However, controlling for income, education, and ad exposure, Blacks, APIs,

Hispanics, and Others had a significantly lower base of knowledge about the Census relative to Whites.

We also tested whether or not there was an interaction between race/ ethnicity and exposure to paid advertisement. Although we tested all race/ethnic groups (table not shown), only the interaction between paid advertising and APIs was significant. For the API communities, paid advertisements were particularly effective in removing the barrier of Census unfamiliarity reported during focus groups conducted by Y&R. The model containing advertising exposure, race, income, education and the interaction term explained 26% of the variance in Census knowledge (adjusted R-square=.26).

The same analysis was performed for the South Carolina site. Once again, education and household income, as well as exposure to paid advertisements, were positive significant factors in explaining Census knowledge. Once again, exposure to advertising produced increased knowledge, independent of other factors. Also, controlling for household income, education, and ad exposure, races other than White proved to be significantly lower in Census knowledge relative to Whites. We tested for any effects that might occur based on the interaction between race/ethnicity and exposure to paid advertisement. However, in South Carolina we found no evidence that the relationship between advertising exposure and Census knowledge was conditional upon race/ ethnicity. Twenty-six percent of the variance in Census knowledge level was explained by the independent variables advertising exposure, race, income and education (adjusted R-square=.26).

Advertising and Likelihood of Returning a Form

We next examined reported exposure to advertising and the likelihood of returning a Census form. We limited our analysis to households whose addresses matched addresses within the test sites, in order to be able to use Dress Rehearsal records to operationalize the dependent variable. Specifically, we utilized a variable indicating whether a household was in the Nonresponse Follow-up (NRFU) universe. Households that had not responded by April 30 were placed into NRFU and assigned an enumerator for personal interview. For the purposes of our analysis, all forms received *after* this date were categorized in the 'no return' category.

We began our modeling of Census form return behavior using amount of civic participation, exposure to advertising, expectation of receiving a form, race/ethnicity, education, household income, and exposure to Census Bureau mailed materials as predictor variables.

Civic participation was defined as it was previously. Exposure to paid advertising was dichotomized such that no reported exposure=0 while some reported exposure=1. Expectation of receiving a form was measured by asking those who remembered getting the form whether they were expecting a questionnaire in the mail before it arrived. Analysis of the 1990 Outreach Evaluation Survey suggests that households who were anticipating a form mailed back the form at a higher rate than those who were not (Fay, Bates and Moore, 1991). Respondents who said they were expecting a form were coded=1 and all others were coded=0.

Exposure to mailed Census materials was included in the model to control for heightened awareness as a result of having received something in the mail from the Census Bureau. The idea was to try and tease out the effects of the mail implementation strategy from the effects of the paid advertising by creating a separate variable. Those who reported hearing about the Census through something in the mail were asked follow-up questions about what they received. This included the pre-notice letter, the first form, the follow-up postcard and the blanket replacement form. Respondents who answered positively to any of these questions were classified as having heard about the Census via official Census mailings. The resulting variable was dichotomized into a yes=1 and no=0 category. Race/ ethnicity, education and income were defined as they were in the regression analysis reported in the earlier section.

When investigating predictors of Census form mail return, we tried many models, both with and without interaction terms, and will report only on the best model within each Dress Rehearsal site.

The model in Table 1 indicates that exposure to the paid advertising had a nonsignificant effect when civic participation, expecting a form, and race/ethnicity are held constant. We also ran models that included the Census 'knowledge' variable but found that both the direct effect of 'knowledge' and the interaction between race/ethnicity and 'knowledge' were not significant (results not shown). Consequently, we conclude that Census knowledge had no main effect on behavior and further, that this lack of an effect is true for each of the race/ethnic subgroups. The variable measuring exposure to mailed Census materials and education were also not significant.

However, civic participation, expecting a form, and race/ethnicity all remained significant predictors. Using the adjusted odds ratios, we can calculate the percent change in odds to see that for every one unit increase in civic

participation (e.g., moving from a lower civic participation category to the next highest) there is a 30% increase in the predicted odds of mailing back a form. Likewise, the odds of returning a questionnaire are 59% higher for those expecting a form compared to those who were not. In the other direction, we see the predicted odds of mailing back a form are approximately 47% less for Blacks compared to Whites and 36% smaller for Hispanics compared to Whites. The deviance chi-square for this model suggests a good fit of the data ($p=.649$ see Table 1).

We believed the model from Table 1 to be a sufficient fit of the data, but decided to investigate the possibility of other interactions, in part, because we had found significant differences earlier regarding race/ ethnicity and reported levels of exposure to paid advertising. We were also interested in a possible interaction between civic participation and advertising exposure. This hypothesized interaction is based upon previous research conducted by Y&R wherein a 'Census Participation Likelihood Spectrum' was developed (Baron, 1999). Y&R structured the spectrum using survey responses to a lengthy list of statements on civic participation. Three groups were created in order to classify respondents as to their likelihood of participating in the Census. Y&R is targeting all three segments with advertising but the objectives of the advertising differ. Given these targeted advertising efforts, it seemed logical to explore whether the relationship between advertising and mailback behavior might be conditional upon level of civic participation. Since the Westat survey included questions on civic participation we were afforded the opportunity to explore this interaction.

We ran the model containing all possible two-way interactions between paid advertising, race/ethnicity, expecting a form, and civic participation (not shown). None of the interactions were found to be significant. Therefore, we found no evidence that advertising exposure had a significant impact on increasing the likelihood of returning a form for some groups but not for others (e.g., Black versus whites or low versus high civic participation).

We performed a similar series of logistic regression models for the South Carolina site, including the exploration of possible interactions similar to those modeled for Sacramento. We retained all of the independent variables and included terms to measure interactions between race/ethnicity and exposure to the paid advertising, civic participation and advertising, and race/ethnicity and Census 'knowledge'. Again, we found no direct effect for advertising and no significant

interactions. We dropped the interactions and paid advertising from the model and found that the best fitting main effects model consisted of race, civic participation, expecting a form, and household income. This model yielded a good fit of the data (see Table 2).

Even when controlling for civic participation, anticipation of a form, and income we see that races other than White had an odds of mailing back a Census form that were 49% less than that of Whites. Expecting a form and civic participation have the most pronounced associations with propensity to return a form. Each one unit increase in the civic participation scale (movement from a lower category to the next highest) is associated with a 48% increase in the predicted odds of returning the form. Likewise, the estimated odds of returning a form for those who were expecting one are over twice as large as those who were not expecting one (adjusted odds ratio=2.02).

Conclusions

Despite the limitations noted previously, our evaluation revealed several interesting findings. First, we uncovered evidence that the advertising penetrated targeted subgroups effectively. Controlling for factors like income and education, we found that in Sacramento, Hispanics reported significantly higher levels of exposure to the paid advertising than Whites. Similarly, in South Carolina, races other than White reported significantly higher levels of exposure to the paid advertising compared to Whites.

Second, exposure to the paid advertising was found to be positively related to being knowledgeable about the Census. However, in Sacramento, we found that all races had significantly lower levels of Census knowledge compared to Whites. We found the same to be true for races other than White compared to Whites in South Carolina. This suggests that targeted groups have a lower baseline of Census knowledge and thus have further to go in terms of Census education.

Exposure to the paid advertising campaign did not have a significant main effect on likelihood of mailing back a form once civic participation, expectation of a form, and race/ ethnicity were held constant. We also failed to uncover evidence that level of Census 'knowledge' had any significant impact on the predicted odds of returning a form. Further, we did not uncover any meaningful interactions between things like exposure to paid advertising and race, or advertising and level of civic participation, or race/ ethnicity and Census knowledge. This finding does not support the hypothesis that advertising may be more effective at motivating some

subgroups to participate compared to others, or that Census knowledge is effective in motivating certain race/ethnic groups to participate but not others.

While our analysis failed to establish a direct link between advertising and behavior, we note several indirect effects of the paid advertising. First, we know that Census awareness increased significantly in Dress Rehearsal sites as a result of marketing program (Roper Starch Worldwide, 1998). While this increased awareness may not directly increase the likelihood of mailing back a form, it may increase cooperation with interviewers during personal visit follow-ups.

Second, we suspect that advertising also had an indirect effect on likelihood of mailing back a form by making people cognizant that a Census form would soon be arriving in the mail. The variable 'expecting a form' was one of our strongest predictors of mailback behavior. Respondents who were expecting the form before it arrived were significantly more likely to mail back the form than those who were not anticipating it. We hypothesize that advertising works to make people aware that a form is coming in the mail, and that, in turn, increases the likelihood that it will be completed and returned.

We checked the magnitude of this indirect effect by examining advertising's coefficients from the logit model with the intervening variable (expecting a form) and then again without it. The difference between the two estimates revealed that advertising's indirect positive association with mailback behavior (via expecting a form) was almost four and one-half times larger than its direct effect in Sacramento (see table 3) and approximately one and one-half times larger than its direct effect in South Carolina. These findings support our theory that advertising works indirectly to increase Census participation. Based on this, we recommend that some advertising resources go toward emphasizing the arrival of the form via mail delivery (e.g., similar to Publisher's Clearinghouse advertising).

Note: This paper reports the results of research and analysis undertaken by Census Bureau staff. It has undergone a more limited review than official Census Bureau publications. This report is released to inform interested parties of research and to encourage discussion.

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Table 1. Probability of Census Mailback Regressed on Paid Advertising, Civic Participation, Expecting a Form, and Race/Ethnicity - Sacramento, CA.

Independent Variable	Estimate	Standard Error	Adjusted Odds Ratio
Paid Advertising	0.03	0.18	1.03
Civic Participation	0.26***	0.09	1.30
Expecting a Form	0.47***	0.15	1.59
Race/ Ethnicity			
Other	-0.45	0.33	0.64
Black	-0.64***	0.21	0.53
Asians and Pac. Islanders	-0.11	0.23	0.90
Hispanic	-0.44**	0.21	0.64

N=844 * p<.10 **p<.05 ***p<.01
Deviance chi-square=58.15, d.f.=63, p=.649

Table 2. Probability of Census Mailback Regressed on Civic Participation, Expecting a Form, Race/ Ethnicity, and Household Income - South Carolina.

Independent Variable	Estimates	Standard Error	Adjusted Odds Ratio
Civic Participation	0.39***	0.09	1.48
Expecting a Form	0.70***	0.15	2.02
Races other than White	-0.67***	0.15	0.51
Household Income	-0.20**	0.10	0.82

N=922 *p<.10,**p<.05,***p<.01
Deviance chi-square=33.24, d.f.=42, p=.831

Table 3. Difference in Beta Coefficients for ‘ADVERTISING’ variable in logit models with and without ‘EXPECT A FORM’ variable.

Site	ADVERTISING’S <i>b</i> without EXPECT	ADVERTISING’S <i>b</i> with EXPECT (direct effect)	Difference (indirect effect)
Sacramento	0.174	0.032	.142
So. Carolina	0.033	-0.085	.118