

STUDY SERIES
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**Using Cognitive Research Methods
to Improve the Design of the Decennial Census Form**

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ABSTRACT

The Questionnaire Design Project was begun in 1985 as part of an effort to conduct research on how the design and question wording of the census form affects the respondent's ability to complete it correctly. It is focused exclusively on the decennial census form, specifically the long form. In this paper, the three stages of the project (observation sessions, experimental group sessions, and a mailout/mailback survey) will be described. The paper also contains results of the testing of alternative census forms using these methods and findings related to completeness and quality of response to census items.

KEYWORDS

nonresponse, cognitive research

INTRODUCTION

The Questionnaire Design Project was begun in 1985 as part of an effort to conduct research on how the design and question wording of the census form affects the respondent's ability to complete it correctly. It was begun to take a look at the census form from the respondent's point of view, and see what improvements could be made to eliminate problems and improve reporting. It is focused exclusively on the decennial census form, specifically the long form. Since the census is taken primarily by means of self-enumeration, the research involves issues of presentation as well as issues of understanding.

One of the primary goals of our research is to lessen the burden placed upon the respondent. One need only to glance at the typical census long form to see that it can be an intimidating government document second only in complexity to perhaps a tax return. To complete it correctly the respondent must carefully wade through a maze of columns, detailed directions, and machine readable circles meant to obtain information for every household member. Depending upon the number of people residing in a household, the complete census long form can be as long as twenty pages in its entirety. Research leading to a simpler questionnaire can mean the difference between high return rates or a high volume of expensive personal visits necessary for those respondents who fail to complete the form by self-enumeration.

In addition to reducing respondent burden, an improved questionnaire can mean improved quality of information for the Census Bureau. Even minor revisions to census questionnaires may result in significant improvements in item nonresponse rates, response consistency, response accuracy and the amount of clerical editing needed to correct reporting errors (DeMaio, 1985). With this in mind, the essential goal of improving the design of the Decennial Census Form is to reduce, as much as possible, the time and frustration respondents must invest without sacrificing the quality of information obtained.

The Questionnaire Design Project is part of a long-term program of research that involves a number of different stages and research methods, and the design of alternative census forms for testing. It was the first project at the Census Bureau in the current wave of interest in the cognitive aspects of questionnaire design and survey measurement, which involve in-depth exploration of the respondent's thought processes encompassed in the task of understanding and responding to survey questions (e.g., Bienias et al, 1987; Bureau of Labor Statistics, 1986; Feinberg et al, 1985). This project, however, is actually an extension of the work that was conducted at the Census Bureau in the '60s and '70s (see Rothwell, 1983, for a summary of the earlier work in this area). While the initial phase of the Questionnaire Design Project involves cognitive research methods, the subsequent stages do not. However, all the phases of the project complement each other by providing different kinds of information, which are useful to assess improvements in questionnaire alternatives, and produce a well-rounded picture of the efforts to improve the census form.

In this paper, we describe the various stages of the Questionnaire Design Project, and demonstrate the kinds of knowledge that were obtained through each one. We do this in conjunction with each of two kinds of changes that we made in designing the alternative questionnaires that are the crux of the project. These include changes to the structure of the census form, and changes to the content, including wording and question sequence. To restrict the scope of the paper somewhat, since it is not feasible to present results that pertain to the entire questionnaire, we have chosen to concentrate on the revisions we made to Page 1 of the census form. This page provides the respondent's initial perception of the tasks involved in completing the census form, once he or she has seen the cover page. The content of this page is relatively short--it includes the household roster and the question that determines whether the Census Day occupants of the household are actually residents of the address to which the form was mailed or whether they live somewhere else.

DESCRIPTION OF RESEARCH METHODS

Stage One: Observation Sessions

The first stage of the Questionnaire Design Project incorporated techniques adapted from cognitive psychology to elicit detailed information from respondents about problem areas in the census form. Two different methods were used: observation sessions (Rothwell, 1983) and "think aloud" sessions (Ericsson and Simon, 1984). In each case these were one-on-one sessions between a researcher and a subject who completed the census form. The goal of these sessions was to obtain qualitative rather than quantitative information about how respondents go about the task of completing a self-administered questionnaire, interpret and respond to census questions, and follow the instructions on the form. We hoped to uncover specific problems that respondents encountered as they filled out the census form. At this preliminary stage of the research, conducted in 1986, a single census form was involved. The form used was the 1986 test census long form, which was the most current "standard" form at the time, having been used by the Census Bureau in a test census in Los Angeles.

In the observation sessions, conducted by Census Bureau researchers (DeMaio, 1986a), volunteers from Census Bureau headquarters were recruited to participate. Care was taken to include only those employees who had very little or no day-to-day contact with census or survey forms. During the sessions, a researcher sat across from the respondent as he/she completed the form, observing carefully his/her reactions to the form and behaviors while completing it (see DeMaio, 1986b, for a description of the instructions provided to observers). The researchers played a purely observational role and were instructed to give only neutral answers to volunteers if asked for guidance or clarification on any part of the form. After the form had been completed, the researcher debriefed the respondent, asking specific questions about his/her reactions to the form based on behaviors that were observed, such as scratching his/her head at a particular item or flipping pages back and forth repeatedly and looking confused. Answers to questions about these kinds of actions can provide information about trouble spots on the questionnaire that are not necessarily obvious by looking at the completed form.

The researcher also asked questions about the respondent's understanding of specific questions or concepts included on the census form that we thought might be unclear. We wanted to know what the respondent had in mind when he/she was answering a particular question. In this way, we were able to learn about misinterpretations of specific terms or concepts included in the census questions, as well as misunderstanding of the entire question. The researcher asked a third kind of question, which referred to specific answers that the respondent provided. In reviewing the form, the researcher looked for obvious errors, such as reporting inconsistent information or improperly following the skip instructions. The researcher then asked about these answers--what the respondent had in mind in reporting the information and whether the question made sense to the respondent.

In the "think aloud" sessions, conducted by researchers under contract to the Census Bureau (Holt and Lessler, 1987), a similar one-on-one relationship between researcher and subject was maintained. However, the nature of the task was slightly different. Respondents in these sessions were asked to talk out loud as they completed the form, rather than filling it out silently. They were instructed to read the questions, instructions, etc., out loud as they read them in the course of completing the form. This provided two kinds of information: the researcher could tell which instructions and questions the respondent actually saw and read, and which ones were overlooked. Also, the researcher could tell immediately when the respondent misread a word or phrase on the census form. In addition, subjects were instructed to verbalize their thoughts as they answered the questions on the census form. This allowed the researcher to determine how the respondents went about answering the questions, how carefully and accurately they constructed their answers, and whether they were providing answers to the questions that appeared on the census form or were answering some other unintended question. These sessions provided additional information beyond that obtained in the one-on-one observation sessions. In general, however, the problem areas that were detected in the census form were similar in both the observation and the "think aloud" sessions.

Stage Two: Experimental Group Sessions

In the second stage, comparative information was obtained about the performance of two different census forms--one being the "standard" 1986 test census long form that was the initial focus of the research, and the other being an alternative form that was designed based on observations made at stage one. At stage two, we were looking for a small but systematic test of how well the two forms did. In April 1987, we conducted an experiment using groups of 25 to 50 participants each, in which a random half of the respondents received one form and the other half received the other form. A series of about 30 group sessions were conducted, and a total of 515 persons participated.

Our goal at this stage was to get an idea of broad differences in reporting on the two forms, particularly among respondents who would have a difficult time completing the census form. Therefore, the subjects that we recruited for these sessions included an overrepresentation of low education and minority respondents. Participants included people aged 18 to 80, members of different racial and ethnic groups, and people with various levels of education. The subjects were unpaid volunteers

recruited in four regional office cities (Dallas, Philadelphia, Chicago, and Boston) by Census Bureau staff who work with local community organizations and who used these contacts to schedule sessions with employees, group members, community service participants, etc.

The sessions were scheduled to last one-and-a-half hours. After a standardized introduction by a moderator, who was either a Regional Office staff person or a researcher from Washington, the census forms were randomly distributed to the participants. Fifty-five minutes were allowed for completion of the census long form. Setting a cutoff time enabled us to schedule sessions of a fixed length of time; we used a time limit slightly higher than the officially predicted average time for respondents to complete the long form (45 minutes) so most respondents would finish filling it out and we could get estimates of the amount of time it took them. When respondents were finished with their forms, or at the end of the allotted 55 minutes, they were given a separate debriefing questionnaire which was tailored to the census form they had just completed. Through the debriefing questionnaire (which asked standardized questions), we were able to collect quantifiable information about respondents' evaluations of the census form, about their interpretations of some of the questions contained on the form, and about how they answered the questions. This information was used to evaluate the performance of the questionnaire in conjunction with data obtained from the form itself, such as item nonresponse rates, different types of error rates (the questionnaires were coded for errors made by respondents in the course of being completed), and inconsistent information reported within the body of the questionnaire.

Stage Three: Mailout/Mailback Survey

The size and scope of the experimental group sessions at stage two enabled us to collect some information relatively quickly to evaluate questionnaire performance. However, because of the nature of our "sample," these results cannot be generalized to any larger population. The third stage of the Questionnaire Design Project consisted of a large-scale, nationwide field test conducted by mail. This methodology is much closer to actual census conditions, except for the lack of publicity surrounding the mailout (which leads to a lower mail return rate for our test) and lack of follow-up (which confines out test to mail returns only). This survey, which we called the National Census Test, involved a sample of 15,000 households drawn from expired rotation groups of the National Crime Survey, one of the Census Bureau's continuing surveys. It was conducted in June 1988 and involved four questionnaire panels. The control panel for this test was the Dress Rehearsal long form, and three alternative forms were tested. None of the alternative forms tested was radically different in terms of organization and appearance from the census form. In addition to providing nationally representative, generalizable results, we hoped to disentangle effects due to changes in questionnaire layout, question wording, and question sequence which were confounded in the single alternative form tested in the experimental group sessions.

After the questionnaire mailout, one reminder postcard was sent to respondents. The survey yielded 5,875 cases, with a mail return rate of 45 percent. This return rate compares favorably with return rates obtained in the census tests conducted as part of the 1990 census planning cycle.

These, then, are the methods that comprise the research program of the Questionnaire Design Project. In the rest of this paper, we demonstrate the use of these research methods as they pertain to the specific focus here: Page 1 of the census long form. This page of the census form is important for several reasons. It contains the first question on the form and gives respondents a first impression of how difficult or easy the rest of the form will be. In addition, it conveys to respondents the guidelines for who should and should not be listed as members of the household that received the form, which is extremely important for obtaining an accurate census count. The household listing incorporates the concept of "usual residence," which is the residence rule that governs where people are counted in the census. Each person is counted at his or her "usual residence" or the place where he or she lives and sleeps most of the time. This is not a concept that is easily communicated to respondents, and is illustrated on the census form by example rather than by a hard and fast rule. Following the question that asks respondents to list household members, there are lists of categories of people who should be included on and who should be excluded from the respondent's list. It is important that respondents read these lists, because the usual residence concept does not necessarily correspond to the way they would enumerate their household members using their own frame of reference. For example, a husband who works in a distant city from the rest of his family and commutes "home" on weekends would likely be included as a household member by his wife when she completes the census form for her address. However, according to census rules, he should be counted at the place where he works during the week rather than at what he considers his home. Similar kinds of discrepancies between census rules and the respondent's conception of household membership may occur with respect to college students, military personnel, and marginal or transient persons. Thus, to the extent that respondents overlook or ignore the listing examples, incorrect household membership may be obtained in the census. In addition to reading these examples, the respondents must understand the distinctions between the categories in order to provide an accurate listing of their household members according to the census rules.

There is a second issue of potential ambiguity related to the "usual residence" concept. Visitors at the address where the census form is received should not be included on the form if they have somewhere else that they usually live. However, this is only true when some persons at the census day address are visitors there. If all of the persons at the census day address are visitors or staying temporarily, then they should all be listed on the census form. In addition, they are instructed to report the address where they usually live, so the completed information on the census form can be tabulated at the location of their usual residence and they can be counted in the proper place. This confusing set of rules is communicated to respondents on page 1 of the census form. There is some evidence that they were not communicated too well in the 1988 Dress Rehearsal (Harner, 1988). In some cases, respondents reported that they had a "usual home elsewhere" (which is the census terminology for the usual residence when all the persons at the census day address usually live somewhere else). Then, in providing the address of their usual home, they gave the same addresses that the census form was mailed to. This combination of responses is inconsistent and reflects misunderstanding of the question on the census form. It also has implications for census procedures which in the dress rehearsal called for forms that contained a "usual home elsewhere" address to be subjected to additional processing operations to ensure that the people listed on the form were enumerated at the proper address. (In the dress rehearsal, misunderstanding of the question by respondents was so prevalent that the procedures were changed to eliminate additional processing of forms that had the address on the mailing label reported as a "usual home elsewhere"). The household roster on page 1 is important for another reason: it serves as a check on the completeness of the information about household members reported in the rest of the census form. After the respondent completes the household roster, he/she provides 100-percent information (and then sample information on the long form) for the first seven persons listed on the roster. During the processing of the data, the number of persons listed on the household roster is compared with the number of persons for whom at least some 100-percent information is obtained, as a coverage check. Cases in which these numbers are not the same (or when more than seven persons are listed in the roster), an additional followup is conducted to obtain information for the missing persons. Thus, the roster is an important component of the census coverage effort. If the respondent fails to answer the household roster, this comparison cannot be made.

Finally, there is another census item that does not appear on page 1 of the standard census form but is closely related to the content of this page, that is, getting an accurate listing of household membership. This is the coverage question, which appears at the beginning of the housing section. This question is intended to find out whether respondents were confused and may have left names off of the household roster because they weren't sure whether the people should be listed. It is also used to check whether respondents may have included names of persons who (according to census rules) should not have been listed. Any census form that contains a positive response to the coverage question is subjected to a followup to see if any persons are missing from the form or incorrectly included. Missing data on this item or incorrect negative responses may result in persons being omitted from the census count or counted twice. We include this item as part of the focus of this paper because of the close relationship between it and the items on page 1. In trying to understand problems with and improve respondents' understanding of the concept of household membership, this item is part of the battery of measures we worked with.

In the rest of the paper, we discuss changes that we made to page 1 of the census form as we approached them through the three methods previously described--observation sessions, experimental group sessions and the mailout/mailback survey.

OBSERVATIONAL RESEARCH RESULTS

Although the sample size of the two observational studies are small and care must be taken when interpreting the results, several consistent findings regarding page 1's layout were uncovered (see DeMaio, 1986c; Holt and Lessler, 1987). First, respondents did not necessarily follow the structure and direction of the questionnaire. That is, they had some difficulty finding the correct starting point and following the form through from beginning to end. As a result, the household listing item was frequently omitted. Some respondents opened the form and turned directly to the matrix on page 2 without even noticing page 1. Others looked at page 1 but, due to the design, did not realize it contained a question. The causes of this confusion ran the gamut from poor placement or visibility of instructions and questions to illogical sequencing of questions. This "flow" problem was particularly worrisome. If respondents do not initially grasp the overall nature of the task, they may never even begin the form, may make serious errors, or perhaps leave large areas of the form unanswered (Holt and Lessler, 1987).

A second problem concerns the instruction guide which accompanied the 1986 Census Test Form (Holt and Lessler, 1987). Many respondents had difficulty making the distinction between the instruction guide (which is a separate document) and the census form itself. Both documents are in booklet form and the instruction guide includes an example that allows for filling out a census question. In some cases where respondents filled out the example and then later confronted the identical question on the census form, they became confused. Overall, the instruction guide appeared to be more of a hindrance than a help.

Information gleaned from the two observational projects served as the spring-board from which many of the revisions to the experimental questionnaires used in the experimental group sessions and mailout/mailback survey were founded. Several kinds of changes were made to improve respondents' comprehension of the structure of the form. These include the following: new step-by-step instructions, to assist respondents in finding their way through the form from beginning to end; revised wording and typeface of skip instructions, to maintain consistency of instructions throughout the form and to visually differentiate them from other aspects of the form; and question sequence variation, to reorganize question order in a more logical fashion. Also included are revised typography to make the form appear less cluttered. Changes in typography include changes to pitch size and typeface (i.e., use of italics and use of bold lettering), different format for write-in answer blanks and changes to the blue shading used to highlight information within the form.

EXPERIMENTAL GROUP SESSIONS

The second stage of the project, the experimental group sessions, enabled us to test the theories generated during the first stage by developing an experimental form (the DC-1409) and testing it against the same form evaluated during the observational studies (the 1986 Test Census long form). Our experimental form incorporated several changes to page 1 of the census form (see Figure 1 for an illustration of these changes). To begin with, a page number was added in the upper right hand corner. This was added as part of a larger effort to help lend some cohesion to the form as well as help the respondent locate the starting point of the form. A second revision is the addition of step instructions to Page 1. The step instructions were an attempt to provide more structure and guidance by breaking the tasks on the front flap into two steps. Step One tells the respondent to make a list of all the people who live in the household. This provides a simple instruction before the respondent gets to a more complicated-looking series of instructions in Question 1. Step Two asks the respondent to re-think exactly who has been included on the household roster and explain any difficulties he/she might have had when deciding who to list.

The blue box containing an illustration of a pencil-in-hand and instructions concerning "How to Fill Out Your Census Form" were eliminated from Page 1 and their content was moved to the cover page. Question 1 was moved to the top of the page and put in small bold type. All references to "see instruction guide" were eliminated because the revised form had no separate instruction guide and instead incorporated instructions into the form. Question 1 was enclosed in blue shading on the experimental form to be consistent with shading of all the rest of the questions on the census form. In addition, the lines on which the respondent was to enter names were made solid and were preceded by letters A-K. Thus, person letters were introduced at the very beginning of the task and were used consistently throughout the form to help keep conformity of information gathered across page 1, the 100 percent questions, and the sample questions. Letters were used in place of numbers since numbers are used in so many other ways: to label questions, pages, etc. Most format changes to Question 1 were made in an attempt to encourage respondents to read the household listing rules and make Question 1 more visible.

Several question/instruction wording changes were also made to the DC-1409 in an attempt to clarify the residence rule for respondents (see DeMaio and Martin, 1987). Question 1 was changed from a statement to a question format, and a sentence was added to instruct respondents in households where everyone is only staying temporarily that their household members should be listed (see Figure 1). (This is different from the control form, since whole household temporary residents were not identified on the 1986 test census form). In addition, several elements that make up the inclusion/exclusion directions were re-worded. Specifically, wherever possible the sentences were re-written with parallel sentence construction and placed opposite each other. For example, under the list of who to include, "Persons in the Armed Forces who live here" was placed opposite of "Persons in the Armed Forces who are stationed somewhere else" under the heading of who not to include.

Finally, the DC-1409 also contained question sequence revisions to explore the "usual residence" problems discussed earlier. First, a temporary residence question was added to follow the household listing question. As mentioned previously, this question did not appear on the 1986 test census form but was included in plans for the decennial census long form. For this reason it was added to the experimental group sessions form. Additionally, the coverage question was moved out of the housing section and onto Page 1 following the instruction for Step 2. The wording was revised to provide information about some specific situations that might cause problems for respondents in completing the household listing. By providing examples, we hoped to jog respondents' minds concerning categories of people that they might not initially have thought about listing. The logic behind the sequence change was to position the coverage question immediately after the listing to which it refers. The coverage question on the 1986 test census lies at the beginning of the housing question section and respondents must flip back several pages to review their list. By re-sequencing the question, any problems or ambiguities about who to include should still be fresh in the respondent's mind.

Experimental Group Session Results

To determine whether the revised form performed any better than the control, several item nonresponse rates were calculated. In the case of the household listing (Question 1) we found evidence that the revised form appears to have been successful in lowering nonresponse (see Table 1).

With over one-quarter of the respondents to the control form leaving Question 1 blank, it is evident that respondents are simply failing to see this question altogether. As stated earlier, this error has important consequences. If the roster is left blank, the consistency check usually performed against the number of persons listed in the roster with the number of persons in the 100-percent area cannot be made. Consequently, the decision on whether a telephone or field follow-up is necessary also cannot be determined. Most likely the format changes to the revised form were responsible for making this question more visible and thus significantly lowering the nonresponse rate to the household listing.

To further examine whether our revisions to Question 1 had improved respondents' awareness of the correct household listing, we examined the debriefing questionnaire. Contained on the post-test debriefing questionnaire was a battery of vignettes that described situations of people staying in a fictitious household ("John's" household). The questionnaire contained four descriptive scenarios of people staying at the household on census day:

- 1) Sally, John's child, who is staying with John during spring vacation, but who stays with her mother (John's ex-wife) most of the year;
- 2) Bill, a college student who rents a room from John;
- 3) Ann, John's girlfriend, who just moved back in for the second time in the last three months, AND
- 4) John's brother, who is staying with John until he finds an apartment of his own.

To test understanding of the inclusion/exclusion directions, respondents were asked to indicate which of the people described in the above vignettes should be included on "John's" census form household listing. The response distributions for each vignette are presented in Table 2. In each case, the majority of respondents gave the correct answer about whether the person in the vignette should be listed on the census form. In three of the four cases, correct response was slightly higher by respondents to the revised form, but the differences are not statistically significant. We also computed a correct "score" for each respondent, which provides a better measure of the extent to which respondents understood the residence rules in general. Here the results are somewhat different. First of all, as Table 3 shows, the percentage of respondents who answered all four questions correctly is much smaller than the percentage who answered any one correctly--approximately 36 percent of the respondents to the revised form compared to 26 percent of the control group. In addition, this difference is statistically significant. Thus, respondents to the revised form appear to have a better overall knowledge of the concept of the residence rules. It is likely that the restructuring of the inclusion/exclusion directions facilitated this by making them more noticeable. Once seen, the respondent may have been more likely to then take time to read and comprehend them.

The results concerning our resequencing of the coverage question are presented in Table 4. When the coverage question is located in the housing section as it was in the control form, only 8.2 percent failed to answer. However, item nonresponse when the same question was located on the Page 1 was significantly higher at 27 percent. While nonresponse to the coverage question varied significantly across forms, the distribution of responses did not. Respondents were no more likely to report difficulty in determining who to list on one form than the other. However, given that the revised form had such a higher rate of nonresponse, we can conclude that the resequencing of this particular question was not successful. Recall that missing data to the coverage question is important because it can result in a reduction to the census count due to absence of information that sometimes triggers a follow-up.

In sum, then, some changes appeared successful and others not. Perhaps the biggest difference seen was that of item nonresponse rates to the household roster question. As will be noted in the next section, many revisions to Page 1 suggested in the DC-1409 were actually adopted in the Census's next prototype long form, the 1988 Dress Rehearsal questionnaire.

MAILOUT/MAILBACK RESEARCH

The purpose of this test was to further explore various layout, question wording, and sequence changes to the long form using a nationally representative sample and the identical method used in the census. Rather than testing only one alternative form as in the experimental group sessions, the mailout/mailback tested three experimental forms. This was done with the hope of disentangling the layout, question wording, and sequence variation effects independently of one another.

In the form tested in the experimental group sessions, the three categories of changes were all incorporated together. Therefore, it is nearly impossible to determine the independent effects of each type of revision. The mailout/mailback test controlled for this by devising three experimental forms (or panels) which consisted of varying levels of changes in an attempt to tease out the effects of each other (see Martin, 1988). Panel 1 (the control) was, again, the "prototype" form which reflected the baseline against which the experimental questionnaire versions would be evaluated. In this case the control used was the 1988 Dress Rehearsal long form (see Figure 2). This form had incorporated several changes that were contained in the revised form used in the experimental group sessions, and was therefore not identical to the control used for the experimental group sessions.

Panel 2 - Layout Changes

Panel 2 (Figure 3) contained the content of the control form and incorporated typographic and formatting revisions only. As can be seen by looking at figure 3, the layout of page 1 for the mailout/mailback was generally similar to the layout used in the experimental group tests. There were however, some additional changes. In an effort to encourage respondents to focus on the directions of who to include in their listing, the typography of the household listing and the inclusion/exclusion instructions were enclosed in a blue shaded box for Panel 2. The lines for listing household members were arranged in a single column with an identifier (person 1, person 2, etc.) preceding them. The final layout changes in Panel 2 of the mailout/mailback survey were the additional use of blue shading and rearrangement of the FOSDIC circle for the "usual home elsewhere" question. These techniques were used to maintain consistency with the use of shading on other parts of the form.

Panels 3 & 4 - Wording and Sequence Changes

Panel 3 served as the basic alternative to the standard census form; it contained the same layout and question sequence as Panel 2 and additionally incorporated changes to question wording and response categories based on results from previous research. Panel 4 contained the same wording, typography and content as Panel 3, but also included some controlled experimental variations in question sequencing. The only exception to the above, however, happens to apply to revisions made on page 1. In the context of page 1 only, Panels 3 and 4 are identical, with both containing the sequence variation experiments in addition to layout and wording changes (see Figure 4). Because we are confining our analysis to page 1 revisions, Panels 3 and 4 may be considered identical. Unfortunately, this also means that we do not have a pure test of the sequence change effect because resequencing was performed on both Panels 3 and 4.

In the mailout/mailback survey, both the control form and the revised forms included the "usual residence" question on page 1. However, the instructions on the control form for households in which all persons are staying only temporarily is very convoluted (see Figure 2). Respondents are first told after question 1 that if everyone staying at the census address is staying only temporarily, then they are to record those persons and proceed. However, in the inclusion/exclusion directions that follow, persons who "usually live somewhere else" technically fall under the first category of who not to include. This category does include an exception in parentheses which allows cases in which everyone is staying temporarily, but the seeming contradiction is very confusing. Finally, after the respondents have filled out their household list, the question of whole household usual residence again appears in question 1b. The result is a very confusing set of directions and sequencing of questions aimed at those households who have received a census form at an address other than their usual residence.

Panels 3 & 4 of the mailout/mailback contained wording and sequence changes intended to correct this problem. First, a sentence explaining the "usual residence" concept (which was included at the top of the control form) was incorporated into the instruction for Step 1 (see Figure 4). Next, the "usual home" question was moved to immediately follow Step 1 and thus precede, not follow, the household listing question. Response categories were re-worded in such a way that all respondents answer the usual residence question. Those indicating that all or some of the people staying there usually live there were given skip instructions to proceed with the household listing task. Added instructions for those whose entire household is only staying temporarily were supplied to: make certain they print their other address; clarify which residence to refer to when answering the housing questions; and to direct respondents that they should continue filling out the form. This sequence seemed to provide a more logical progression, starting out with whether everyone at the address on census day usually lives there, and then obtaining the names of the appropriate persons. It also eliminates the potentially confusing language contained on the control form.

Finally, we made some changes to the coverage question in Panels 3 and 4. This question, while not located on page 1, is closely tied to the content of page 1. We revised the wording of the coverage question in Panel 3, to try to increase the memory jog to respondents in terms of their listing of household members in Question 1. Instead of asking a single question as on Panels 1 and 2, the revised version is two-part (see Figure 5). Part a asks about persons who might be left off the respondent's list, while part b asks about persons who might also be counted at some other place. The purpose here was to provide an additional stimulus for respondents to think about, and to ask separately about the two kinds of problems that respondents might have in filling out the household roster. In addition, we

conducted a sequence experiment in Panel 4. Because the coverage question is designed to stimulate respondents to think about and provide names of persons who they are not sure whether to list, it should play a part in increasing census coverage (Martin, 1988). To test this, we purposely excluded it from Panel 4. If the coverage item is effective in increasing the reporting of persons, we will expect the average household size to be smaller in the form without the coverage question.

Mailout/Mailback Survey Results

To evaluate the success of the household listing question for the experimental panels, item nonresponse rates were again calculated. As Table 5 shows, in comparison with Table 1, the overall response rates to the household listing question are higher than the experimental group sessions for all forms. This may reflect the improvements made to page 1 of the Dress Rehearsal as a result of the experimental group session findings. It may also reflect the self-selection bias evident in mailout/mailback methods which tend to overrepresent higher educated respondents who are more "forms literate."

Regardless of the overall higher item response rates, the differences between the control panel and the experimental panels were still significant (see Table 5). All experimental panels had significantly higher response to the household listing question than Panel 1. The differences among the experimental panels, however, were nonsignificant. This indicates that the layout changes present in all three revised forms were responsible for the improvement. Had the wording and/or sequence variations made a difference, we would expect to have seen a significant difference between Panel 2 and Panels 3 and 4.

To investigate whether particular respondent subgroups were affected more than others by the changes in the experimental forms, we looked at item nonresponse to household listing by education, age and race/ethnicity. Since we don't know for sure who the respondent is, we used the age, race, and education of the person in column 1. This makes an assumption about the identity of the respondent, but we feel it is a reasonable assumption to make.

Lower-educated respondents (less than 9 years of school) and the elderly (65+) were both found to have significantly higher rates of item nonresponse to household listing overall (that is, for all four panels combined, see Table 6). Hispanics were also found to have a significantly higher rate of nonresponse when compared to Blacks and Whites. However, when we examined the possibility of any three-way interactions between respondent characteristic, nonresponse rate and questionnaire panel, we found the results to be nonsignificant. Thus, all questionnaire panels appear to be equally difficult for respondents of a given education level, age or race/ethnicity.

The next analysis from Page 1 of the mailout/mailback focuses on the "usual home elsewhere" question. During the data preparation stage, clerks must examine forms containing an address to this question to see if the address entered is truly different from the one appearing on the mailing label. If the address is different, a box located in the "for census use only" area is marked and the form is routed to its correct District Office so it will be counted at the proper place. What is important in analyzing this question, then, is whether or not respondents entered an address to this question and whether the address they entered differed from the address appearing on the mailing label. Recall that in Panel 2, only layout changes were made to this question while in Panels 3 and 4 a sequence experiment and wording changes were made.

Similar to the household roster, additional data on this question was captured during the coding process. In cases where respondents listed an address for "usual home elsewhere," a comparison was made to see whether the address listed was actually different from the one appearing on the outside envelope. Approximately 17 percent of the respondents to the control panel entered an address in the "usual home elsewhere" question (see Table 7). However, most of these (over 90 percent) were listed in error--less than 10 percent actually entered an address different from the one appearing on their mailing label. In Panel 2, which incorporated layout changes only, 9 percent reported an address but 19 percent of those persons actually entered something different than what appeared on the label.

Turning to Panels 3 and 4 which incorporated wording/response category changes as well as a different placement of the question, we see several things occurring (see Table 7). First, a much larger percentage of respondents entered an address to this question than in the control (on average, 38 percent of respondents to Panels 3 and 4 entered an address compared to only 17 percent for panel 1). However, over 90 percent of the addresses entered were in error. Obviously, many respondents to Panels 3 and 4 were failing to notice the skip instruction directing them skip over the "usual home" question and proceed with the household listing if some or all persons at the household live there permanently. In summary then, Panel 2 performed better than the control and Panels 3 and 4 in significantly reducing error to the "usual home question". However, when considering the overall percentage reporting a true "usual home elsewhere," we see that Panels 3 and 4 actually had a slightly higher rate. Among the revised forms, then, we see a trade-off in effectiveness. The experimental panel with only layout changes is the most effective in reducing the number of errors while the panels with wording/sequence changes were most successful in obtaining a higher percentage of true "usual homes elsewhere". However, because Panels 3 and 4 had such a high error rate, the amount of clerical processing necessary to

separate this higher percentage of legitimate "usual homes elsewhere" would, unfortunately, also be much higher.

The final analysis from the mailout/mailback survey concerns the coverage question. Recall that Panel 1's coverage question simply asked respondents if they had any trouble deciding who to list on the roster, Panel 2 asked the same content but used revised typography, Panel 3 broke the question into two parts, and Panel 4 omitted the question altogether. Our interests in this question were two-fold. First, by examining the coverage question in Panel 3 we can see whether the coverage concept is really a two part problem: one of either over-coverage by including persons who should actually be counted somewhere else, and/or one of under-coverage by excluding persons who should be counted. Our second interest examines whether the coverage question itself has an impact on increasing the census count by stimulating respondents to think a second time about their household list and as a result, actually add additional persons to the questionnaire.

The results of the wording variation are contained in Table 8 and illustrated in Figure 5. A very small number of respondents responded positively to the coverage question for any of the panels. Only 1.1 percent and 1.5 percent reported having difficulty in their decision of who to list in Panels 1 and 2, respectively. Positive responses to the two parts of the Panel 3 version were small as well. We also see that responses to the two parts were very similar to one another (1.8 percent vs. 2.3 percent) suggesting that respondents may be just as likely to include inappropriate people on their lists as to omit eligible household members. Thus, although only a small percentage of respondents tend to have a coverage decision problem, those who do are actually dealing with two kinds of problems in deciding who to include on their household rosters. The one-part coverage question such as those in Panels 1 and 2 may tend to mask this fact.

Given the content of the responses to the coverage question, the results of the sequence experiment we conducted are not surprising. Recall that we excluded the coverage question from Panel 4 to see what effect the item has on the census count. We calculated average household size based on the household listing question, and the results, shown in Table 8, indicate that household size for all four panels was practically identical (Panel 1, 2.5 persons; Panel 2, 2.5 persons; Panel 3, 2.6 persons; and Panel 4, 2.5 persons). There were no significant differences between Panel 4 (which excluded the coverage question) and Panels 1, 2 and 3 (which included the question). This suggests that the coverage question does not have an increase effect on the census count. This could result from the fact that because both inclusion and exclusion problems were equally likely to be mentioned, they counterbalance one another. However, we don't know the true net effect of this and can only speculate. Additionally, the number of respondents who report problems in the first place in trying to list their household roster is so small that any additions they might make to the roster might not have an effect on the average household size.

CONCLUSIONS

In this paper, we have described a three-stage program of research, which we have applied to the decennial census long form. The three stages involve three quite different methodologies--cognitively-based observations, experimental group sessions, and a mailout/mailback survey. They progress, on the one hand, from being less generalizable, relying on information provided by a very small number of basically hand-picked respondents in the observations, to being more generalizable, relying on a large nationally representative sample (a caveat is in order here, since our mail return rate of 45 percent in the mailout/mailback survey leaves lots of room for self-selection bias). On the other hand, due to the number of respondents and the amount of distance between respondent and researcher in each method, the degree to which generalizations can be made is inversely related to the amount of detailed information that is obtained directly from each respondent. Thus, they complement each other in terms of the information they provide and allow us to build on the knowledge accumulated at the previous stage.

By starting out with methods adapted from cognitive psychology, we began at the source--the respondent. We obtained first-hand information using unstandardized probing questions regarding problems that respondents had in filling out the census form, and insights regarding misunderstanding of questions, concepts, etc., that are unavailable through other methods. We were able to use these insights to develop an alternative census form that attempted to alleviate the problems that were observed.

The experimental group sessions allowed us to do some relatively quick yet systematic testing of our revised form against a control form to evaluate how well our changes worked. In addition, the relatively small size of our sessions and the direct contact with respondents enabled us to administer a standardized debriefing questionnaire that provided some quantitative information about how respondents understood the concepts and terminology in the questions. However, the nature of the participants in the sessions limited the extent to which our evaluation of the changes might be generalized to other populations.

Thus, the third stage of research involved a mailout/mailback survey, which allowed us to gauge the extent to which results obtained in the experimental group sessions could be replicated among the population as a whole (or at least the population of mail returns to our survey). At this stage, no direct contact with respondents was made, and no information was obtained in addition to completed census forms.

The differences in respondents and methods at each stage provide an opportunity for differences in results to occur, and this did happen in some cases in our research. An advantage of this multi-stage approach is that findings that hold up under a variety of conditions may be more likely to occur in the census, which is the ultimate test, as well. However, the 45 percent mail return rate in the mailout/mailback survey has clear limitations for subsequent generalizability to the census, with an expected 75 percent or higher response when accompanied by a massive public information campaign to educate and alert respondents to its presence. Thus, the next stage of this research will be to conduct another experiment with alternative census forms in the 1990 census itself.

This paper also presents results of this research program that pertain to Page 1 of the census form, which provides respondents with the basic information necessary to obtain an accurate census count. In particular, we learned from the cognitively-based observations that problems exist with the overall structure of the long form. Respondents had difficulty finding the beginning of the form and following it correctly through to the end. Based on these results, we designed an alternative long form with various layout, question wording, and question sequence changes. Testing of this form against a control in the experimental group sessions revealed that our formatting and highlighting changes resulted in: 1) a significantly higher household roster response rate; and 2) a better respondent understanding of who should and should not be counted in a "census" household. These findings suggest the potential for improved coverage using the revised form. A higher response rate to the household roster indicates that the coverage edit that uses this information can be more effective; better understanding of the concept of household membership indicates that a more accurate household listing may be obtained (this would only be the case, however, to the extent that the situations that were depicted in our vignettes actually applied to our debriefing respondents). We also discovered that moving the coverage question to Page 1 from the housing section is not helpful in reducing item nonresponse.

The forms that we designed for the mailout/mailback survey were constructed to specifically test structure, wording, and sequence changes independently. From this survey we saw that additional layout revisions to the directions for the household listing helped lower item nonresponse even further, suggesting even more effectiveness of the coverage edit on this question. We also learned that our experimental forms had different types of success in improving the "usual home elsewhere" question. The form with layout changes had less errors than the control form but did not increase the overall percentage of true "usual homes elsewhere" obtained. The form which incorporated question wording and sequence changes had a much higher error rate but simultaneously had a higher percentage of true "usual homes elsewhere" entered. Finally, analysis of the coverage question indicated that its presence does not necessarily increase the census count by encouraging respondents to add names of persons they are not sure whether to list. Some of those persons are listed when they probably should not be, while others are omitted when they should be listed. In summary, our revisions to Page 1 were successful in some areas but not in others. So far, our layout changes appear to have been the most successful overall, and the input of respondents during the initial observation stage of our research was an important component of our ability to make these improvements.

REFERENCES

- BIENIAS, JULIA, DIPPO, CATHRYN and PALMISANO, MARK (Eds.) (1987), Questionnaire Design: Report on the 1987 BLS Advisory Conference, Washington D.C.: Bureau of Labor Statistics, U.S. Department of Labor.
- BUREAU OF LABOR STATISTICS (1986), Report of the BLS-Census Bureau Questionnaire Design Task Force, Washington D.C.: Bureau of Labor Statistics, U.S. Department of Labor.
- DEMAIO, THERESA (1985), "Compilation of What We Know About 1980 Census Data," U.S. Census Bureau memorandum, June 26, 1985.
- _____ (1986a), "Early Results of the Questionnaire Design Project: Observations of Census Employees Filling Out Census Forms," U.S. Census Bureau memorandum, August 13, 1986.
- _____ (1986b), "Guidelines for Observers," Unpublished Census Bureau guide.
- _____ (1986c), "Forms Appraisal of the 1986 Test Census Long Form," U.S. Census Bureau memorandum, December 23, 1986.
- DEMAIO, THERESA, and MARTIN, ELIZABETH (1987), "Documentation of Revisions to 1986 Test Census Long Form (DC-1409), OMB Clearance 0607-0532," U.S. Census Bureau memorandum, March 16, 1987.
- ERICSSON, K. ANDERS and SIMON, HERBERT A. (1984), Protocol Analysis: Verbal Reports as Data, Cambridge, MA: MIT Press.
- FEINBERG, STEPHEN, LOFTUS, ELIZABETH and TANUR, JUDITH (1985), "Cognitive Aspects of Health Survey Methodology: An Overview," Health and Society, 63, 547-564.
- HARNER, DEBORAH A. (1988), "Observation Report-Columbia District Office and Kansas City Processing Office," U.S. Census Bureau memorandum, June 21, 1988.
- HOLT, MIMI, and LESSLER, JUDITH (1987), An Evaluation of the Long Form Questionnaire for the 1986 Census of Central Los Angeles County: Final Report - Questionnaire Design Project, Unpublished report submitted to U.S. Census Bureau.
- MARTIN, ELIZABETH (1988), "Design of the 1988 National Census Test (Mailout/Mailback Component of the Questionnaire Design Project)," U.S. Census Bureau memorandum, January 4, 1988.
- ROTHWELL, NAOMI D. (1983), "New Ways of Learning How to Improve Self-Enumerative Questionnaires: A Demonstration Project," Unpublished U.S. Census Bureau report.

FIGURE 1

Illustration of Page 1 on the 1986 Test Census Form Used in the Experimental Group Sessions

Illustration of Page 1 on the DC-1409 Form Used in the Experimental Group Sessions

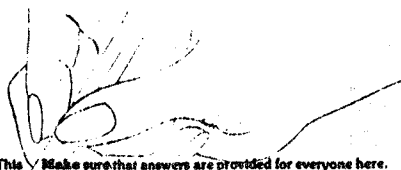
How to fill out your Census form

See the filled-out example in the instruction guide. This guide will help you with any problems you may have.

If you need more help, call the local Census Office. The telephone number of the local office is shown within the address label on the front cover.

Most questions ask you to fill a circle, like this

When you write in an answer, print or write clearly.



Make sure that answers are provided for everyone here. If more than 7 persons, see note on page 20 of this form.

See page 2 of the instruction guide if a roomer or someone else in the household does not want to give you all the information for the form.

Answer the questions on pages 1 through 5, and then starting with pages 6 and 7, fill two pages for each person in the household.

Mail back this form on March 16 or as soon afterward as you can. Use the enclosed envelope; no stamp is needed.

Please start by answering Question 1 below.

Question 1

List in Question 1

- Each person living here on March 16 including persons temporarily away such as in a general hospital, on vacation, or on a business trip.
 - Family members and relatives—including babies still in the hospital and children in boarding schools below the college level.
 - College students who stay here while attending college.
 - Partners or roommates.
 - Roomers or boarders.
 - Domestic workers who "live-in."
 - Persons who have another home, but who stay here most of the week while working.
- Each person who was visiting or staying here on March 16, and had no other home.

Do not list in Question 1

- College students who live somewhere else while attending college.
- Persons away in the Armed Forces.
- Persons away in an institution such as a prison, mental hospital, or home for the aged.
- Any person who usually stays somewhere else, including persons who live somewhere else while working.
- Any person visiting here who has a usual home elsewhere.

1. Please list below the name of each person who was living here on March 16, or who was visiting or staying here and had no other home.

If you have any questions about whom to list, please see the instruction guide.

Please enter first name, middle initial, and last name, beginning with the adult who owns or rents this home.

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Now please go to Question 2 on page 2 and answer questions for the first 7 people listed above.

Step 1. Make a list of the people who live here.

Page 1

1. What is the name of each person who was living here on Monday, March 16, including all persons who were staying here and had no other home? If no one here on March 16 lives here permanently, then list the name of each person who is staying here temporarily.

Include:

- Everyone who usually lives here, such as family members, housemates and roommates, roomers, boarders, and live-in employees
- Persons who are temporarily away on a business trip, on vacation, or in a general hospital
- Persons in the Armed Forces who live here
- Newborn babies still in the hospital
- Children in boarding schools below the college level
- College students who stay here while attending college
- Persons who stay here most of the week while working but have a home somewhere else
- Persons with no other home who are staying here on March 16

Do NOT include:

- Persons who usually live somewhere else and are visiting people who live here
- Persons who are away in an institution such as a prison, mental hospital, or home for the aged
- Persons in the Armed Forces who are stationed somewhere else
- College students who live somewhere else while attending college
- Persons who stay somewhere else most of the week while working, but have a home here

Begin with the household member (or one of the household members) in whose name the home is owned or rented. Enter last name, first name, and middle initial for each person.

A _____

B _____

C _____

D _____

E _____

F _____

G _____

H _____

I _____

J _____

K _____

2. If all of the people listed above are staying here temporarily, please fill in this circle and write the permanent address of each person next to their name.

Step 2. Think again. It's very important that the census gets an accurate listing.

3. When you were making your list, did you have any trouble deciding whether or not to include a particular person for example, an adult or child who has another home, or who is staying here for an indefinite time, or who lives here off and on?

Yes — What is (are) the name(s)? Why did you have trouble deciding whether to include the person(s)?

No

Open the flap to page 2 and continue with Step 3.

ILLUSTRATION OF PAGE 1 IN THE DRESS REHEARSAL (PANEL 1 OF THE MAILOUT/MAILBACK SURVEY)

Page 1

The 1988 census must count every person at his or her "usual residence." This means the place where the person lives and sleeps most of the time.

1a. What is the name of each person living here on Sunday, June 5, including all persons staying here who have no other home? If NO ONE staying here on June 5 usually lives here, list the name of each person staying here temporarily.

Include

- Everyone who usually lives here such as family members, housemates and roommates, foster children, roomers, boarders, and live-in employees
- Persons who are temporarily away on a business trip, on vacation, or in a general hospital
- College students who stay here while attending college
- Persons in the Armed Forces who live here
- Newborn babies still in the hospital
- Children in boarding schools below the college level
- Persons who stay here most of the week while working even if they have a home somewhere else
- Persons with no other home who were staying here on June 5

Do NOT include

- Persons who usually live somewhere else (except if EVERYONE is staying here temporarily)
- Persons who are away in an institution such as a prison, mental hospital, or a home for the aged
- College students who live somewhere else while attending college
- Persons in the Armed Forces who live somewhere else
- Persons who stay somewhere else most of the week while working

Begin with the household member (or one of the household members) in whose name the home is owned, being bought, or rented. Enter last name, first name, and middle initial for each person.

1	7
2	8
3	9
4	10
5	11
6	12

1b. If EVERYONE listed above is staying here only temporarily and usually lives somewhere else, please fill this circle and enter the address of the usual home below.

House number	Street or road/Rural route and box number	Apartment number
City	State	ZIP Code
County	Names of nearest intersecting streets or roads	

NOW PLEASE OPEN THE FLAP TO PAGE 2 AND ANSWER ALL QUESTIONS FOR THE FIRST 7 PEOPLE LISTED.

Step 1. Make a list of the people who live here. The 1988 census must count every person at his or her "usual residence." This means the place where the person lives and sleeps most of the time.

1a. What is the name of each person living here on Sunday, June 5, including all persons staying here who have no other home? If no one staying here on June 5 usually lives here, list the name of each person staying here temporarily.

Include:

- Everyone who usually lives here, such as family members, housemates and roommates, foster children, roomers, boarders, and live-in employees
- Persons who are temporarily away on a business trip, on vacation, or in a general hospital
- College students who stay here while attending college
- Persons in the Armed Forces who live here
- Newborn babies still in the hospital
- Children in boarding schools below the college level
- Persons who stay here most of the week while working even if they have a home somewhere else
- Persons with no other home who were staying here on June 5

Do NOT include:

- Persons who usually live somewhere else (except if EVERYONE is staying here temporarily)
- Persons who are away in an institution, such as a prison, mental hospital, or a home for the aged
- College students who live somewhere else while attending college
- Persons in the Armed Forces who live somewhere else
- Persons who stay somewhere else most of the week while working

Begin with the household member (or one of the household members) in whose name the home is owned, being bought, or rented. Enter last name, first name, and middle initial for each person.

Person 1 _____

Person 2 _____

Person 3 _____

Person 4 _____

Person 5 _____

Person 6 _____

Person 7 _____

Person 8 _____

Person 9 _____

Person 10 _____

Person 11 _____

Person 12 _____

1b. If EVERYONE listed above is staying here only temporarily and usually lives somewhere else, please fill this circle () and enter the address of the usual home below.

House number	Street or road/Rural route and box number	Apartment number
City	State	ZIP Code
County	Names of nearest intersecting streets or roads	

Open the flap to page 2 and continue with Step 2.

FIGURE 4
ILLUSTRATION OF PAGE 1 IN PANELS 3 & 4 OF THE MAILOUT/MAILBACK SURVEY

Step 1. Make a list of the people who live here. The 1988 census must count every person at the address where he or she usually lives. This means the place where he or she lives and sleeps most of the time.

1. Do all of the people staying here on Sunday, June 5 usually live here? Fill in one circle with a dark pencil.

- Yes, all the people staying here on June 5 live here
- No, only some of the people staying here on June 5 live here
- No, none of the people staying here on June 5 live here —

} Skip to question 2

Print the address where they usually live. Then list their names at the bottom of the page and complete the rest of this form. Note that Step 5 asks you to describe where you live. Please answer about the address where you received this form.

House number	Street or road/Rural route and box number	Apartment number
City	State	ZIP Code
County	Names of nearest intersecting streets or roads	

2. What is the name of each person living here on Sunday, June 5? Also include all persons staying here who have no other home.

Include:

- Everyone who usually lives here, such as family members, housemates and roommates, foster children, roomers, boarders, and live-in employees
- Persons who are temporarily away on a business trip, on vacation, in a general hospital, or in jail
- Persons in the Armed Forces who live here
- College students who stay here while attending college
- Children in boarding schools below the college level
- Newborn babies still in the hospital
- Persons who stay here most of the week while working but they have a home somewhere else
- Persons with no other home who are staying here on June 5

Do NOT include:

- Persons who usually live somewhere else and are visiting people who live here
- Persons who are away in an institution, such as a prison, mental hospital, or a home for the aged
- Persons in the Armed Forces who are stationed somewhere else
- College students who live somewhere else while attending college
- Persons who stay somewhere else most of the week while working

Begin with a household member in whose name the home is owned, being bought, or rented. Print last name, first name, and middle initial for each person.

Person A _____

Person B _____

Person C _____

Person D _____

Person E _____

Person F _____

Person G _____

Person H _____

Person I _____

Person J _____

Person K _____

Person L _____

Open the flap to page 2 and continue with Step 2.

FIGURE 5
ILLUSTRATIONS OF THE COVERAGE QUESTIONS FROM THE MAILOUT/MAILBACK SURVEY

PANEL 1

Page 3

NOW PLEASE ANSWER QUESTIONS H1 – H24 FOR YOUR HOUSEHOLD

H1. Did you have any trouble deciding whether or not to list a particular name(s) in Question 1 on page 1?

Yes, please print the name(s). No

PANEL 2

Page 3

Step 4. Review your list of names on page 1.

8. Did you have any trouble deciding whether or not to list a particular name(s) in Question 1 on page 1?

Yes, please print the name(s). No

PANEL 3

Page 3

Step 4. Review your list of names on page 1.

9. Fill in the circle that matches the total number of people on your list. (Include yourself.)

<input type="radio"/> 1 person	<input type="radio"/> 4 people	<input type="radio"/> 7 people	<input type="radio"/> 10 people
<input type="radio"/> 2 people	<input type="radio"/> 5 people	<input type="radio"/> 8 people	<input type="radio"/> 11 people
<input type="radio"/> 3 people	<input type="radio"/> 6 people	<input type="radio"/> 9 people	<input type="radio"/> 12 or more

10. The census must count every man, woman, and child in the United States at his or her usual residence. It's very important that each person is counted once and only once.

a. Did you leave anyone off your list because you weren't sure they should be counted as living here?

Yes — Please list the name(s). Why were you unsure whether to include the person (s)?

No

b. Did you include anyone on your list who could be counted at another place, such as a college dormitory, another house or apartment, a military base, etc.?

Yes — Please list the name(s). Where might he/she/they be counted?

No

TABLE 1

Item Nonresponse to Question 1 in the Classroom Tests

	<u>Control</u>	<u>Revised</u>
Nonresponse rate to Question 1:	28.1% (256)	6.6% (250)
$\chi^2=9.00$ d.f.=1 p<.001		

TABLE 2

Percent of Respondents to the Classroom Tests
Giving Correct Responses to Debriefing Questions
About Residence Rules*

% Giving Correct Response to Vignette About:	<u>Control</u>	<u>Revised</u>	<u>Probability</u>
Sally	76% (189)	78% (204)	$\chi^2=.281$, d.f.=1, p>.05
Bill	82% (189)	81% (205)	$\chi^2=.016$, d.f.=1, p>.05
Ann	56% (187)	62% (205)	$\chi^2=1.34$, d.f.=1, p>.05
John's brother	75% (188)	78% (205)	$\chi^2=.696$, d.f.=1, p>.05

*According to census residence rules, Sally is not a household member, Bill is a household member, Ann is a household member, and John's brother is a household member.

TABLE 3

Percent of Respondents to the Classroom Tests
Giving Correct Responses to All Four Debriefing
Questions about Residence Rules

	<u>Control</u>	<u>Revised</u>
All vignettes correctly categorized	26.5%	36.6%
One or more incorrect or "don't know"	73.5% (189)	63.4% (205)
$\chi^2=4.6$ d.f.=1 p<.05		

TABLE 4

Item Nonresponse to Coverage Question
in the Classroom Tests

	Control	Revised
Nonresponse Rate to Coverage Question:	8.2% (256)	27.0% (259)
$\chi^2=7.04$ d.f.=1 p<.001		

TABLE 5

Item Nonresponse to Household Listing in the
Mailout/Mailback Survey

	PANEL			
	1	2	3	4
Nonresponse rate to Question 1:	5.5% (1,442)	1.9% (1,446)	1.8% (1,469)	2.3% (1,518)
$\chi^2=49.00$ d.f.=3 p<.001				

TABLE 6

Nonresponse to Household Listing by Education, Age and Race
in the Mailout/Mailback Survey

	EDUCATION LEVEL				
	0-8	9-11	H.S. GRAD.	13-15	16+
Nonresponse Rate:	8.1% (682)	3.5% (714)	2.2% (1,514)	1.2% (1,433)	1.1% (1,480)
Overall: $\chi^2=112.3$ d.f.=4 p<.001					
0-8 yrs. vs. all others: $\chi^2=97.6$ d.f.=1 p<.001					
	AGE GROUP				
	<35	34-44	45-64	65+	
Nonresponse Rate:	2.3% (1,157)	0.8% (1,105)	2.1% (1,926)	4.3% (1,616)	
Overall: $\chi^2=36.3$ d.f.=3 p<.001					
Age 65+ vs. all others: $\chi^2=30.1$ d.f.=1 p<.001					
	RACE				
	WHITE	BLACK	HISPANIC	OTHER	
Nonresponse Rate:	1.8% (4,613)	2.2% (233)	4.9% (165)	3.5% (87)	
Overall: $\chi^2=8.7$ d.f.=3 p<.05					
Hispanics vs. Blks. & Whites: $\chi^2=4.6$ d.f.=1 p<.05					

TABLE 7

Summary of Response to the Usual Home
Elsewhere Item of the Mailout/Mailback Survey

	PANEL			
	1	2	3	4
% Respondents Who Reported an Address	17.4% (1,441)	8.6% (1,444)	40.0% (1,469)	35.5% (1,516)
$\chi^2=508.8$ d.f.=3 p<.001				
% Addresses Reported that were:				
SAME AS LABEL	90.8%	81.5%	92.0%	93.9%
DIFFERENT	9.2% (251)	18.5% (124)	8.0% (588)	6.1% (538)
$\chi^2=20.5$ d.f.=3 p<.001				
Total % Reporting "true" Usual Home Elsewhere	1.6% (1,441)	1.6% (1,444)	3.2% (1,469)	2.2% (1,516)

TABLE 8

Summary of Results Concerning the
Coverage Question

	PANEL			
	1	2	3	4
% Who Said "yes" in Response to the Coverage Question:	1.1% (1,294)	1.5% (1,234)	(a)1.8% (b)2.3% (1,307) (1,269)	----
Average Household Size:	2.5 (1,363)	2.5 (1,419)	2.6 (1,443)	2.5 (1,483)
a) % answering "yes" to coverage question (a):Did you leave anyone off your list because you weren't sure they should be counted as living here?				
b) % answering "yes" to coverage question (b):Did you include anyone on your list who could be counted at another place, such as a dormitory, another house, a military base etc.?				