

The 2010 Census Alternative Questionnaire Experiment: Replication of the 2000 Census Questionnaire¹

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Abstract

Traditionally, the Census Bureau has conducted an experiment during the decennial census in order to evaluate the cumulative effects of all content changes to the questionnaire from the previous census. The most recent chapter of this tradition was undertaken as part of the 2010 Census Alternative Questionnaire Experiment. Specifically, research was conducted to compare the results from a control panel using the 2010 Census questionnaire to those obtained from a questionnaire that replicated the Census 2000 questionnaire wording, categories, order, and other essential design features. Numerous changes were made to the 2010 Census questionnaire, compared to the short form used in Census 2000. In addition to changes in the overall questionnaire format and appearance, almost every census data item underwent at least some change in terms of question wording, response categories, and/or instructions. By comparing the Census 2000-style questionnaire with the 2010 Census questionnaire in the same timeframe, we were able to eliminate the impact of real changes to the population to more clearly assess the combined effects of the questionnaire design changes. This paper describes the results of the experiment.

Key Words: Census, questionnaire design, item nonresponse, self-response

1. Introduction

During the 2010 Census, the Census Bureau implemented the Alternative Questionnaire Experiment (AQE) in which various questionnaire treatments were tested. As part of the AQE, the Census 2000 Form Replication Panel was designed to determine the combined data effects of all questionnaire changes made in the 2010 Census mail questionnaire since Census 2000.

2. Background

Since 1970, the U.S. Census Bureau has implemented an experimental program to evaluate a variety of alternative methodologies and questionnaire design strategies. Traditionally, an experiment has been conducted during the decennial census in order to evaluate the cumulative effects of all content changes to the form from the previous census. This research continues this decades-old tradition.

In this experiment, we compared questionnaire content from two censuses. Specifically, we compared data from a control panel using the 2010 Census questionnaire to data obtained from a questionnaire that replicated the Census 2000 questionnaire wording, categories, order, and other essential design features. By comparing results from the

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Census 2000-style and 2010 Census questionnaires in the same timeframe, we were able to eliminate the impact of real changes to the population to more clearly assess the combined effects of the questionnaire design changes. Numerous changes were made to the 2010 Census questionnaire, compared to the short form used in Census 2000. In addition to changes to overall questionnaire format and appearance, almost every census data item underwent at least some change in terms of response categories, instructions, and/or question wording. Although most changes were critically tested during the mid-decade to evaluate their impact, some minor changes were implemented based on subject matter expertise.

Major changes to the individual questions will be discussed in the results section. Images of the two questionnaires can be found in the Appendix. Some changes to overall questionnaire format and appearance were also made, such as the size of the questionnaire header and removal of the United States Department of Commerce seal, among others. Overall, the 2010 Census questionnaire contained much less white space than the Census 2000 questionnaire. White space includes the space surrounding questions and response options as well as the margins.

3. Methodology

3.1 Panel Design

The Control panel, or the 2010 Census Content panel, used the production 2010 Census questionnaire. The Census 2000 Content panel incorporated the Census 2000 short form questionnaire content on a 2010 Census-style questionnaire. That is, the questionnaire was blue and had the same look and feel as the 2010 Census questionnaire, but contained Census 2000 questionnaire wording, categories, order, type size, and other essential design features. Since images of the 2010 Census form were frequently used in 2010 advertisements and promotional materials, we wanted households who received the Census 2000 Content panel to know that the form they received was indeed their 2010 Census form. Therefore, it was important to use the 2010 color and style to maintain the same look and feel as the standard census form in an effort to eliminate any extraneous confounding factors. Experimental questionnaires were sent to a sample of households in lieu of the production 2010 Census questionnaire and were used for both the initial and replacement mailings.

The sample was selected from the mailout/mailback enumeration areas in the 50 U.S. states and the District of Columbia. The final sample size was just over 18,000 per panel.

The mailing strategy for both panels was similar to the production 2010 Census mailing strategy. Each sample household was mailed an advance letter, an initial questionnaire, and a reminder postcard. A targeted replacement questionnaire was sent to nonresponding households as of a pre-determined cutoff date.

3.2 Evaluation Measures

Return rates were calculated for the initial and replacement questionnaires, as well as overall. The following formula was used to calculate return rates:

$$\text{Mail Return Rate} = \frac{\text{Unduplicated Nonblank Mail Returns}}{\text{Occupied Housing Units in Universe}} * 100$$

Item nonresponse is the percentage of records with missing data for a particular item, and is one indicator of data quality. Item nonresponse was calculated as follows:

$$\text{Item Nonresponse Rate} = \frac{\text{Number of "Missing" Responses}}{\text{Total Records}} * 100$$

We also tested for differences in response distributions that may have occurred due to the form design differences. Specifically, we looked at tenure, relationship, sex, age, Hispanic origin, and race. Additionally, we examined race by Hispanic origin.

When assessing item-level differences between the 2010 Census content and the Census 2000 content, there is an important overarching limitation that must be considered. Prior to implementing item-level changes on the 2010 Census questionnaire, the impact of those individual changes were tested during mid-decade tests. However, the 2010 Census form was the first time that we evaluated all of the changes together on the same form. The changes made to the 2010 Census form (including question changes and overall questionnaire format) resulted in the 2010 Census form having less white space and a more crowded appearance than the Census 2000 form. Therefore, we are not able to determine the individual causal factors for differences in any specific item. As such, the combined effects of all changes to the form must be considered when assessing the causal nature of item-level differences.

4. Results

4.1 Mail Return Rates

Mail return rates were the primary analytical measure used to evaluate the overall impact of all questionnaire changes made between Census 2000 and the 2010 Census. Table 1 contains mail return rate estimates by panel for the initial and replacement mailings, as well as overall at the national level.

Table 1. Mail Return Rates and Panel Differences by Mailing

PANEL	Initial	Replacement	Overall
Census 2000 Content	72.2 (0.39)	7.3 (0.23)	79.6 (0.34)
2010 Census Content	71.4 (0.40)	6.8 (0.23)	78.2 (0.35)
Difference (Census 2000 – 2010 Census)			
Census 2000 – 2010 Census	0.8 (0.57)	0.6 (0.32)*	1.4 (0.51)*

Source: Census Program for Evaluations and Experiments (CPEX) Sample and Response Files

*Denotes statistically significant difference between panels with an error rate of $\alpha=0.10$.

Although there were no differences in the initial questionnaire mail return rates, compared to the Census 2000 Content panel, the 2010 Census Content panel had a significantly lower replacement mail return rate and a significantly lower overall mail return rate. In research and planning meetings leading up to the 2010 Census, there were concerns that the questionnaire appeared too crowded. Presumably, the crowded look of the questionnaire may have caused some respondents to be less willing to complete it, although we do not have definitive causal evidence to support this conclusion.

4.2 Household-Level Item Results

There were two household-level items that appeared on both census questionnaires. These items were population count and tenure. Both items were evaluated based on item nonresponse and response distributions.

4.2.1 Population Count

The population count item is a household-level item that asks: “How many people were living or staying in this house, apartment, or mobile home on April 1, 2010?” This item was worded in the exact same way on both questionnaires. Changes to the 2010 Census questionnaire included the placement of the population count question, the placement of the response box, and the format of the residence rules instructions. The population count item was moved from the top of the residence rules instructions to the bottom and the response box was placed after the question stem, as opposed to being placed before the question stem. Additionally, the residence rules instructions were modified from the include/exclude lists used in Census 2000, to the principle-based approach used in the 2010 Census. The principle-based approach attempted to explain the central principles and concepts behind the enumeration. This modified instruction was designed to let respondents decide who should be included on the roster, based on the principles.

The item nonresponse rate for the population count question on the 2010 Census Content panel was significantly higher (1.4 percent), compared to the Census 2000 Content panel (1.0 percent). Research on visual design and layout suggests the importance of identifying a clear starting point on questionnaires (Dillman, 2000). Since the population count question was placed after the residence rules instructions on the 2010 Census form (compared to immediately after the “Start Here” instruction on the Census 2000 Content panel), respondents may have had difficulty finding the starting point. It is also possible that the shading and box around the residence rules instructions and the population count question drew respondents’ attention away from it or caused them to think the question was just part of the instructions. However, it is important to note that this test did not produce data on the quality of these responses, and the design of the Census 2000 Content panel questionnaire could also have been problematic from a quality perspective, since the response box appeared before the instructions. Lastly, more research is necessary to determine whether a decrease of 0.4 percentage points is meaningful.

4.2.2 Tenure

Tenure is a household-level question that determines if the residence is owned or rented. The response options for tenure had some wording changes as a result of mid-decade testing. For instance, with the decreased use of actual cash to pay for housing costs, the 2005 NCT determined it was best to remove the word “cash” from the renter categories to avoid confusion (Rothhaas et al., 2006). The 2005 NCT also tested the inclusion of the phrase “include home equity loans” in the “Owned by you or someone in this household with a mortgage or loan” response category, which led to a shift in respondents reporting owning a home outright to owning a home with a mortgage in that test. Both of these changes were implemented on the 2010 Census questionnaire.

The tenure item nonresponse analysis revealed that the question on the 2010 Census Content panel had significantly lower item nonresponse overall (2.2 percent), compared to the Census 2000 Content panel (3.1 percent). It is possible that the clarification to the tenure response options decreased confusion and allowed more respondents to be able to answer the item. However, it may also be that the design of the Census 2000 Content panel form was problematic for this question. The response boxes in the left column of

the Census 2000-style form were not very prominent and the tenure question may have been lost between the lengthy residence rules instructions and the prominent bold question wording for determining Person 1. As a result, respondents may have skipped over tenure more easily on the Census 2000 Content panel form.

Response distribution results indicated no significant differences between the two panels for any of the tenure response categories.

4.3 Person-Level Item Results

4.3.1 Relationship

The relationship item underwent several changes between Census 2000 and the 2010 Census. These changes included changing the Natural-born son or daughter response category to Biological son or daughter, removing the Foster child category, removing the write-in box for the Other relative category, and removing the “If NOT RELATED” spanner above the nonrelative categories. In addition, the 2010 Census form lists the response options in two columns of the same length, instead of organizing the columns by related/not related as was done on the Census 2000 form.

The item nonresponse analysis for the relationship question yielded no significant differences between the two panels. In terms of response distributions, it was hypothesized that the Foster Child responses would be redistributed into the Other nonrelative or Other relative categories. Results indicate that there was a higher proportion of Other nonrelative responses in the 2010 Census Content panel compared to the Census 2000 Content panel, but no significant differences in the Other relative category. The increase in Other nonrelative was 0.5 percentage points, which was higher than the 0.1 percent of people who responded with Foster Child in the Census 2000 Content panel. Therefore, the increase in the Other nonrelative category does not appear to be solely due to a shift from the Foster Child category.

There was a significant difference, between panels, for the multiple responses category, which represents the respondent marking two or more relationship responses. The Census 2000 Content panel had more multiple responses than the 2010 Census Content panel (difference of 1.0 percentage points). This is consistent with the 2005 NCT finding that the removal of the “If NOT RELATED to Person 1” spanner over the nonrelative categories led to a reduction in multiple relationship reporting (Rothhaas et al., 2006).

The 2010 Census Content panel also resulted in a significant increase of reporting in the Parent-in-Law category, as well as a significant decrease of reporting in the Roomer or Boarder category. It is possible that these results were due to a primacy effect, due to the placement of these categories on the two forms (see Appendix).

4.3.2 Sex

The sex item did not undergo any changes between Census 2000 and the 2010 Census. Item nonresponse analysis revealed that the 2010 Census Content panel had item nonresponse rates that were significantly higher (1.7 percent), compared to the Census 2000 Content panel (1.4 percent). Since there were no changes made to this item since Census 2000, we assume that the item nonresponse difference is due to the crowded appearance of the 2010 Census questionnaire. Response distributions were also examined for the sex question. As expected, there were no significant differences in the distributions across the two panels.

4.3.3 *Age and Date of Birth*

For the age and date of birth questions, an additional instruction was included to clarify how respondents should report babies' ages. Previous research (Spencer and Perkins, 1998) has shown that the ages of babies less than one year old were frequently reported in months then erroneously captured as age in years. For example, a baby reported as 9 months would be captured as 9 years. The 2005 NCT tested a new instruction that asked respondents to "Please report babies as age 0 when the child is less than 1 year old." Results showed an increase in reporting of age zero. The additional instruction was included on the 2010 Census questionnaire. Another difference between the Census 2000 Content panel and the 2010 Census Content panel is that the date of birth question was placed below the age question, for Person 1 only, in the Census 2000 panel questionnaire. On the 2010 Census form, age and date of birth appeared next to each other. For Persons 2 through 6, the age item was identical in both panels.

Item nonresponse rates were computed for all occupied housing units. For the item nonresponse analysis, age and date of birth were examined jointly because both items were used to determine age. If the date of birth was complete enough to calculate an age, the calculated age was used. If the date of birth was not complete enough, or invalid, but the respondent provided a valid age (less than 116 years), the respondent-provided age was used. In order to be considered a nonresponse, both the date of birth and age responses must have been missing.

Results showed a significantly higher item nonresponse rate for the 2010 Census Content panel, for Person 1. This is likely attributed to the differences in formatting. As stated before, for Person 1 only, the age and date of birth questions were stacked in the Census 2000 Content form but side by side on the 2010 Census Content form. It is possible that the side by side format on the 2010 Census-style questionnaire made the item easier to miss because it did not take up as much space as the item on the Census 2000-style questionnaire. There were no overall differences between panels for Persons 2 through 6.

The response distribution analysis used only the respondent-provided age and did not take into account the date of birth. This was done because we were interested in examining how respondents reported age, rather than a composite response of age and date of birth. This was especially important for examining the effects of the instruction to "Please report babies as age 0 when the child is less than 1 year old." The response distribution results for respondent-provided age yielded a significantly higher proportion of respondents reporting age zero for Persons 2 through 6 in the 2010 Census Content panel (1.6 percent) compared to the Census 2000 Content panel (1.1 percent). Therefore, it appears that the instruction to report babies as age zero was successful.

4.3.4 *Hispanic Origin and Race Item Results*

Changes to the Hispanic origin and race questions were extensively tested between Census 2000 and the 2010 Census. The changes to the Hispanic origin question were numerous. First, the wording of the question changed. In Census 2000, the question asked if the person was Spanish/Hispanic/Latino. In the 2010 Census, the question asked if the person is of Hispanic, Latino, or Spanish origin. Second, the question in Census 2000 provided the instruction, "Mark (X) the 'No' box if **not** Spanish/Hispanic/Latino," which the 2010 Census questionnaire removed. Third, in Census 2000, no Hispanic origin examples were provided to the Yes, another Hispanic, Latino, or Spanish origin category while examples of six Hispanic origin groups (Argentinean, Colombian, Dominican, Nicaraguan, Salvadoran, Spaniard, and so on) were added in the 2010 Census

questionnaire. Finally, the fourth change was the addition of a new instruction in the 2010 Census that was not used in Census 2000. The instruction stated, “NOTE: Please answer BOTH Question 8 about Hispanic origin and Question 9 about race. For this census, Hispanic origins are not races.”

There were three changes to the race question. First, the 2010 Census removed the instruction “to indicate what this person considers himself/herself to be” from the question stem. Second, the Census 2000 race question asked the respondent to “Mark (X) one or more races” while the 2010 Census race question asked the respondent to “Mark (X) one or more boxes.” Lastly, the 2010 Census race question provided examples to the Other Asian response category (Hmong, Laotian, Thai, Pakistani, Cambodian, and so on) and the Other Pacific Islander response category (Fijian, Tongan, and so on). The Census 2000 race question did not provide any specific examples.

The analysis revealed that, compared to the Census 2000 Content panel, the 2010 Census Content panel item nonresponse rates were higher for Hispanic origin with a difference of 0.9 percentage points, but lower for the race item with a difference of 1.1 percentage points. Since several changes were made to the Hispanic origin and race questions throughout the decade, it is difficult to pinpoint any particular reason for the differences. However, one possible explanation may be the addition and removal of the instructional notes to the two items. The Hispanic origin item had a longer note in the 2010 Census Content panel (compared to the 2000 Content panel), which is where results showed significantly higher item nonresponse. Conversely, the race item had a shorter note in the 2010 Census Content panel, which is where results showed significantly lower item nonresponse. It is possible that the longer notes/instructions appearing above the question caused respondents to overlook the question. However, the 2010 Census questionnaire was the first time all of the race and Hispanic origin changes were evaluated together on one form, as a composite set of treatments within a controlled experiment. Therefore, we are unable to determine if the specific item findings are a result of the individual question changes implemented together or whether these findings are a result of the presence of all other questionnaire changes made throughout the decade, in particular the considerable reduction in overall white space on the 2010 Census questionnaire. As noted previously, it is imperative to consider the combined effect of all changes to the form when assessing the causal nature of item-level differences.

Table 2 shows response distribution shifts in the Hispanic origin and race questions. For the analysis that follows, Hispanic origin and race responses were considered as a set. That is, if a valid and codeable response was provided in any write-in field across the two questions, that response was placed into its appropriate category. For example, a write-in response of Puerto Rican was included in the Puerto Rican Hispanic origin category and a write-in of Caucasian was included in the White race category, regardless of whether the write-in was reported in a race or Hispanic origin write-in field. Otherwise, all other valid write-in responses that did not map to an existing checkbox category were included in the “other” category (i.e., Another Hispanic, Latino, or Spanish Origin for the Hispanic origin question and Some Other Race for the race question). The Blank/Invalid category refers to cases with an absence of a codeable response in either item.

Table 2. Hispanic Origin and Race Distributions and Differences by Panel

Hispanic Origin Categories	Census 2000 Content	2010 Census Content	Difference (Census 2000 – 2010 Census)
Not of Hispanic, Latino, or Spanish Origin	82.3 (0.22)	81.8 (0.23)	0.5 (0.39)
Yes, Hispanic, Latino, or Spanish Origin	13.9 (0.20)	13.5 (0.20)	0.4 (0.79)
Mexican, Mexican Am., Chicano	6.9 (0.15)	7.8 (0.16)	-0.9 (0.27)*
Puerto Rican	1.4 (0.07)	1.2 (0.06)	0.2 (0.12)
Cuban	0.6 (0.04)	0.7 (0.05)	-0.1 (0.08)
Another Hispanic, Latino, or Spanish Origin	4.8 (0.12)	3.4 (0.11)	1.4 (0.20)*
Two or More Hispanic Origins	0.2 (0.03)	0.4 (0.04)	-0.2 (0.06)*
Blank/Invalid	3.8 (0.11)	4.8 (0.13)	-1.0 (0.21)*
Race Categories			
White	71.3 (0.26)	72.7 (0.26)	-1.4 (0.46)*
Black, African Am., or Negro	10.9 (0.18)	10.8 (0.18)	0.1 (0.32)
American Indian or Alaska Native	0.5 (0.04)	0.5 (0.04)	<0.1 (0.07)
Asian	4.6 (0.12)	5.0 (0.13)	-0.3 (0.22)
Native Hawaiian or Other Pacific Islander	0.1 (0.02)	0.1 (0.02)	<0.1 (0.04)
Some Other Race	6.8 (0.15)	5.2 (0.13)	1.6 (0.24)*
Two or More Races	4.2 (0.12)	4.4 (0.12)	-0.2 (0.21)
Blank/Invalid	1.5 (0.07)	1.3 (0.07)	0.2 (0.12)*

Source: CPEX Sample and Response Files

*Denotes statistically significant difference between panels with an error rate of $\alpha=0.10$.

Before looking at the Hispanic origin response distributions, it is important to note that there was no significant difference across panels in the percent of respondents reporting to be of Hispanic origin. In terms of the response distributions, previous research showed that some of the changes made to the Hispanic origin item resulted in increased specific origin reporting (Sheppard et al., 2004). We saw a similar indication here with a significant increase in reporting of the Mexican, Mexican Am., Chicano checkbox group but a significant decrease in Another Hispanic, Latino, or Spanish Origin for the 2010 Census Content panel, compared to the Census 2000 Content panel. The 2010 Census Content panel also resulted in significantly more reporting of two or more origins. Finally, the 2010 Census Content panel had significantly more blank or invalid Hispanic origin responses than the Census 2000 Content panel. This result was not surprising, considering the 2010 Census Content panel had a significantly higher item nonresponse rate for this item.

There was a significant decrease in responses to Some other race for the 2010 Census Content panel, compared to the Census 2000 Content panel, and a significant increase in reporting in the White category. This is likely a result of the addition to the note above the Hispanic origin question, which tells the respondent that, for this survey, Hispanic origins are not races. We know from previous research that people of Hispanic origin tend to mark the Some Other Race box and write in their Hispanic origin (Humes, 2009). The goal of this addition to the note was to encourage people of Hispanic origin to mark one of the checkbox categories, and not write their origin in the Some Other Race category.

In terms of race distribution differences by Hispanic origin, there was a significant decrease in the proportion of respondents who reported both Hispanic and Some other race, and an increase in Hispanics reporting in the White category. There was also a decrease in blank responses among Hispanics. These results lend support to the inclusion of the “Hispanic origins are not races” instruction, as it has produced the intended result. Among respondents who are not Hispanic, we saw an increase in Asian reporting, which may be a result of the inclusion of examples in the Other Asian category.

In the Census 2000 Content panel, the Hispanic origin response options were double-banked, with the Puerto Rican and Cuban response options appearing to the right of the other options. In the 2010 Census Content panel, all of the Hispanic origin responses were in a single column. It was hypothesized that respondents in the Census 2000 Content panel may have more easily overlooked the Puerto Rican and Cuban response options and thus, would produce fewer responses for those categories when compared to the 2010 Census Content panel. Additionally, the 2010 Census questionnaire provided examples for the “other” Hispanic origin response, while the Census 2000 questionnaire did not. To examine the results of both of these changes, Table 3 presents the response distributions for each of the detailed Hispanic origin categories and differences by panel, for all respondents who indicated they were of Hispanic, Latino, or Spanish origin.

Table 3. Detailed Hispanic Origin Distributions and Differences by Panel

Detailed Hispanic Origin Categories	Census 2000 Content	2010 Census Content	Difference (2000 – 2010)
Total persons identified as Hispanic	15,395	15,299	
“Check box groups”: Hispanic groups with separate check boxes in both questionnaires (sum of 1-3)	64.0 (0.39)	72.1 (0.36)	-8.1 (0.66)*
1 Mexican, Mexican Am., Chicano	49.4 (0.40)	58.0 (0.40)	-8.6 (0.70)*
2 Puerto Rican	10.1 (0.24)	9.2 (0.23)	0.9 (0.42)*
3 Cuban	4.5 (0.17)	5.0 (0.18)	-0.5 (0.30)
“Example Groups”: listed as examples on the 2010 Census (Control) questionnaire but not on Census 2000 Content questionnaire (sum of 4-9)	8.3 (0.22)	11.2 (0.25)	-2.9 (0.42)*
4 Argentinean	0.5 (0.06)	1.0 (0.08)	-0.5 (0.12)*
5 Colombian	1.4 (0.09)	2.0 (0.11)	-0.6 (0.18)*
6 Dominican	3.1 (0.14)	3.2 (0.14)	-0.1 (0.25)
7 Nicaraguan	0.2 (0.04)	0.6 (0.06)	-0.4 (0.09)*
8 Salvadoran	2.8 (0.13)	3.0 (0.14)	-0.2 (0.24)
9 Spaniard	0.2 (0.04)	1.3 (0.09)	-1.1 (0.12)*
All other specific Hispanic groups	8.6 (0.23)	10.5 (0.25)	-1.9 (0.42)*
Write-in is a general descriptor (“Hispanic” / “Latino” / “Spanish”)	12.0 (0.26)	2.9 (0.14)	9.1 (0.37)*
Other Hispanic checkbox without a write-in or a write-in that is uncodable	7.1 (0.21)	3.3 (0.14)	3.8 (0.31)*
Total	100%	100%	

Source: CPEX Sample and Response Files

*Denotes statistically significant difference between panels with an error rate of $\alpha=0.10$.

The 2010 Census Content panel resulted in significantly more responses to the Mexican, Mexican Am., and Chicano checkbox category (a difference of 8.6 percentage points). However, we saw the opposite of our expected result for the Puerto Rican response category. The 2010 Census Content panel had significantly fewer responses to the Puerto Rican category (a difference of 0.9 percentage points). This, along with the absence of an effect on the Cuban responses, was not expected given the placement of those response boxes on the Census 2000-style questionnaire. It is possible that this was due to an unintended effect of the revised layout of the questionnaire. In the Census 2000 Content panel, the Puerto Rican response category extends out past the question stem and may draw the respondent's eye. Additionally, if respondents read across categories, instead of down, Puerto Rican was the first "Yes" response option. Therefore, we may be seeing a primacy effect for the Census 2000 Content panel. In the 2010 Census Content Panel, where respondents were forced to read in a downward direction, the Mexican, Mexican Am., Chicano response category was the first "Yes" response and we saw higher proportions of respondents providing an answer in this category for that panel.

There was also an increase in reporting of the example groups in the 2010 Census Content panel (a difference of 2.9 percentage points). This is most likely due to listing the example groups as examples on the 2010 Census questionnaire but not on the Census 2000-style questionnaire. There was a 1.9 percentage point increase in respondents reporting specific Hispanic origin groups not listed as examples in the 2010 Census Content panel, compared to the Census 2000 Content panel. Again, the presence of examples on the 2010 Census form is likely to have prompted respondents to write in specific examples instead of just checking the "other" checkbox.

The 2010 Census Content panel saw a significant decrease in general descriptor write-ins such as Hispanic, Latino, or Spanish (a difference of 9.1 percentage points). As supported by previous research, it is likely that the inclusion of examples on the 2010 Census form helped provide context to respondents as to what we meant by "other" Hispanic origins. We also saw a 3.8 percentage point decrease in responses to the "other" Hispanic checkbox that either did not have a write-in or had a write-in that was uncodeable, which is also encouraging. This means that respondents who checked "Yes, another Hispanic, Latino, or Spanish origin" provided valid write-ins more often for the 2010 Census Content panel than the Census 2000 Content panel.

In summary, the changes to the Hispanic origin item resulted in: more responses to the checkbox groups; more write-ins of the example groups; fewer write-ins that were general descriptors; and fewer "other" Hispanic responses that were not accompanied by a valid write-in. All of these results were expected, given the mid-decade testing that occurred. It is encouraging that these findings held in the presence of all other changes made to the questionnaire throughout the decade.

5. Conclusions and Recommendations

Upon close review of the 2010 Census form, it is clear that it violates a few principles from a body of survey research on visual design and layout for self-administered questionnaires. One principle of visual design is the identification of a clear starting point. Although the 2010 Census questionnaire maintained the use of the words "Start here," it was smaller and less prominent than on the Census 2000-style questionnaire. In addition, the first question on the Census 2000-style questionnaire immediately followed the "Start here" instruction while the "Start here" on the 2010 Census questionnaire was

immediately followed by lengthy instructions, thereby pushing the first question halfway down the page. Therefore, we believe that the starting point on the 2010 Census questionnaire was not as clear as it was on the 2000 Census-style form, which may have resulted in higher item nonresponse to the first question. Visual design principles also assert that an extra blank line should be inserted between questions to ensure more space between questions than between question sub-elements. This was done on the Census 2000-style questionnaire but was not possible on the 2010 Census questionnaire, due to lengthier content.

The violation of these principles contributed to an overall cluttered look and reduction in white space on the 2010 Census questionnaire. Research supports the theory that the visual design of a self-administered questionnaire can significantly impact response behavior and contribute to a respondent's perception of burden (Dillman, 2000; Sudman and Bradburn, 1982). Therefore, we believe this may have been an over-arching factor in the lower overall return rates and higher item nonresponse rates for some items on the 2010 Census Content panel compared to the Census 2000 Content panel. In summary, the crowded look of the 2010 Census questionnaire may have caused some respondents to be less willing to complete it.

We recommend considering an alternative form design to achieve an increase in white space on the form. The method used to gain the increase in white space must be considered in terms of a cost to benefit ratio. For example, if a larger form is deemed necessary, that larger form will likely cost more to produce and mail. The increased cost in production will need to be weighed against potential savings in nonresponse followup costs (due to the potential gains in mail return rates) to determine the overall impact.

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Appendix

Example of the Control Panel (2010 Census) Questionnaire – Page 1

**United States
Census
2010**

This is the official form for all the people at this address.
It is quick and easy, and your answers are protected by law.

U.S. DEPARTMENT OF COMMERCE
Economics and Statistics Administration
U.S. CENSUS BUREAU

Use a blue or black pen.

Start here

The Census must count every person living in the United States on April 1, 2010.

Before you answer Question 1, count the people living in this house, apartment, or mobile home using our guidelines.

- Count all people, including babies, who live and sleep here most of the time.

The Census Bureau also conducts counts in institutions and other places, so:

- Do not count anyone living away either at college or in the Armed Forces.
- Do not count anyone in a nursing home, jail, prison, detention facility, etc., on April 1, 2010.
- Leave these people off your form, even if they will return to live here after they leave college, the nursing home, the military, jail, etc. Otherwise, they may be counted twice.

The Census must also include people without a permanent place to stay, so:

- If someone who has no permanent place to stay is staying here on April 1, 2010, count that person. Otherwise, he or she may be missed in the census.

1. How many people were living or staying in this house, apartment, or mobile home on April 1, 2010?

Number of people =

2. Were there any additional people staying here April 1, 2010 that you did not include in Question 1? Mark all that apply.

Children, such as newborn babies or foster children

Relatives, such as adult children, cousins, or in-laws

Nonrelatives, such as roommates or live-in baby sitters

People staying here temporarily

No additional people

3. Is this house, apartment, or mobile home — Mark ONE box.

Owned by you or someone in this household with a mortgage or loan? *Include home equity loans.*

Owned by you or someone in this household free and clear (without a mortgage or loan)?

Rented?

Occupied without payment of rent?

4. What is your telephone number? We may call if we don't understand an answer.

Area Code + Number

- -

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5. Please provide information for each person living here. Start with a person living here who owns or rents this house, apartment, or mobile home. If the owner or renter lives somewhere else, start with any adult living here. This will be Person 1.

What is Person 1's name? *Print name below.*

Last Name

First Name MI

6. What is Person 1's sex? Mark ONE box.

Male Female

7. What is Person 1's age and what is Person 1's date of birth? Please report babies as age 0 when the child is less than 1 year old. Print numbers in boxes.

Age on April 1, 2010 Month Day Year of birth

→ **NOTE: Please answer BOTH Question 8 about Hispanic origin and Question 9 about race. For this census, Hispanic origins are not races.**

8. Is Person 1 of Hispanic, Latino, or Spanish origin?

No, not of Hispanic, Latino, or Spanish origin

Yes, Mexican, Mexican Am., Chicano

Yes, Puerto Rican

Yes, Cuban

Yes, another Hispanic, Latino, or Spanish origin — *Print origin, for example, Argentinean, Colombian, Dominican, Nicaraguan, Salvadoran, Spaniard, and so on.* ↴

9. What is Person 1's race? Mark one or more boxes.

White

Black, African Am., or Negro

American Indian or Alaska Native — *Print name of enrolled or principal tribe.* ↴

Asian Indian Japanese Native Hawaiian

Chinese Korean Guamanian or Chamorro

Filipino Vietnamese Samoan

Other Asian — *Print race, for example, Hmong, Laotian, Thai, Pakistani, Cambodian, and so on.* ↴

Other Pacific Islander — *Print race, for example, Fijian, Tongan, and so on.* ↴

Some other race — *Print race.* ↴

10. Does Person 1 sometimes live or stay somewhere else?

No Yes — *Mark all that apply.*

In college housing For child custody

In the military In jail or prison

At a seasonal or second residence In a nursing home

For another reason


→ If more people were counted in Question 1, continue with Person 2.

U S C E N S U S B U R E A U

Example of the Control Panel (2010 Census) Questionnaire – Page 2

<p>1. Print name of Person 2</p> <p>Last Name <input type="text"/></p> <p>First Name <input type="text"/> MI <input type="checkbox"/></p> <p>2. How is this person related to Person 1? Mark <input checked="" type="checkbox"/> ONE box.</p> <p><input type="checkbox"/> Husband or wife <input type="checkbox"/> Parent-in-law <input type="checkbox"/> Biological son or daughter <input type="checkbox"/> Son-in-law or daughter-in-law <input type="checkbox"/> Adopted son or daughter <input type="checkbox"/> Other relative <input type="checkbox"/> Stepson or stepdaughter <input type="checkbox"/> Roomer or boarder <input type="checkbox"/> Brother or sister <input type="checkbox"/> Housemate or roommate <input type="checkbox"/> Father or mother <input type="checkbox"/> Unmarried partner <input type="checkbox"/> Grandchild <input type="checkbox"/> Other nonrelative</p> <p>3. What is this person's sex? Mark <input checked="" type="checkbox"/> ONE box.</p> <p><input type="checkbox"/> Male <input type="checkbox"/> Female</p> <p>4. What is this person's age and what is this person's date of birth? <i>Please report babies as age 0 when the child is less than 1 year old.</i> <i>Print numbers in boxes.</i></p> <p>Age on April 1, 2010 Month Day Year of birth</p> <p><input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/></p> <p>→ NOTE: Please answer BOTH Question 5 about Hispanic origin and Question 6 about race. For this census, Hispanic origins are not races.</p> <p>5. Is this person of Hispanic, Latino, or Spanish origin?</p> <p><input type="checkbox"/> No, not of Hispanic, Latino, or Spanish origin <input type="checkbox"/> Yes, Mexican, Mexican Am., Chicano <input type="checkbox"/> Yes, Puerto Rican <input type="checkbox"/> Yes, Cuban <input type="checkbox"/> Yes, another Hispanic, Latino, or Spanish origin — <i>Print origin, for example, Argentinian, Colombian, Dominican, Nicaraguan, Salvadoran, Spaniard, and so on.</i> ↕</p> <p><input type="text"/></p> <p>6. What is this person's race? Mark <input checked="" type="checkbox"/> one or more boxes.</p> <p><input type="checkbox"/> White <input type="checkbox"/> Black, African Am., or Negro <input type="checkbox"/> American Indian or Alaska Native — <i>Print name of enrolled or principal tribe.</i> ↕</p> <p><input type="text"/></p> <p><input type="checkbox"/> Asian Indian <input type="checkbox"/> Japanese <input type="checkbox"/> Native Hawaiian <input type="checkbox"/> Chinese <input type="checkbox"/> Korean <input type="checkbox"/> Guamanian or Chamorro <input type="checkbox"/> Filipino <input type="checkbox"/> Vietnamese <input type="checkbox"/> Samoan <input type="checkbox"/> Other Asian — <i>Print race, for example, Hmong, Laotian, Thai, Pakistani, Cambodian, and so on.</i> ↕ <input type="checkbox"/> Other Pacific Islander — <i>Print race, for example, Fijian, Tongan, and so on.</i> ↕</p> <p><input type="text"/></p> <p><input type="checkbox"/> Some other race — <i>Print race.</i> ↕</p> <p><input type="text"/></p> <p>7. Does this person sometimes live or stay somewhere else?</p> <p><input type="checkbox"/> No <input type="checkbox"/> Yes — <i>Mark <input checked="" type="checkbox"/> all that apply.</i></p> <p><input type="checkbox"/> In college housing <input type="checkbox"/> For child custody <input type="checkbox"/> In the military <input type="checkbox"/> In jail or prison <input type="checkbox"/> At a seasonal or second residence <input type="checkbox"/> In a nursing home <input type="checkbox"/> For another reason</p> <p>→ If more people were counted in Question 1 on the front page, continue with Person 3.</p>	<p>1. Print name of Person 3</p> <p>Last Name <input type="text"/></p> <p>First Name <input type="text"/> MI <input type="checkbox"/></p> <p>2. How is this person related to Person 1? Mark <input checked="" type="checkbox"/> ONE box.</p> <p><input type="checkbox"/> Husband or wife <input type="checkbox"/> Parent-in-law <input type="checkbox"/> Biological son or daughter <input type="checkbox"/> Son-in-law or daughter-in-law <input type="checkbox"/> Adopted son or daughter <input type="checkbox"/> Other relative <input type="checkbox"/> Stepson or stepdaughter <input type="checkbox"/> Roomer or boarder <input type="checkbox"/> Brother or sister <input type="checkbox"/> Housemate or roommate <input type="checkbox"/> Father or mother <input type="checkbox"/> Unmarried partner <input type="checkbox"/> Grandchild <input type="checkbox"/> Other nonrelative</p> <p>3. What is this person's sex? Mark <input checked="" type="checkbox"/> ONE box.</p> <p><input type="checkbox"/> Male <input type="checkbox"/> Female</p> <p>4. What is this person's age and what is this person's date of birth? <i>Please report babies as age 0 when the child is less than 1 year old.</i> <i>Print numbers in boxes.</i></p> <p>Age on April 1, 2010 Month Day Year of birth</p> <p><input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/></p> <p>→ NOTE: Please answer BOTH Question 5 about Hispanic origin and Question 6 about race. For this census, Hispanic origins are not races.</p> <p>5. Is this person of Hispanic, Latino, or Spanish origin?</p> <p><input type="checkbox"/> No, not of Hispanic, Latino, or Spanish origin <input type="checkbox"/> Yes, Mexican, Mexican Am., Chicano <input type="checkbox"/> Yes, Puerto Rican <input type="checkbox"/> Yes, Cuban <input type="checkbox"/> Yes, another Hispanic, Latino, or Spanish origin — <i>Print origin, for example, Argentinian, Colombian, Dominican, Nicaraguan, Salvadoran, Spaniard, and so on.</i> ↕</p> <p><input type="text"/></p> <p>6. What is this person's race? Mark <input checked="" type="checkbox"/> one or more boxes.</p> <p><input type="checkbox"/> White <input type="checkbox"/> Black, African Am., or Negro <input type="checkbox"/> American Indian or Alaska Native — <i>Print name of enrolled or principal tribe.</i> ↕</p> <p><input type="text"/></p> <p><input type="checkbox"/> Asian Indian <input type="checkbox"/> Japanese <input type="checkbox"/> Native Hawaiian <input type="checkbox"/> Chinese <input type="checkbox"/> Korean <input type="checkbox"/> Guamanian or Chamorro <input type="checkbox"/> Filipino <input type="checkbox"/> Vietnamese <input type="checkbox"/> Samoan <input type="checkbox"/> Other Asian — <i>Print race, for example, Hmong, Laotian, Thai, Pakistani, Cambodian, and so on.</i> ↕ <input type="checkbox"/> Other Pacific Islander — <i>Print race, for example, Fijian, Tongan, and so on.</i> ↕</p> <p><input type="text"/></p> <p><input type="checkbox"/> Some other race — <i>Print race.</i> ↕</p> <p><input type="text"/></p> <p>7. Does this person sometimes live or stay somewhere else?</p> <p><input type="checkbox"/> No <input type="checkbox"/> Yes — <i>Mark <input checked="" type="checkbox"/> all that apply.</i></p> <p><input type="checkbox"/> In college housing <input type="checkbox"/> For child custody <input type="checkbox"/> In the military <input type="checkbox"/> In jail or prison <input type="checkbox"/> At a seasonal or second residence <input type="checkbox"/> In a nursing home <input type="checkbox"/> For another reason</p> <p>→ If more people were counted in Question 1 on the front page, continue with Person 4.</p>
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Example of the Census 2000 Panel Questionnaire – Page 1



**United States
Census
2010**

This is the official form for all the people at this address. It is quick and easy, and your answers are protected by law. Complete the Census and help your community get what it needs - today and in the future.

U.S. DEPARTMENT OF COMMERCE
Economics and Statistics Administration
U.S. CENSUS BUREAU

Start Here Please use a black or blue pen.

1. How many people were living or staying in this house, apartment, or mobile home on April 1, 2010?

Number of people

INCLUDE in this number:

- foster children, roomers, or housemates
- people staying here on April 1, 2010 who have no other permanent place to stay.
- people living here most of the time while working, even if they have another place to live

DO NOT INCLUDE in this number:

- college students living away while attending college
- people in a correctional facility, nursing home, or mental hospital on April 1, 2010
- Armed Forces personnel living somewhere else
- people who live or stay at another place most of the time

2. Is this house, apartment, or mobile home —
Mark ONE box.

Owned by you or someone in this household with a mortgage or loan?

Owned by you or someone in this household free and clear (without a mortgage or loan)?

Rented for cash rent?

Occupied without payment of cash rent?

3. Please answer the following questions for each person living in this house, apartment, or mobile home. Start with the name of one of the people living here who owns, is buying, or rents this house, apartment, or mobile home. If there is no such person, start with any adult living or staying here. We will refer to this person as Person 1.

What is this person's name? Print name below.

Last Name

First Name MI

4. What is Person 1's telephone number? We may call this person if we don't understand an answer.

Area Code + Number - -

5. What is Person 1's sex? Mark ONE box.

Male Female

6. What is Person 1's age and what is Person 1's date of birth?

Age on April 1, 2010

Print numbers in boxes.

Month Day Year of birth

→ **NOTE: Please answer BOTH Questions 7 and 8.**

7. Is Person 1 Spanish/Hispanic/Latino? Mark the "No" box if not Spanish/Hispanic/Latino.

No, not Spanish/Hispanic/Latino Yes, Puerto Rican

Yes, Mexican, Mexican Am., Chicano Yes, Cuban

Yes, other Spanish/Hispanic/Latino — *Print group.*

8. What is Person 1's race? Mark one or more races to indicate what this person considers himself/herself to be.

White

Black, African Am., or Negro

American Indian or Alaska Native — *Print name of enrolled or principal tribe.*

Asian Indian Japanese Native Hawaiian

Chinese Korean Guamanian or Chamorro

Filipino Vietnamese Samoan

Other Asian — *Print race.* Other Pacific Islander — *Print race.*

Some other race — *Print race.*

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→ If more people live here, continue with Person 2.

Form D-1(X1) (7-23-2009)

U S C E N S U S B U R E A U

Example of the Census 2000 Panel Questionnaire – Page 2

Person 2

Your answers are important!
Every person in the Census counts.

1. What is Person 2's name? Print name below.

Last Name

First Name MI

2. How is this person related to Person 1? Mark ONE box.

<input type="checkbox"/> Husband/wife	If NOT RELATED to Person 1:
<input type="checkbox"/> Natural-born son/daughter	<input type="checkbox"/> Roomer, boarder
<input type="checkbox"/> Adopted son/daughter	<input type="checkbox"/> Housemate, roommate
<input type="checkbox"/> Stepson/stepdaughter	<input type="checkbox"/> Unmarried partner
<input type="checkbox"/> Brother/sister	<input type="checkbox"/> Foster child
<input type="checkbox"/> Father/mother	<input type="checkbox"/> Other nonrelative
<input type="checkbox"/> Grandchild	
<input type="checkbox"/> Parent-in-law	
<input type="checkbox"/> Son-in-law/daughter-in-law	
<input type="checkbox"/> Other relative — Print exact relationship. → <input style="width: 80px;" type="text"/>	

3. What is this person's sex? Mark ONE box.

Male Female

4. What is this person's age and what is this person's date of birth?
Print numbers in boxes.

Age on April 1, 2010 Month Day Year of birth

→ NOTE: Please answer BOTH Questions 5 and 6.

5. Is this person Spanish/Hispanic/Latino? Mark the "No" box if not Spanish/Hispanic/Latino.

<input type="checkbox"/> No, not Spanish/Hispanic/Latino	<input type="checkbox"/> Yes, Puerto Rican
<input type="checkbox"/> Yes, Mexican, Mexican Am., Chicano	<input type="checkbox"/> Yes, Cuban
<input type="checkbox"/> Yes, other Spanish/Hispanic/Latino — Print group. ↴	

6. What is this person's race? Mark one or more races to indicate what this person considers himself/herself to be.

<input type="checkbox"/> White	
<input type="checkbox"/> Black, African Am., or Negro	
<input type="checkbox"/> American Indian or Alaska Native — Print name of enrolled or principal tribe. ↴	

<input type="checkbox"/> Asian Indian	<input type="checkbox"/> Japanese	<input type="checkbox"/> Native Hawaiian
<input type="checkbox"/> Chinese	<input type="checkbox"/> Korean	<input type="checkbox"/> Guamanian or Chamorro
<input type="checkbox"/> Filipino	<input type="checkbox"/> Vietnamese	<input type="checkbox"/> Samoan
<input type="checkbox"/> Other Asian — Print race. ↴	<input type="checkbox"/> Other Pacific Islander — Print race. ↴	

Some other race — Print race. ↴

→ If more people live here, continue with Person 3.

Person 3

Census information helps your community get financial assistance for roads, hospitals, schools, and more.

1. What is Person 3's name? Print name below.

Last Name

First Name MI

2. How is this person related to Person 1? Mark ONE box.

<input type="checkbox"/> Husband/wife	If NOT RELATED to Person 1:
<input type="checkbox"/> Natural-born son/daughter	<input type="checkbox"/> Roomer, boarder
<input type="checkbox"/> Adopted son/daughter	<input type="checkbox"/> Housemate, roommate
<input type="checkbox"/> Stepson/stepdaughter	<input type="checkbox"/> Unmarried partner
<input type="checkbox"/> Brother/sister	<input type="checkbox"/> Foster child
<input type="checkbox"/> Father/mother	<input type="checkbox"/> Other nonrelative
<input type="checkbox"/> Grandchild	
<input type="checkbox"/> Parent-in-law	
<input type="checkbox"/> Son-in-law/daughter-in-law	
<input type="checkbox"/> Other relative — Print exact relationship. → <input style="width: 80px;" type="text"/>	

3. What is this person's sex? Mark ONE box.

Male Female

4. What is this person's age and what is this person's date of birth?
Print numbers in boxes.

Age on April 1, 2010 Month Day Year of birth

→ NOTE: Please answer BOTH Questions 5 and 6.

5. Is this person Spanish/Hispanic/Latino? Mark the "No" box if not Spanish/Hispanic/Latino.

<input type="checkbox"/> No, not Spanish/Hispanic/Latino	<input type="checkbox"/> Yes, Puerto Rican
<input type="checkbox"/> Yes, Mexican, Mexican Am., Chicano	<input type="checkbox"/> Yes, Cuban
<input type="checkbox"/> Yes, other Spanish/Hispanic/Latino — Print group. ↴	

6. What is this person's race? Mark one or more races to indicate what this person considers himself/herself to be.

<input type="checkbox"/> White	
<input type="checkbox"/> Black, African Am., or Negro	
<input type="checkbox"/> American Indian or Alaska Native — Print name of enrolled or principal tribe. ↴	

<input type="checkbox"/> Asian Indian	<input type="checkbox"/> Japanese	<input type="checkbox"/> Native Hawaiian
<input type="checkbox"/> Chinese	<input type="checkbox"/> Korean	<input type="checkbox"/> Guamanian or Chamorro
<input type="checkbox"/> Filipino	<input type="checkbox"/> Vietnamese	<input type="checkbox"/> Samoan
<input type="checkbox"/> Other Asian — Print race. ↴	<input type="checkbox"/> Other Pacific Islander — Print race. ↴	

Some other race — Print race. ↴

→ If more people live here, continue with Person 4.