

IMPROVING THE NAVIGATIONAL QUALITIES OF THE DECENNIAL CENSUS SHORT FORM REQUIRES PAYING ATTENTION TO THE ENTIRE MAILING PACKAGE

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Key Words: Questionnaire Design, Cognitive Interviews.

Introduction

Because of poor mail return rates in the 1990 census, the entire implementation strategy of the 1990 census came under question and a program of methodological research was undertaken to increase response rates for the year 2000 census. Thirteen variables dealing with various aspects of the census process were investigated, such as the return envelope, the number of contacts made by mail, various motivational messages, and questionnaire design (Dillman, 1994).

The experimental short forms that emerged as a result of this research differed dramatically from their decennial predecessors. Dillman et al. (1993) described them as respondent friendly, that is, as easy for respondents to complete, and as forms respondents would feel neutral or positive about, as opposed to negative. Drawing from the visual perception literature, Jenkins and Dillman (1997) concluded that the visual elements of contrast and location were used much more effectively to navigate respondents through the respondent-friendly form than the 1990 form.

By 1995, the respondent-friendly form had evolved into a green booklet. That same year questionnaire design research at the Census Bureau was expanded and a graphic design firm by the name of Two Twelve Associates was commissioned to independently develop two new forms. These came to be known as the gold booklet and the gold vertical form.

The green booklet, gold booklet, and gold vertical questionnaires were subjected to both an in-depth pretest using cognitive interviewing methods and a national mailout/mailback test, designated the 1996 National Content Survey (NCS).

Based on the results of the first round of cognitive interviews, and whatever NCS results that were available at the time, and technical and cost considerations, Two Twelve was again commissioned to develop two forms. This time, however, the forms were developed in a collaborative effort with the Census Bureau. The resulting forms came to be known as the accordion and rollfold. One of the greatest achievements with the revised set of forms was the success with which respondents were able to navigate through them in cognitive interviews.

In the paragraphs that follow, I begin by briefly describing the cognitive methodology, followed by a brief description of the original forms (the green and gold booklets and the gold vertical form). Then in the remainder of the paper, I describe the major changes that went into making the revised forms (the accordion and rollfold) a navigational success, followed by a discussion of the implications of this research.

Cognitive Methodology

In the first wave of research, 55 cognitive interviews were conducted with the green booklet, gold booklet, and gold vertical questionnaires (see Dillman et al., 1996 for a complete description of the methodology and results). In brief, 20 interviews were conducted at the Census Bureau and 35 at Washington State University with volunteers. Equal numbers of respondents completed all three forms by one of two cognitive interviewing methods: either concurrent or retrospective. The questionnaires were administered in two orders: (1) green booklet, yellow booklet, and gold vertical versus (2) gold vertical, yellow booklet and green booklet. The two questionnaire orders and two cognitive interviewing methods were preassigned and balanced across interviewers.

In the second wave of research, cognitive interviews were carried out with the accordion and rollfold (see Dillman et al., 1996, and Jenkins and Lee, 1996, for a complete description of the methodology and results). In brief, 25 cognitive interviews were conducted (12 at the Census Bureau and 13 at Washington State University) using the concurrent interviewing method. The order in which respondents were administered the questionnaires was balanced and preassigned across interviewers.

Green Booklet

For processing purposes, the green booklet was printed on one sheet of paper, which when folded in half formed a 4-page, 8 ½" x 11" booklet. It contained step instructions and individual person spaces. The half-page person spaces looked like postcards laid two to a page, each with from two to three columns of questions. Step

1 in the upper left-hand corner of the form asked for a count of persons staying or living at the address on census day (the household count question). The mailing label was placed to the right of the household count question and the "Person 1" space was placed on the lower half of the front cover page. This form asked the short form questions for up to five people living in the household. If more than five people lived there, it asked for a list of up to 12 names on the last page.

To fit into the outgoing envelope, the green booklet was folded in half widthwise with the top half of the front cover page facing the front of the outgoing envelope when stuffed inside. To complete the mailing package, a return envelope was placed on top the back half of the front cover of the questionnaire (essentially, the "Person 1" space) and a folded letter was placed on top of that. Therefore, the letter faced the back of the envelope when stuffed inside.

Gold Booklet

The gold booklet was patterned after the green booklet in that it was an 8 ½" x 11" booklet with person postcards. As with the green booklet, there were five person postcards. Each postcard had two columns of questions and white answer spaces. However, the booklets differed in color. Also, rather than containing step instructions, which began in the upper left-hand corner of the green booklet, the gold booklet presented "Getting Started" information, along with three "Getting Started" items, one of which was the critical household count question on the cover page.

Because the "Getting Started" information and items took up the entire cover page, the Person 1 space was moved to the inside of the gold booklet. Also, the mailing label was placed on the back cover page upside down from Person 5. This form did not ask for the names of additional people living at the address.

Finally, the gold booklet's mailing package was assembled like the green booklet's, except that the gold booklet was folded widthwise in the opposite direction as the green booklet to fit into the outgoing envelope. In other words, rather than being folded with the front cover facing outwards, it was folded so that the back cover faced outwards. A return envelope was placed on top of the back half of the back cover page (essentially, the "Person 5" space) and a folded letter was placed on top of that. Therefore, the letter faced the back of the envelope.

Gold Vertical

The gold vertical differed the most from either booklet. Rather than being made from one sheet of paper, which folded into standard-size pages, the gold vertical

was composed of two sheets of paper that were folded in half lengthwise and stapled together to form a 5-1/2" x 10-3/8" booklet.

The gold vertical's cover page contained motivational messages and icons rather than any questions. The "Getting Started" information and questions were moved inside the form to the first page.

Although the gold vertical contained the same number of person spaces as the booklets (i.e., five), they were person pages (i.e., they took up the whole page), rather than postcards (i.e., taking up half the page). Each had two columns of questions per page. A continuation roster for listing the names of up to three more people and the mailing label were on the back cover of this form.

This questionnaire did not need to be folded further in order to fit in the outgoing envelope. The back cover of this questionnaire faced the front of the outgoing envelope. The return envelope was placed on top of the front cover of the questionnaire (essentially the "Title page with motivational icons and messages."). The return envelope faced the back of the envelope when stuffed inside.

Selected Results of Pretests with the Green Booklet, Gold Booklet and Gold Vertical Form that led to the Development of the Accordion and Rollfold Forms.

It is impossible to describe in a paper as short as this the large number of decisions that eventually led to the development of the accordion and rollfold forms. Instead, I will focus on what I see as two of the most influential decisions regarding navigation that came out of the pretests.

1. Construction of a one-page questionnaire with person pages rather than person postcards.

Respondents were able to navigate through the person pages of the gold vertical form with fewer errors than the person postcards of either of the booklets in the first round of cognitive interviews. No one began to answer questions about the next person before finishing the person they were on in the gold vertical form, whereas from 16 to 29 percent of the respondents began to answer questions about the next person before finishing the person they were on in the booklets. Respondents who made this mistake on the booklets erroneously perceived the navigational path to be columnar, and in the debriefings it was something on which some commented negatively.

Although the gold vertical was better from a navigational perspective, it was also considered more costly to process than either of the booklets because it required the processing of two pages per questionnaire rather than one. Therefore, to limit costs, a decision was made to fold one 22" x 10-3/8" sheet of paper in two

different ways to give rise to the same size and shape as the gold vertical questionnaire (5-1/2" x 10-3/8"). The resulting accordion questionnaire was so named because of its accordion-style fold and the rollfold was named likewise because of its fold.

The fold had an effect on the cover page. So that the person pages would remain contiguous in the accordion questionnaire (i.e., one after the other like they were on the gold vertical), it was necessary to place the 'Person 4' page on what was essentially the back cover page. As a result, the mailing label needed to be placed on the cover page of this form. Since there wasn't enough space to place the mailing label and ask the "Getting Started" questions on the cover page of the accordion questionnaire, it mainly displayed the title and some introductory information. However, one of the major navigational findings from the first round of cognitive research was that one of the reasons a greater percentage of respondents (45%) recommended that we use the green booklet as opposed to either the gold booklet (22%) or gold vertical (33%) in the next census was because they perceived it as allowing them to start answering questions right away. So this feature was incorporated into the rollfold. The mailing label was placed on the back cover page of the rollfold, the "Getting Started" questions were asked on the cover page, and a continuity was maintained between person pages on the rollfold.

2. Definition of a clear and unmistakable starting point.

In keeping with respondents reporting that they wanted to get started right away, the first round of cognitive interviews also revealed that respondents had a tendency to ignore what they perceived as superfluous information.

It was obvious that the questionnaires contained words telling respondents where to start, like the phrase "Getting Started," but these words did not work in unison with the visual information on the questionnaire to establish a clear starting point. For example, although the "Getting Started" information on the inside cover of the gold vertical was meant to help a respondent understand what the questionnaire was about and why it was important to respond (essentially this information took the place of the cover letter on this questionnaire), it looked unimportant because of the way it was visually presented. It was put in blue lettering, while everything else was put in black lettering, and it was put outside the targeted gold background area in what looked like unimportant floating white space.

The figure-ground treatment of this space was saying, "This is optional information." Furthermore, the phrase "Getting Started" sounded short for "Here's optional information you need to get started." Therefore, it was not surprising that respondents ignored this information, to the extent that as much as six percent of the respondents

left the household count question blank in the first round of cognitive interviews.

The same can be said of the green booklet. Although the small green box to the left of the label said "Step 1," it too was overlooked by respondents. Fifteen percent of the respondents in the first round of cognitive interviews overlooked this item, some of which reported during the debriefing that they accidentally overlooked it because it looked like nothing more than instructions to them. Although respondents did not read every piece of beginning information on the green booklet and gold vertical, at least the majority of respondents didn't mistakenly start on the back of these questionnaires, the way they did on the gold booklet. Because the mailing label was affixed to the gold booklet's back page so that the back page came out of the envelope facing respondents, and because the mailing label area could reasonably be interpreted as the cover page, and because the "Person 5" space looked as though it might reasonably be interpreted as "Person 1," nearly three fourths of the respondents in the first round of cognitive interviews spent some time looking at the back page before turning to the front page. Some respondents were so confused that they erroneously turned the questionnaire around and began to report themselves in the "Person 5" space.

Consistent with the results of the cognitive interviews, preliminary data from the 1996 National Content Test (NCT) showed high item nonresponse to the household count question in the green booklet (21.6%) (Griffin, 1996). Also, item nonresponse to the household count question on the gold vertical form was high as well (17.6%) and it was lowest on the gold booklet (9.8%).

Both the cognitive and field test results suggested that although respondents had more difficulty getting to the front cover of the gold booklet, once they did, they were more likely to answer the household count question in the gold booklet than either the green booklet or gold vertical because the household count question was not in competition with the "Person 1" questions on the gold booklet, the way it was on the green booklet or the gold vertical form. It was hypothesized that the "Person 1" heading, along with the saliency of the "Person 1" questions, and the large amount of white answer space in them attracted respondents' attention away from the "Getting Started" questions in favor of the "Person 1" questions.

Therefore, in the redesigned accordion and rollfold, an effort was made to define an extremely clear starting point. To begin with the phrase "Start Here" was substituted for the phrase "Getting Started" because it was more directive, less ambiguous, and didn't impart the notion of an optional starting point. Also, the "Start Here" heading was made to look the same as the "Person" headings (i.e., same font, size, and figure/ground

treatment) in an attempt to visually impart the notion that the "Start Here" information was as important as the "Person" information.

Once respondents' eyes were attracted to the "Start Here" heading, it was deemed important that all of the other information on the page be saying "Start Here" as well. The first sentence on the redesigned questionnaires contained an important instruction "If possible, the census short form should be filled out by one of the people living at this address who owns or rents this house or apartment." There was a real tendency for others to want to signal that this was an instruction by italicizing it and placing it in an unmarked position before the first question. However, when information is made to look subordinate to other information on the questionnaire, not surprisingly, respondents treat this information as subordinate. Therefore, this instruction was made to look like the rest of the information (i.e., have the same font, type size, boldness, etc.) and was given the number 1. As a result, the "Start Here" heading and the number "1" converged in an effort to unambiguously define the starting point.

While it seemed that the above changes were going to work well on the cover page of the rollfold questionnaire, a problem with the accordion questionnaire still existed. That is, the "Start Here" panel was no longer on the front page, but on the inside cover, directly preceding the Person 1 panel, both of which were visible when one flipped the questionnaire open. Despite the changes made thus far to attract respondents' attention, skipping over the "Start Here" questions in favor of the "Person 1" questions was still seen as a likely threat on the accordion. Eventually this problem was solved by suppressing the "Person 1" panel and creating one large "Start Here" panel in its place. The "Person 1" heading was eliminated and the questions were incorporated so that they sequentially followed the "Start Here" questions.

Selected Results of Cognitive Interviews with Accordion and Rollfold Forms.

The second round of cognitive interviews confirmed that the accordion and rollfold forms were relatively well designed from a navigational point of view. All but two respondents (92%) began in the right place, and all but two (92%) successfully navigated through the form without missing or skipping questions. Not only that, but the kind of information that was missed was an improvement too, for not one person overlooked the "Start Here" or "Person 1" questions. Consequently, in cognitive interviews, item nonresponse to the critical household count question was zero in both questionnaires.

Contrary to expectations, the rollfold appeared to be the more promising of the two forms because when respondents took it out of the envelope, and laid aside the cover letter, the "Start Here" page was facing them right side up. Consequently, not one respondent had trouble getting started immediately on the rollfold.

In contrast, once respondents laid aside the cover letter on the accordion, the "Person 4" page was facing them upside down. Despite its being upside down, a couple of respondents erroneously turned this page around and began to fill in the "Person 4" space as though it was "Person 1," the same as respondents had done on the back page of the gold booklet.

Although respondents had less trouble starting the rollfold correctly, they also had a little bit more trouble operating its fold correctly. Generally, the fact that the accordion or rollfold were anything other than booklets was not apparent to respondents. We know that visual perception depends on two sub-processes (Matlin, 1994). Bottom-up processing has to do with the actual taking IN of a stimulus. In contrast, top-down processing emphasizes the placement of our expectations ON a stimulus. In the world of print, books or booklets are the norm, not rollfolds or accordions, which is why respondents generally treated the rollfold and accordion as a booklet.

It turned out that one could treat the accordion fold as a booklet and follow it through to its conclusion without missing any information. However, the same was not true with the rollfold. To answer the rollfold correctly required lifting the "Person 3" page at the spine, which one respondent failed to do. As a result, she reported two children in the continuation roster that should have been reported in the "Person 4 and 5" pages.

Discussion

One of the major implications of this research is that controlling respondents' navigation through a self-administered questionnaire requires a system's approach; that is, we need to stop thinking of the questionnaire in isolation, and to begin to consider instead how it behaves in unison with other mailing pieces. If this research is any indication, a self-administered questionnaire can roughly be thought of as having three major navigational sections: a beginning, middle, and end, and importantly, these sections are not limited to the questionnaire itself but include the other mailing pieces of the mailing package. A little has been written about the beginning process, but mainly the discussion centers on the questionnaire. For instance, in early laboratory studies with the decennial short form, Rothwell (1985) observed that most people who had less than eight years of school could not *start* (my emphasis) to fill a census-like form

and that better educated people (with at least some high school) just made fewer of the same kinds of mistakes as the less educated. DeMaio et al. (1987) wrote that some respondents did not know where to *start* (again, my emphasis) the census long form and skipped Question 1 (the listing of household members) entirely. Dillman and I (1995 and 1997) talked about getting respondents started correctly, but we too concentrated on the questionnaire itself.

To my knowledge the only real emphasis with regard to the importance of the entire mailing package comes from a small section entitled "Assembling the Mailout Package" in Dillman's book (1978). With foresight, he wrote, "Insisting, which we do, that there is a 'best' way to fold the cover letter, questionnaire, and business reply envelope together and stuff them into an envelope may strike some as rather fastidious. Nonetheless, we believe it is important and worthy of mention."

The results of this research suggest that the interface between the questionnaire and the other mailing pieces is truly an important consideration because, as we have seen, respondents must navigate through the entire mailing package, not just the questionnaire. They must get from the outgoing envelope to the beginning of the questionnaire with as little trouble as possible, and they must do the same at the end, only in reverse.

After the first round of interviews, I concluded that since respondents were likely to view the page with the mailing label as the beginning of the questionnaire, we should put the mailing label on the page where we wanted respondents to start. As it turned out, this was right only so long as the questionnaire was a standard-size booklet folded in half widthwise before being stuffed into the envelope, like the green and gold booklet. It wasn't true in the case of a narrower form that didn't need to be folded before being stuffed into the envelope, like the gold vertical, accordion, or rollfold. In their case, generally the opposite was true. The mailing label was on the front cover of accordion form, and as a result, it came out of the envelope with its back facing respondents. In contrast, the mailing label was on the back cover of the gold vertical and rollfold, and generally, they came out of the envelope with their front covers facing respondents.

Although the gold vertical and rollfold were designed with the mailing label on the back cover, they also differed in that the gold vertical package didn't contain a cover letter, whereas the rollfold did. The addition of the cover letter may be what explains the increase in the percentage of respondents who began by looking at the front cover of the rollfold (100%) compared to the front cover of the gold vertical (64%). It may be that respondents took their cue about where to start to look at the mailing package contents based on where the cover letter was positioned, and if no cover letter existed, then

odds were greater that they erroneously began by looking at the wrong cover.

Based on this evidence, it appears that the best strategy may be to include a cover letter, and the best assemblage of the mailing pieces is to place the cover letter directly over the questionnaires' starting point, with the information on both pieces flowing in the same direction, as was the case with the rollfold.

If that's not possible, an assembly that is almost as good at getting respondents started on the cover page correctly is to place a folded cover letter over a questionnaire that is folded with its cover page facing outwards, as was the case with the green booklet. Ninety-six percent of the respondents began by correctly looking at this questionnaire's cover page. However, because the cover letter and questionnaire's information wasn't flowing in the same direction, better care must be taken to define the starting position on the cover page correctly. If you remember, 15 percent of the respondents overlooked the critical "household count" question, Step 1, on this questionnaire.

The worst designs, however, are those that have the cover letter positioned over pages that can be mistaken as starting pages by respondents, like the "Person 5" space on the gold booklet, or the "Person 4" space on the accordion. Respondents must make it past this information to the correct starting position, which at the very least is inefficient, and in the worst case scenario leads to the incorrect reporting of data.

Conclusion

In this paper, I described and discussed a program of research aimed at improving the navigational qualities of the decennial census short form. A major conclusion to be drawn from this research is that there is an important and complex interaction between the outgoing envelope, the letter, the cover page, and the mailing label that has generally been ignored. Having learned something about this from the first round of cognitive interviews, changes were made to the second set of questionnaires so that respondents were able to more smoothly and correctly begin the questionnaire. However, contrary to expectations, the rollfold outperformed the accordion in this regard, which led to a further elaboration of how respondents navigate from envelope to questionnaire via the cover letter.

In addition, controlling respondents' navigation through the questionnaire once they began to fill out the questionnaire was accomplished, especially given the one-page constraint that was faced. Here the accordion questionnaire had a slight edge over the rollfold because once respondents got started correctly, they simply needed to follow a well-defined vertical flow of

information to the end. The rollfold required respondents to operate the fold correctly, which one out of twenty respondents failed to do. But in either case, item nonresponse to the critical household count question lessened.

Where the research may have fallen short was with the ending part of the navigational process, that is, getting respondents to place the questionnaire back into the envelope correctly. It is not surprising that this is an area still in need of improvement. Virtually nothing has been written about this process in the literature and although this research attempted to address this issue (see Dillman et al., 1996 and 1997 and Jenkins and Lee, 1997 for further discussion), because of time and resource constraints, the priority was with getting respondents started correctly and navigating through the form. The ending part of the navigational process is most certainly an area in need of further research and discussion.

Acknowledgments

Don Dillman, Elizabeth Martin, Terry DeMaio, Meredith Lee, and the author deserve credit for designing and conducting the research discussed in this paper. The author merely takes credit for selecting and organizing the specific results presented in this paper, and for discussing the selected results.

Opinions expressed in this paper are those of the author and should not be construed as representing the U.S. Bureau of the Census.

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