

Census 2000 Content Reinterview Survey: Accuracy of Data for Selected Population and Housing Characteristics as Measured by Reinterview

FINAL REPORT

This evaluation reports the results of research and analysis undertaken by the U.S. Census Bureau. It is part of a broad program, the Census 2000 Testing, Experimentation, and Evaluation (TXE) Program, designed to assess Census 2000 and to inform 2010 Census planning. Findings from the Census 2000 TXE Program reports are integrated into topic reports that provide context and background for broader interpretation of results.

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

Helping You Make Informed Decisions

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EXECUTIVE SUMMARY

The Content Reinterview Survey was designed to evaluate the consistency of responses to Census 2000 questionnaire. Understanding the accuracy and reliability of census data aids both data users and census planners. Data users need to determine how errors in the data might affect the conclusions they draw from analyzing census data. Census planners use measures of consistency to develop and test methods to improve the quality of future censuses.

Previous content reinterview surveys attempted to evaluate both response variance (the variation in responses over repeated questioning) and bias. In 2000, response variance only was studied. To reduce cost and the burden to respondents, the 2000 Content Reinterview Survey asked population questions (age, sex, marital status, etc.) about only one sample person per household, who was randomly chosen from a roster for each unit that was collected at the beginning of the content reinterview survey.

Prior to Census 2000, 30,000 households that were initially selected to receive the census long-form questionnaire were randomly selected as potential participants in the Content Reinterview Survey. After a household returned the census questionnaire, it became eligible to participate in the reinterview survey. Experienced census field representatives called the selected households to re-ask most of the census long-form questions. Personal visit interviews were allowed if the households could not be reached by telephone.

For the Content Reinterview Survey, we were able to analyze data from about 20,000 of the preselected households. Around three-quarters of the cases analyzed had completed the mailback forms for Census 2000. About three-fifths of all preselected reinterview households completed Census 2000 mailback forms, which is close to the proportion for Census 2000.

Since the Content Reinterview Survey was conducted by enumerators who used either telephone interviews (the primary method) or personal visits, collection mode for the reinterview survey was different from that of the census in the majority of analyzed cases. Mailed-back census responses are over-represented in this reinterview analysis. Census data collected from mailed forms are usually less inconsistent than census data collected by enumerators^a. Respondents who mailed the census form may have been easier to contact, more compliant respondents, and more willing to give thoughtful responses than other respondents.

Based on data collected in the census and the reinterview survey, analysts computed the index of inconsistency - a measure to detect response variance - and used it to evaluate the consistency of each item at the national level. A high index of inconsistency (50 or more) for a question indicated that the question was problematic because the data elicited by the question was not consistent. A low index (below 20) indicated that the data elicited by the question was probably consistent. A moderate index (20 up to 50) indicated that the question was somewhat problematic. To improve the quality of future data collection, the Census Bureau will focus its

^aBushery, John M., Brick, J. Michael, Severynse, Jacqueline, and McGuinness, Richard A. (1996). "How interview mode affects data reliability," Proceedings of the Section on Survey Research Methods, American Statistical Association, pp 600-604.

attention on Content Reinterview Survey items with high indexes on inconsistency.

Our key findings and recommendations follow. To compare two subgroups we used the Wilcoxon matched-pair signed-rank test. To compare individual questions we used z-tests. The tests were significant if the z-value was greater than 1.282 (or less than -1.282).

How consistent were census long-form data for population characteristics?

Of the 58 population characteristics evaluated by the Content Reinterview Survey, 16 showed low inconsistency, 26 showed moderate inconsistency, and 16 showed high inconsistency. The items that showed low inconsistency included:

- questions about sex, age, Hispanic origin, and marital status,
- questions about school attendance,
- questions about language spoken at home,
- questions about place of birth, citizenship, year of entry to the U.S., and
- questions about veteran status and period of military service.

The items that showed high inconsistency included:

- questions about language usage,
- questions about disability,
- questions about grandparents as caregivers,
- questions about work experience in 1999, and
- questions about income.

The income-amount questions that exhibited high inconsistency had some rare response categories (less than 5 percent of all responses are in a rare response category). When a response category is rare, then any inconsistencies, discrepancies, or differences between the census and reinterview have a disproportionate effect on the index of inconsistency.

Reinterview responses to questions about language usage, disability with self-care limitation, and weeks worked showed high inconsistency in both 1990 and 2000. Responses to questions about disability with mobility limitations and work disabilities showed moderate inconsistency in 1990 but high inconsistency in 2000.

Comparing problematic questions from Census 2000 to other surveys was more difficult. For example, the Current Population Survey Income Supplement^b asked much more detailed questions about types of income and bundled types of income differently than the census did. The Current Population Survey analyzed income amounts and weeks worked as continuous variables, whereas this reinterview study used categorical variables. Questions about type of income included the option “Don’t know” on the Current Population Survey but not on the

^bKindelberger, John C. (1999). "Response Variance in the March 1998 Current Population Survey Income Supplement," Internal U.S. Census Bureau report, pp B-3 through B-45.

Content Reinterview Survey.

Did the Hispanic-origin and race questions provide consistent data?

With both census and reinterview data we performed minimal editing for both the Hispanic-origin and race questions prior to analysis. The edited data for the Hispanic-origin question displayed low inconsistency. No instructions were provided to the respondents for the Hispanic-origin question. Although respondents were expected to choose only one category for this question, several respondents chose multiple categories. All responses, including write-ins, to the Hispanic-origin question in both the census and reinterview were captured and coded.

Analysis of the edited data for the Hispanic-origin question by census collection type indicated that respondents who reported on mailback forms and respondents who reported to enumerators showed low inconsistency. The indexes were not significantly different at the 90-percent confidence level.

The race question allowed respondents to choose one or more races from the response categories. As with the Hispanic-origin data, we captured all responses to the race question, coded responses to the question, and performed minimal editing prior to analysis. The edited race data displayed moderate inconsistency.

The “Some other race” category was collected as a write-in entry in both the census and the reinterview. Analysis of these write-in entries indicated that the majority of people in this category were of Hispanic origin. Over two-thirds (68.8 to 73.2 percent) of the sample persons reported as “Some other race” in either the census or the Content Reinterview Survey were also reported to be of Hispanic origin in the corresponding interview. It is apparent that many Hispanics do not relate to the categories in the race question.

Analysis of the edited race data by Hispanic origin showed that, at the 90-percent confidence level, households with non-Hispanic sample persons showed less inconsistency than households with Hispanic sample persons ($z = 16.5$). This suggests that the Hispanic population contributes greatly to the response variance of the race data.

The edited data for the race question, analyzed by census collection type, revealed that respondents who reported on mailback forms showed less inconsistency than respondents who reported to enumerators, although the inconsistency level for both was moderate.

How consistent were census long-form data for housing characteristics?

Of the 36 housing characteristic items measured, 5 showed low inconsistency, 15 showed moderate inconsistency, and 16 showed high inconsistency. The items with low inconsistency included:

- the question about the number of people in the household,
- the question about whether the unit was owned or rented,
- the question about heating fuel,

- the question asking whether there was a mortgage on the property, and
- the question asking if real estate taxes were included in the mortgage payment.

The items with high inconsistency included:

- questions about utility costs for gas and for electricity,
- questions about second mortgages and home equity loans,
- questions about loans on mobile homes,
- questions about the value of the property and insurance costs for the property,
- the question about the number of rooms in the house/apartment/mobile home,
- questions about whether there was a business at the site and the total value of agricultural sales for the property, and
- questions about plumbing facilities, kitchen facilities, and telephone service.

The last set of questions (plumbing, kitchen, telephone) exhibited high inconsistency mainly because it was so rare not to have complete facilities or service. When a response is rare (less than 5 percent of all responses), then any inconsistencies, discrepancies, or differences between the census and the content reinterview survey have a disproportionate effect on the index of inconsistency.

We compared the consistency of responses to problematic questions from Census 2000 with the corresponding items on the 1990 and 1980 censuses. The questions about businesses on site and about agricultural sales showed moderate inconsistency in 1980 and 1990. The question about plumbing facilities also showed high inconsistency in 1990. Comparing problematic questions from Census 2000 with the responses on national surveys was more difficult. For example, the American Housing Survey^c asked about monthly utility costs (rather than annual costs) and analyzed it with a different number of categories than were analyzed on Census 2000.

How consistent were census long-form data by census collection type?

At the 90-percent confidence level, census data collected by mailed return (mailback) generally showed less inconsistency than enumerator-collected data ($z = 7.1$). These data may be biased. As mentioned earlier, previous researchers indicated that data collected by mail is more consistent than data collected by enumerators.

Inconsistency levels by census collection type are shown in Table A, below.

^cFeindt, Patricia J. (1994). "Response Variance in the 1989 American Housing Survey," Internal U.S. Census Bureau report.

Table A. Inconsistency levels by census collection type

Census collection type	Low	Moderate	High	Unstable, undefined, or insufficient data to calculate
Enumerator	12	35	40	7
Mailback	26	36	31	1

Sufficient data were gathered to compare indexes of inconsistency by collection type for 87 items. At the 90-percent confidence level, 51 showed less inconsistency for mailback forms and 2 showed less inconsistency for enumerator forms. The two that were less inconsistent when collected by enumerators were:

- Do you speak a language other than English at home?
- What is the annual cost for Gas?

How consistent were census long-form data by respondent type?

At the 90-percent confidence level, data collected from the same respondent on the Content Reinterview Survey as on Census 2000 were generally less inconsistent than data collected from different respondents ($z = 4.8$).

Inconsistency levels by respondent type are shown in Table B, below. This table does not include race or Hispanic-origin data.

Table B. Inconsistency levels by respondent type

Respondent type	Low	Moderate	High	Unstable, undefined, or insufficient data to calculate
Same respondent	25	36	32	0
Different respondent	15	40	32	6

Of the 87 items tested, 47 showed less inconsistency for the same respondent than for a different respondent. Data from different respondents were never less inconsistent (at the 90-percent confidence level) than data supplied by the same respondent.

How did the inconsistency in 2000 compare to the inconsistency in 1990?

This issue was complicated because only a response variance study was conducted in 2000. We compared the aggregate index of inconsistency for 28 items for 1990 and 2000. The Wilcoxon matched-pair signed-rank test showed, at the 90-percent confidence level, that the overall inconsistency for 1990 and 2000 was not significantly different ($z = 0.5$). The aggregate inconsistency for the individual questions was compared with z-tests, revealing that 11 questions had a significantly smaller aggregate index of inconsistency in 2000 than in 1990 and that 13 questions had a significantly larger aggregate index of inconsistency in 2000 than in 1990. Of those 13 questions, 10 had the same inconsistency level (low, moderate, or high) in both decades.

Our key recommendations follow.

- **Use cognitive experts to recommend improvements to problematic questions. Evaluate new and revised questions in content reinterview surveys of the American Community Survey and the 2010 census to determine if reliability has been improved.**
- **Plan the content reinterview surveys of the 2010 census and the American Community Survey as early as possible, preferably not as add-ons.** In this way, the content reinterview program can be used to systematically evaluate and improve the American Community Survey.
- **Use results from content tests in developing questionnaires for the 2010 census and the American Community Survey. Document decisions that contradict suggestions based on the content tests.**
- **To the extent possible, use the same data collection modes, data capture methods and hardware/software, data processing procedures, and enumerators for both the 2010 census and its content reinterview, and for both the American Community Survey and its content reinterview.** Although it would be desirable to have the same data collection mode for either survey and its interview (e.g., phone reinterview for phone original, internet reinterview for internet original), it might be impractical logistically.
- **Know the data capture error rates (and do what is necessary to lower them) prior to data collection for the American Community Survey and the 2010 census.** This type of quality assurance needs to be part of the system.
- **Provide better instructions on the 2010 census and the American Community Survey for the Hispanic-origin question.** Lack of instructions adversely affected the Hispanic-origin question in 2000, since the question did not specify if the respondent was to mark one category or all that apply. Several respondents did the latter.
- **Use separate “Yes/No” questions for each response category of “mark all that apply” questions.** Previous work^d has shown that the “mark all” format leads to questionable data.
- **For time-sensitive questions, refer to the date of the original survey in the content reinterview, for both the American Community Survey and the 2010 census.** The

^dRasinski, K., Mingay, D., Bradburn, N. (1994). “Do Respondents Really ‘Mark All that Apply’ on Self-Administered Questions,” *Public Opinion Quarterly* 58:400-408.

Bushery, J., Royce, D., Kasprzyk, D. (1992). “The Schools and Staffing Survey: How reinterview measures data quality,” Proceedings of the Section on Survey Research Methods, American Statistical Association.

question about telephone service, associated with the rare population of households in the United States that do not have telephone service, is both time-sensitive and problematic. Time-sensitive questions need to have better time reference. Although the respondent might still answer the questions using the date of the reinterview survey as the reference date, time reference in the questions might clear up some of the variation in response.

- **Conduct the content reinterview surveys of the American Community Survey and the 2010 census within three or four weeks of completing the original data collection.**
- **Create a database linking all changes to Master Address File identifiers.** With a single database of identifier changes, the content reinterview survey of either American Community Survey or the 2010 census could proceed more quickly and accurately than the Content Reinterview Survey did in 2000. For example, the identifiers for some cases changed before we conducted the Content Reinterview Survey in 2000, causing delays in analysis and the possible loss of some cases for analysis.

In addition to these recommendations for the American Community Survey and the 2010 census, our recommendations for future research on the Content Reinterview Survey for Census 2000 include:

- **Analyze inconsistency by time lag between the Content Reinterview Survey and Census 2000.** This would help determine how much inconsistency in key questions is inherent to the questions and how much inconsistency is due to time lag.
- **Determine the characteristics related to high inconsistency and then do a multivariate analysis (of key questions) with respect to those characteristics.** After determining characteristics related to the high inconsistency of particular questions, the multivariate analysis would indicate how those characteristics affect response variance for those questions.
- **Analyze inconsistency in response to questions on plumbing facilities, kitchen facilities, and telephone service by the value of the property.**

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1. INTRODUCTION AND BACKGROUND

1.1 Why do the CRS?

The evaluation of the quality of data collected in the 2000 Census of Population and Housing is important for both data users and census planners. Data users must have knowledge of the accuracy and reliability of the data in order to make informed decisions about how errors in the data may affect the conclusions they draw from analyzing the data. Census planners require similar information to develop and test methods to improve the overall quality of the data produced in future censuses. Content reinterview surveys (CRSs) aid in these goals.

1.2 Background

The methods used to collect and process census data are complex and often subject to error. One particular type of error, response error, arises from the erroneous or unreliable reporting of characteristics. Response error in the decennial census has traditionally been measured through content reinterview surveys.

The Census Bureau first began conducting a census CRS for the 1950 census, and continued to conduct one for each of the following censuses. The purposes of the content reinterview studies were twofold. First, they were used to provide information on the quality of the data, to assist data users in interpreting the results. Second, they were used to provide information to improve future data collection. The CRS is the largest content evaluation study conducted by the Census Bureau.

Previous content reinterview surveys attempted to measure both simple response variance and response bias. Response variance measures the variation in respondents' answers to a question when the question is asked repeatedly. Response bias measures a systematic pattern in the difference between respondents' answers and the correct response.

To measure response variance, CRSs attempted to re-ask the same set of questions applying the same survey procedures and, to the greatest extent possible, replicating the same set of conditions. A more detailed set of probing questions, however, was included for specific items in an attempt to measure response bias in previous decades. This set of detailed probes was thought to gather data with a higher degree of accuracy than was possible in the census questionnaire.

1.3 Overview of CRS 2000

The objective of the 2000 Content Reinterview Survey was to evaluate the quality of the population and housing data collected during Census 2000. We used test-retest methodology. The primary evaluation measure was simple response variance, measured by the index of inconsistency. We did not measure response bias. The index of inconsistency was meant to capture those errors introduced by erroneous or unreliable reporting of the characteristics. Our estimate of the index of inconsistency also included those errors introduced by both the actual collection and the capture of the data.

Approximately one in six households was designated to receive the long form for Census 2000. Prior to the census, the Census Bureau selected a sample of those housing units for reinterview purposes. During Census 2000, approximately 21,600 households were reinterviewed based on an initial sample of 30,000. Sample attrition occurred as a result of vacant structures, movers, noninterviews, etc. About 20,000 cases were analyzed for this report.

Following the census, these cases were reinterviewed and asked many of the same items as posed by the decennial long form. To create the CRS questionnaire, we made only minor modifications to the questions from the census long form. These modifications were made to account for needed reinterview instructions, reference period changes, etc. To reduce the burden placed on sampled households and to reduce costs, the reinterview questionnaire collected person-level data on only one randomly selected person in the household.

After matching the census and CRS households, we used census and CRS data to calculate the index of inconsistency. Then we analyzed the data.

1.4 Overview of CRS 2000 report

We present only national statistics in this report. We did not analyze the data for smaller geographic areas.

Chapter 2 of this report presents the methods we used in conducting the CRS in 2000. It presents descriptions of data collection and preparation and also descriptions of the measures of response error. We also discuss interpretations of the measures of response error. Chapter 3 presents limitations of this survey. Chapter 4 presents analyses of the consistency of the questions for both population characteristics and housing characteristics. Chapter 5 presents recommendations for improvement. Tables of response variance measures, descriptions and examples for the computation of response variance measures and their 90-percent confidence intervals, and cross-tabulations of census versus CRS counts are in the appendixes following Chapter 5.

2. METHODS

The 2000 CRS was a “test-retest” design in which a sample of households from Census 2000 long-form respondents were contacted a second time and asked most of the long-form questions a second time. This CRS differed from past decennial CRSs in that we asked no probing questions to estimate response bias. In addition, we:

- asked the CRS person-specific questions for only one randomly chosen person in each household, and
- removed the place-of-work, occupation, industry, employment status, and class-of-worker questions.

2.1 How we conducted the survey

In January 2000, prior to Census 2000, a division of the U.S. Census Bureau took a systematic sample of 30,000 long-form cases from a subset of approximately 100,000 long-form cases already selected for the Trace Study. That division flagged each case to designate that it belonged in the reinterview sample. This activity occurred before census enumeration. For that reason, CRS cases could be identified as they passed through census processing. Then the CRS cases could be sent for CRS data collection.

The CRS questionnaires, along with corresponding dependent data on the sample file, were printed at a Census Bureau facility in Jeffersonville, Indiana. The printed questionnaires were routed to the twelve regional offices after enumeration was completed for Census 2000.

After the Census Bureau received Census 2000 questionnaires for households selected for the CRS, we sent introductory letters to the households prior to the CRS. Current survey field representatives, and a few census enumerators, collected CRS data from late June through mid November, 2000.

The CRS questionnaire was almost identical to the census long form for enumerators, D-2(E). We made only minor modifications to account for needed reinterview instructions and changes to the reference periods. Any questions referring to the “previous week” on the census were deleted. This explains why we asked no questions about occupation, employment status, or transportation to work. (See the CRS and Census 2000 questionnaires in Appendix A.)

To reduce the burden placed on sampled households and to reduce costs, the reinterview questionnaire collected person-level data for only one randomly selected person in the household. We accomplished this by adding a column of randomly chosen integers to each roster - a different number for each roster line, a different list for each household. If the last name on the roster was on line n , then an integer I , randomly chosen from 1 to n , appeared in the added column to the right of the roster. That told the enumerator to choose the person on line I as the sample person. We collected up to 12 names on the CRS roster.

The modes of administration for the reinterview survey were personal visit and telephone. Telephone interview was the mode of choice, but personal visit interview was used to follow up with those households that could not be reached after a specified number of calls, or if the household was not reachable for various other reasons.

Table 1. Mode of administration of CRS

Mode	Frequency	Percent
Telephone	15,567	78.24
Personal visit	4,273	21.48
Both modes marked	14	0.07
No information on mode	43	0.22

The Census Bureau facility in Jeffersonville collected data from the CRS questionnaires via the Workflow and Imaging Processing System (WIPS). WIPS collected images and created data

files. Census 2000 used a different system to collect the census data.

Using matching software developed by a division of the U.S. Census Bureau, we matched CRS questionnaires to census questionnaires for data comparison and analysis. We followed computer matching with clerical matching. Of the 21,596 completed CRS interviews there were 19,897 cases where the household matched and 19,554 cases where the sample person matched. Only 19,649 of the household matches and 19,312 of the sample-person matches corresponded to Census 2000 long-form cases. In order to analyze the maximum number of cases for questions shared by long and short forms, we kept those few CRS cases that completed short forms for Census 2000.

2.1.1 Sampling

In planning for the CRS, we anticipated that we would lose 12 percent of the initial sample due to ineligibility, have a 20 percent non-response to the CRS, and lose 15 percent due to nonmatches. This was all based on past CRS experience. From the starting sample of 30,000 cases, this would produce a data set with $30,000 \times (0.88) \times (0.80) \times (0.85) = 17,952$ cases.

Cases for the CRS were chosen through a systematic sample of the long-form cases in the Trace Study that were not in Puerto Rico and were not chosen for the Accuracy and Coverage Evaluation of Census 2000. We excluded group quarters. The sampling rate was chosen to yield 30,000 cases. The Trace Study sample was chosen as a systematic sample of housing unit addresses on the Decennial Master Address File as it existed in January 2000. The sampling rate for the Trace Study was 0.5 percent (a sampling interval of 1-in-200). Sampling was designed to yield approximately 600,000 housing units (about 500,000 short forms and 100,000 long forms)

After removing census noninterviews, CRS noninterviews, and nonmatches, we had 19,897 household-level matches, 19,554 of which were sample-person matches.

2.2 (Un)edited census data

In the final processing step of census data, the data went through computer edit and allocation programs. These edited census data contained imputations for missing data and corrections based on consistency checks. Because the census editing procedures often required information about the other roster persons or about geographically adjacent housing units, it was impossible to simulate these same procedures for the CRS. We did not use the final, edited census data.

The census data we used were from the Sample Census Unedited File (SCUF) for the majority of items. These files contained data captured by the Data Capture System 2000 (Lockheed Martin). Any item on a Census 2000 questionnaire with a low optical mark recognition confidence level or low optical character mark confidence level was keyed from the census image immediately. We collected the codes for Census 2000 write-in items off the final SCUF.

We mimicked census edits of the final SCUF for only the race, Hispanic-origin, and ancestry items, for both the CRS and census data, prior to analysis.

2.3 How we prepared the dataset for analysis

A division of the U.S. Census Bureau converted files produced by the WIPS to SAS datasets. They removed CRS duplicates and noninterviews and recoded single-response questions that had multiple responses. If multiple responses could not be recoded as a single response (to a single-response question), then we removed those responses from our analysis.

We downloaded census person-level and household-level files for cases chosen to be in the CRS. After first downloading SCUF data, we found that not all Master Address File identifiers (MAFIDs) were on the SCUF. Then we downloaded data for the missing cases from the Hundred percent Census Unedited File. Eventually we discovered that 111 CRS cases had problems with their MAFIDs. These 111 cases were duplicates on the census. We found MAFIDs for 68 of them from a listing of census cases with “surviving MAFIDs.” We found MAFIDs for the other 43 cases from a file that compared addresses. Using the MAFIDs we found for those 111 cases we downloaded their data.

After we had a good listing of MAFIDs, we matched cases by MAFID. Using matching software produced by the U.S. Census Bureau, we did computer matching to determine if the CRS and census were completed for the same household and sample person. We matched on MAFID and CRS sample person. The matching software was not able to match all cases. We followed computer matching with clerical matching. If the CRS sample person was not on the census roster, we compared the rosters to determine if we had the same household.

Prior to analysis we downloaded the codes for write-in items on the census from the final SCUF data. Divisions of the U.S. Census Bureau ran autocoding software to convert write-ins on the CRS to codes. Then two divisions of the U.S. Census Bureau did clerical coding of those write-ins on the CRS that the autocoding software could not handle. The differences between these operations for the CRS and Census 2000 were:

- The CRS used information only about the sample person for coding. The census could use information about other individuals in the household.
- The two operations used different “expert coders” for the clerical operation.

Analysts from a division of the U.S. Census Bureau created new variables to incorporate skip patterns and to convert numeric data into categorical data. We did this for data from both the CRS and Census 2000.

The CRS and Census 2000 datasets had illegible number data replaced with all 8s. For example, if the five-digit monthly rent was illegible, it was given as “88888.” We excluded those values from the CRS analysis.

The rules for both the CRS and Census 2000 said that if a numeric answer was too large for the space allotted, then the response should be filled with 9s. For example, a monthly rent of \$250,000 would have been recorded as \$99,999. For the CRS analysis we put these extremely large values in the highest response categories “... or more.”

2.4 Measures of response error

Random errors of measurement in the survey process (non-sampling error) increase the total error of the data collected. Response error (one type of non-sampling error) is made up of response bias and simple response variance. For the 2000 CRS we evaluated only simple response variance.

2.4.1 Response error: response variance and response bias

Simple response variance, reflecting random variation in respondents' answers, is the average variance of responses from the same unit to the same question over repeated questioning. The index of inconsistency (index) and the gross difference rate (GDR) are the principal measures (in this report) of simple response variance for categorical data. Data are called categorical if their values can be sorted into non-overlapping categories (e.g., "male" and "female" for sex). We estimated the index and the GDR for each question category. Overall estimates of the index and the GDR for a question, the aggregate index and the aggregate GDR, apply to questions with three or more answer categories.

Response bias reflects a systematic pattern or direction in the difference between the respondents' answers to a question and the "correct" answers. For the 2000 CRS we did not analyze response bias.

2.4.2 Estimating simple response variance

For a categorical question, the lowest level of analysis is performed by individual category. In this analysis, each respondent either chose the category ($Y_i = 1$) or did not ($Y_i = 0$). To describe the measures of response variance we introduce some notation.

Let Y_{ij} be the response of the j^{th} unit in the i^{th} interview. The census interview is given by $I = 1$. The CRS interview is given by $I = 2$. Assume that

$$\begin{aligned} Y_{1j} &= \mu_j + b_1 + e_{1j} \text{ (census interview model)} \\ Y_{2j} &= \mu_j + b_2 + e_{2j} \text{ (CRS interview model)} \end{aligned}$$

For the j^{th} unit, this means that

$$\text{Recorded value} = \text{True value} + \text{Bias} + \text{Variable error.}$$

The bias b_i is the tendency for systematic error associated with the i^{th} interview. The variable error arising from a combination of all other sources of error in the survey is given by e_{ij} . The deviation of the recorded value Y_{ij} from its true value μ_j is $b_i + e_{ij}$. For categorical data, μ_j is either 0 or 1.

Table 2, below, illustrates the results of a comparison of census data with CRS data for a sample of n units. If the unit had the characteristic, it was given a value of 1. Otherwise it was given a value of 0. If the unit did not respond to the item, then that unit was not included in the analysis.

Table 2. Cross-tabulation of census results by CRS results

CRS response (Y_{2j})	Census response (Y_{1j})		Total
	1	0	
1	a	b	a+b
0	c	d	c+d
Total	a+c	b+d	n = a+b+c+d

- The proportion of units reporting the characteristic on the census is $p_1 = (a+c)/n$.
- The proportion of units reporting the characteristic on the CRS is $p_2 = (a+b)/n$.
- The proportion of units not reporting the characteristic on the census is $q_1 = 1-p_1 = (b+d)/n$.
- The proportion of units not reporting the characteristic on the CRS is $q_2 = 1-p_2 = (c+d)/n$.

Simple response variance measures the average variability, across units, of responses to the same question over repeated trials. If the survey conditions are identical for the census and the CRS, and the errors are uncorrelated, then an unbiased estimator of the simple response variance is given by $(b+c)/(2n)$.

For each category within each question to be analyzed, we calculated and interpreted the following:

- The index of inconsistency (index) is the ratio of the simple response variance to total variance. It is a relative measure of response variance. The index shows the relative effect the simple response variance has on the resulting estimates. For the tables in this report, we replaced any value over 100.0 for the index of inconsistency (or one of its confidence limits) with 100.0.

The index of inconsistency estimates the ratio of simple response variance to the sum of the sampling variance and the simple response variance when the census and CRS are independent repetitions of the same survey procedure under the same general conditions. The response error reinterview model assumes the reinterview is an independent replication of the original interview.

- Independence means that the response errors are not correlated between the original interview and the reinterview. If the respondents remembered their original answers and consciously repeated them in the reinterview, the independence assumption would be violated. Lack of independence generally results in underestimates of response variance.
- Replication means that the reinterview was conducted under the same conditions as the original interview. If the reinterview replicates the original interview, the distribution of the original and reinterview responses will be the same. With quantitative data, the means and variances of the original and reinterview responses will be equal if there is perfect replication. With categorical data, the difference between the original proportion in-category and the reinterview proportion in-category, the net difference rate (NDR), will be zero if there is perfect replication.

- Gross difference rates (GDRs) give the percentage of changes between census and CRS into or out of that category. The GDR is the percentage of responses that fall in a category in the original interview but not in the reinterview, or vice versa. For a single category, one-half the GDR estimates the simple response variance. For the example in Table 2 the GDR is given by $GDR = (b+c)/n$.

When the CRS is an independent replication of the census then the total variance can be estimated by $\frac{1}{2}(p_1q_2+p_2q_1)$. Hence, an estimator of the index of inconsistency is given by

$$\begin{aligned}\hat{I} &= \frac{GDR / 2}{\frac{1}{2}(p_1q_2 + p_2q_1)} \\ &= \frac{GDR}{p_1q_2 + p_2q_1} \\ &= \frac{b + c}{\frac{1}{n}[(a + c)(c + d) + (a + b)(b + d)]}.\end{aligned}$$

- Question-level aggregates (GDR and index of inconsistency) measure the GDR and index for the entire question. The aggregate index will indicate whether the whole question has a problem versus, say, just one category in a multi-category question.
- Net difference rates (NDRs) give the difference between the original percent in a specific answer category and the reinterview percent in that category. The net difference rate measures the net effect of responses changing into and out of that category. The NDR helps indicate how well the reinterview meets the model assumptions. A statistically significant NDR (i.e., statistically different from zero) suggests that the reinterview may not replicate the original survey conditions as well as desired. For the example in Table 2 the NDR is given by $NDR = (c-b)/n$.

Any of these factors may cause high response variance:

- The methods used to collect the data may need improvement or the question may be unclearly written.
- The concept itself may not be measurable.
- Respondents may not be able to provide reliable information to the level of detail asked.
- The data capture may be inaccurate.

2.4.3 Interpreting values of the index of inconsistency

An aggregate index of zero means responses were in perfect agreement, but an index of 100 does not mean that all of the respondents changed answers. Rather, it means that we observed what we could expect if there were only chance agreement between original and reinterview answers.

We used this rule of thumb to interpret the index of inconsistency and the aggregate index:

Table 3. Interpretation of index of inconsistency

Index value	Inconsistency level	Interpretation
Less than 20	Low	Usually not a major problem
20 up to 50	Moderate	Somewhat problematic
Greater than 50	High	Very problematic

The index of inconsistency is a point estimate. The inconsistency level is determined by the index of inconsistency, as shown in Table 3, above. For example, the index of inconsistency for CRS question 37, telephone service, is 54.7. The inconsistency level is high.

2.4.4 The index of inconsistency for rare categories or small sample size

A rare characteristic is one that is not widely distributed among a population. From a response variance perspective we say a characteristic is rare when 5 percent or less cases fall in the category represented by the characteristic. The index of inconsistency may be substantially higher for rare categories when only a few individuals among the small number reporting the characteristic change their response (interview vs. reinterview). This may also be a problem for small sample sizes, even when they don't have rare characteristics.

A category which represents a rare characteristic will have small total variance. This makes the ratio of the simple response variance to total variance seem larger in comparison to that ratio for more common characteristics. We may observe high indexes for rare categories in a distribution even though the gross difference rate (the proportion of individuals in the sample changing their minds) may be small.

- Small Sample Size (but not rare). In many instances for which the number of cases responding to a question was small (< 60), the confidence intervals were unstable (that is, had an extremely wide confidence interval). Therefore, as a rule we did not report response variance measures for any questions for which the sample size was less than 60.
- Large In-category Sample Size (but rare). There were a number of instances in which a large number of cases reported a characteristic yet the category was considered rare. This occurred when the in-category sample size was small relative to the entire sample. Under this circumstance the confidence interval was often narrow and the estimate of the index was stable.

2.4.5 Comparing indexes of inconsistency

To compare the index of inconsistency for a particular question from one subgroup to the index from another subgroup we used z-tests, at the 90-percent confidence level. These tests can be found in many statistics texts. We tested the null hypothesis that the two subgroups had the same index versus the alternate hypothesis that the index was larger for one of the two subgroups. At the 90-percent confidence level, if the z-value was greater than 1.282 (or less than or smaller than -1.282) then one of the two subgroups had a larger (or smaller) index than the other subgroup.

To compare the overall inconsistency of two subgroups we used the Wilcoxon matched-pair signed-rank test. The Wilcoxon matched-pair signed-rank test can be found in Hollander and Wolfe (1973), pages 27-32. To compare the overall inconsistency for more than two subgroups, we used a test by Hollander. This test generalizes the Wilcoxon matched-pair signed-rank test, and can be found in Hollander and Wolfe (1973), pages 167-170.

2.5 Applying quality assurance procedures

We applied quality assurance procedures throughout the creation of this report. They encompassed how we determined evaluation methods, created specifications for project procedures and software, designed and reviewed computer systems, developed clerical and computer procedures, analyzed data, and prepared this report.

3. LIMITS

There are a number of limitations to this report, both on the type of analysis possible and on the measures of response variance.

3.1 Methodology

The test-retest response evaluation methodology in this report measures simple response variance. It does not address response bias. We did not ask probing questions. Probing questions have been used to address the issue of bias in the past.

We did not design the CRS so that we would be able to attribute error to any individual source(s) of error. The analysis provides overall response variance measure at the national level.

3.2 Replication of census enumeration

The census enumeration was not exactly replicated. About 58.3 percent of all preselected CRS cases completed mailback forms for Census 2000. Around three quarters of the cases analyzed for the CRS completed mailback forms for Census 2000. The mode of administration for reinterview (telephone or personal visit) may not have reflected the census mode (primarily

mail). Previous researchers¹ indicated that data collected by mail is less inconsistent than data collected by enumerators. Census inconsistency may actually be higher than indicated in this report, because the data we analyzed came mostly from census mailback cases. Additionally, the person answering on the reinterview survey might not have been the census respondent. We determined if the same respondent answered the housing questions on the CRS and census from question 50 on the CRS. We determined if the same respondent answered the population questions on the CRS and census by analyzing responses from CRS questions 28a, 28b, and 28c. In this report, “proxy” refers to a respondent who was a household member but not the sample person.

Table 4. Respondent for housing characteristics

Respondent	Count	Percent
The same respondent provided housing answers on CRS and Census 2000	14,665	73.7
Another household member provided housing answers for Census 2000	4,257	21.4
Unable to determine	975	4.9
Total	19,897	100.0

Table 5. Respondent for population characteristics

Respondent	Count	Percent of total
Same respondent on CRS and census	13,375	68.4
Self on CRS, self on census	9,433	48.2
Same proxy on both CRS and census	3,942	20.2
Different respondent on CRS and census	4,298	22.0
Self on CRS, proxy on census	1,431	7.3
Proxy on CRS, self on census	1,631	8.3
Different proxy on CRS than on census	1,236	6.3
Unable to determine	1,881	9.6
Total	19,554	100.0

3.3 Sampling variability

In this report we present data determined from the numbers of sample housing units and sample persons, i.e., the data are not weighted up to national estimates. We selected the sample households with a single-stage systematic sample; so each housing unit had the same weight. We selected sample persons by random sampling within each household. Each person in a household had an equal probability of selection, within that household. Sample persons within households of the same size had the same weight.

¹Bushery, John M., Brick, J. Michael, Severynse, Jacqueline, and McGuinness, Richard A. (1996). “How interview mode affects data reliability,” Proceedings of the Section on Survey Research Methods, American Statistical Association, pp 600-604.

Based on sample data, the measures in this report are subject to sampling variability. A 90-percent confidence interval accompanies each measure (net difference rate, gross difference rate, index of inconsistency) computed from these data. Sample size (for both the national sample and for subgroups) and percent-in-CRS are also subject to sampling variability.

3.4 Sources of response error

This report compares census and CRS data before imputations and consistency edits. We did minimal editing for skip patterns. We edited for the race, Hispanic-origin, and ancestry questions as if there were only one member to the household. That is, we used information about the sample person only when doing those edits. The edits for race, Hispanic origin, and ancestry on Census 2000 could use information from more than just the individual in question.

The response error measures in this study capture those errors introduced in the actual collection and capture of data. Contributors to response error include, but are not limited to, the following:

- Questionnaire design
- Interview administration mode
- Question wording
- Inadequate instruction
- Interviewer effects
- Deliberate falsification by respondent or interviewer
- Scanning error

On the census enumerator questionnaire, Form D-2(E), the roster had room for five names, together with questions about relationship to person 1, sex, age, Hispanic origin, and race. The roster was followed by questions about person one, housing questions, and questions about the other roster members. There was a supplemental census form for households with more than five members.

The CRS questionnaire was meant to mimic the D-2(E). The CRS roster could hold up to 12 names, and was used to randomly select the CRS sample person. On the page following the roster, the person-level questions began. Before the housing questions began there was a question to determine if the CRS respondent:

- Was the CRS sample person and
- Had answered for the sample person on the census.

The design of the census questionnaire may have made it easier to remember which roster person the person-level questions were about. Within the person-level questioning for the CRS we removed the census occupation, work status, and transportation questions between the questions on military service and working last year. That series of questions on the census might have made it easier to remember other information about income for the census respondents. The CRS respondents did not have that opportunity.

If the administration mode (telephone, personal visit, mailout/mailback) was different between the CRS and Census 2000, that would most likely affect responses to questions with instructions to show a card with responses listed. These questions were:

Question topic	CRS question	Census question, Form D-2(E)
Hispanic origin	9	5
Race	10	6
Educational attainment	13	10
Period of military service	24b	21b
Building description	30	35
Heating fuel	38	43
Value of property	47	56

Question wording for the CRS and the census enumerator questionnaire was very similar. Because there were very few references to time period for the housing questions, it is possible that respondents answered using the date of the CRS interview as their time reference. That might have affected questions about owner/renter status, number of rooms, number of bedrooms, plumbing facilities, telephone service, number of vehicles, and mortgages.

Inadequate instructions might have lead to questions being misunderstood or not understood as planned. For example, inadequate instruction to the CRS enumerators might have caused the enumerator to ask all person-level questions about the respondent, instead of about the CRS sample person. Also, the pattern of question flow might have been adversely affected by inadequate instruction to whoever filled out the questionnaire.

Interviewer effects occur when the interviewer’s behavior, appearance, or manner of speaking influence respondents’ answers. Some of this effect is unconscious, the result of cultural or social perceptions. A respondent might answer a woman differently from a man, a person of one race differently from another. There might also be a tendency for respondents to answer in a “socially acceptable,” rather than honest, manner.

Deliberate falsification on the part of census and CRS interviewers, or on the part of the respondent, might have introduced error. We did a quality control (QC) check of the CRS, checking only CRS noninterviews from a preselected sample of 6,000 CRS cases. Noninterviews included households that were vacant, destroyed, or replaced by an entire new group of people. Only one CRS interviewer was suspected of falsification, from the 1,115 cases eligible for the QC check. That interviewer was cleared of any wrongdoing.

Scanning errors included error introduced by the scanning method. They could have had an effect on all questions. Of major interest would be the effect on the Hispanic-origin and race questions. Not only could error be introduced by scanning hardware and software, but the methods were different for the CRS and Census 2000. The CRS used WIPS for scanning and Census 2000 used Lockheed-Martin for scanning. We did not do a formal check of the quality of data collection for the CRS and have not been able to compare it to the quality of data collection for Census 2000.

3.5 Form type

We planned the CRS to study response variance for census long-form questions. We selected sample households from the universe of all households scheduled to receive census long forms. For various reasons, not all housing units received the scheduled form. Since we asked person-level questions only about the CRS sample person, the housing and person counts in Table 6 differ. When we checked that the CRS and census households were the same, sometimes the CRS sample person was missing from the CRS. In those cases we determined from the rosters that we had the same household for both surveys.

Table 6. Census forms for CRS sample units

		Housing record		
Form type	Description	Count	Percent of total	
Long form			19,649	98.75
D-2	Long Form MR*	10,914		54.85
D2(UL)	Long Form MR	3,902		19.61
D-2(E)	Long Form EQ#	4,833		24.29
Short form			248	1.25
D-1	Short Form MR	180		0.90
D-1(UL)	Short Form MR	5		0.03
D-1(E)	Short Form EQ	50		0.25
D-10	Be Counted	13		0.07
Total		19,897	19,897	100.00
		Person record		
Long form			19,312	98.76
D-2	Long Form MR	10,766		55.06
D2(UL)	Long Form MR	3,862		19.75
D-2(E)	Long Form EQ	4,607		23.56
D-2(E) SUPP	Enumerator Supplement, long	77		0.39
Short form			242	1.24
D-1	Short Form MR	178		0.91
D-1(UL)	Short Form MR	5		0.03
D-1(E)	Short Form EQ	48		0.25
D-10	Be Counted	11		0.06
Total		19,554	19,554	100.00

* MR = Mailback-type questionnaire

EQ = Enumerator-return type questionnaire

3.6 Noninterviews

We initially drew a sample of 30,000 housing units so that we would have at least 18,000 cases after deleting census noninterviews, CRS noninterviews, and cases that didn't match between CRS and census. Census noninterviews included vacant, demolished, and not-able-to-locate addresses, among others. At check-in, we had:

21,596	Completed CRS Interviews (22 percent ineligible and 8 percent nonresponse)
1,880	Type A CRS Noninterviews (e.g., unable to locate, no one home, temporarily absent, refusal)
2,691	Type B CRS Noninterviews (e.g., Vacant) - Ineligible
1,105	Type C CRS Noninterviews (e.g., Demolished) - Ineligible
1,963	Type D CRS Noninterviews (Movers) - Ineligible
<u>765</u>	Census Noninterviews and Deletes - Ineligible
30,000	

3.7 Matching

In order to keep matching problems to a minimum, we selected units from the Decennial Master Address File (DMAF) prior to census enumeration. Some cases selected were census noninterviews and some received different forms than initially planned. By using the DMAF we were able to track housing units through the census process. As the census forms were checked in, we sent the CRS cases to field.

In order to assure that the CRS data were from the same household as the census data, we ran matching software produced by the Statistical Research Division of the U.S. Census Bureau. We followed the matching program with clerical matching, in an effort to find more units that matched between the census and the CRS.

During data examination and matching, we removed:

34	Duplicates
7	CRS noninterviews
580	On household-level Census Unedited Files (CUF) but not on person-level CUF
3	Group Quarters cases in sample
428	Not on any CUF
<u>990</u>	CRS sample person not on census roster
2,042	

Of the 990 cases in which the CRS sample person was not on the census roster, we determined that 343 were household matches. This meant that we had 343 more cases eligible for analyzing the housing characteristics than for the population characteristics.

Table 7. Matching

	Household-level matches	Sample-person matches
SRD matching software	18,500	18,500
Clerical matching	1,397	1,054
Total	19,897	19,554

3.8 Timing

We conducted the CRS after the DMAF showed receipt of census data for a household. (“Receipt” included return of noninterviews.) The CRS interviews were performed from late June through mid November, 2000. Up to seven and a half months elapsed between Census Day (April 1, 2000) and the CRS.

Due to the time lag between the CRS and Census 2000, the CRS may fail to meet the reinterview assumptions. Too little time passing between a reinterview and the original survey can increase the effects of conditioning or recall. Too much time passing between a reinterview and the original survey can cause error. The respondent may have recall problems, or the respondent may answer the questions as of the reinterview date and not as of the original date. The telephone question illustrates this situation. Most households in the United States have telephone service. Those few households reporting they don’t have telephone service might change that status from month to month. It may be difficult for them to remember when their change in status occurred. Long lag between reinterview and survey also increases the chance that respondents move before reinterview is conducted.

4. RESULTS

4.1 How consistent were census long-form data for population characteristics?

The population characteristics evaluated by the Content Reinterview Survey were those dealing with:

- Sex
- Age
- Hispanic origin
- Race
- Marital status
- School attendance
- Educational attainment
- Ancestry
- Language usage
- Place of birth
- Citizenship
- Year of entry to the United States
- Migration (place of residence on April 1, 1995)
- Disability
- Grandparents as caregivers
- Military service
- Work experience in 1999
- Income

We will discuss Hispanic origin and race later in section 4.2.

Facsimiles of the CRS and census questionnaires are shown in Appendix A. Response variance measures for all questions are presented at the national level in Appendix C. Summary measures for the population characteristics by subgroup are also given in these tables. Table 8 shows the population subgroups and which census or reinterview questions we used to determine these subgroups. These questions can be found in the CRS and census questionnaires shown in Appendix A. For the population characteristics, there are seven distinct subgroup types – race, Hispanic origin, sex, citizenship status, age, collection type, and respondent type. Refer to section 4.5 for more information about how respondent type was determined using CRS question 28. Data comparison tables for each population question are presented at the national level in Appendix E. All sample sizes and response variance measures for the population characteristics provided in section 4.1, Appendix C, and Appendix E are weighted unless stated otherwise.

Table 8. Questions used to determine population subgroups

Subgroup	Question
Race <ul style="list-style-type: none"> • White • Black, African Am., or Negro • Asian • Other single race* • Two or more races 	Race (edited census, question 6)
Hispanic Origin <ul style="list-style-type: none"> • Hispanic • Non-Hispanic 	Hispanic origin (edited census, question 5)
Sex <ul style="list-style-type: none"> • Male • Female 	Sex (unedited census, question 3)
Citizenship status <ul style="list-style-type: none"> • Native • Foreign born 	Citizenship (unedited census, question 14)
Age <ul style="list-style-type: none"> • 6-15 years • 16-35 years • 36-64 years • 65 years or older 	Age (unedited census, question 4)
Collection type <ul style="list-style-type: none"> • Mailback forms • Enumerator forms 	Census collection type <ul style="list-style-type: none"> • D-1 (Short form), D-2 (Long form), D-1(UL) (Short form, update-leave), D-2(UL) (Long form, update-leave), D-10 (Be Counted) • D-1E (Short form), D-2E (Long form), D-2E(SUPP)
Respondent type <ul style="list-style-type: none"> • Self-response in both census and CRS • Self-response in census and proxy[#] in CRS • Proxy[#] in census and self-response in CRS • Same proxy[#] in both census and CRS • Different proxy[#] in census than CRS 	Census and CRS respondent type (unedited CRS, question 28a, 28b, 28c)

* “Other single race” includes American Indian or Alaska Native, Pacific Islander, and Some other race.

“Proxy” refers to a respondent who was a household member but not the sample person.

4.1.1 Consistency of reports for the total U.S.

The questions dealing with each population characteristic listed above and the inconsistency levels for each question for the total U.S. are given in Table 9 below. The estimated aggregate index for each question can be found in Appendix C.

Table 9. Inconsistency levels for population characteristics

Population characteristic	CRS question	Census question*	Inconsistency level	
Sex	7	3	Low	
Age	8	4	Low	
Marital status	11	8	Low	
School attendance:	school enrollment	12a	9a	Low
	grade level	12b	9b	Low
Educational attainment	13	10	Moderate	
Ancestry (single response only)	14	11	Moderate	
Language usage:	speak a language other than English	15a	12a	Moderate
	language spoken at home	15b	12b	Low
	English-speaking ability	15c	12c	High
Place of birth	16	13	Low	
Citizenship	17	14	Low	
Year of entry to the U.S.	18	15	Low	
Migration (place of residence on April 1, 1995):				
	live at current residence on April 1, 1995	19a	16a	Moderate
	live inside city limits	19b	16b	High
Disability:	sensory impairment	20a	17a	Moderate
	physical limitations	20b	17b	Moderate
	difficulty in learning, remembering, concentrating	21a	18a	High
	difficulty in dressing, bathing, getting around home	21b	18b	High
	difficulty going outside the home	21c	18c	High
	difficulty working at a job or business	21d	18d	High
Grandparents as caregivers:				
	grandchildren live here	23a	20a	Moderate
	responsible for grandchildren	23b	20b	Moderate
	how long responsible	23c	20c	High
Military service:	veteran status	24a	21a	Low
	on active duty April 1995 or later	24b1	21b1	Moderate
	on active duty Aug. 1990 to March 1995	24b2	21b2	Moderate
	on active duty Sept. 1980 to July 1990	24b3	21b3	Moderate
	on active duty May 1975 to Aug. 1980	24b4	21b4	Moderate
	on active duty in Vietnam era	24b5	21b5	Low
	on active duty Feb. 1955 to July 1964	24b6	21b6	Moderate
	on active duty during Korean conflict	24b7	21b7	Low
	on active duty during World War II	24b8	21b8	Low
	on active duty some other time	24b9	21b9	High
	years of military service	24c	21c	Moderate
Work experience in 1999:				
	work last year	25a	31a	Moderate
	weeks worked last year	25b	31b	High
	usual hours worked each week	25c	31c	Moderate
Income:	amount received from wages	26a	32a	Moderate
	amount received from self-employment income	26b	32b	Moderate
	amount received from interest	26c	32c	Moderate
	amount received from Social Security	26d	32d	High
	amount received from SSI	26e	32e	High
	amount received from public assistance	26f	32f	High
	amount received from retirement	26g	32g	Moderate
	amount received from other sources	26h	32h	Moderate
	total income received	27	33	Moderate

* The question numbers in this column refer to the enumerator long-form questionnaire (D-2E).

The summary tables contained in sections 4.1.2 to 4.1.6 include race and Hispanic origin. See section 4.2 for a discussion on the race and Hispanic-origin questions. Table 10, below, gives a summary of the levels of inconsistency for population items.

Table 10. Summary of population inconsistency

	Low	Moderate	High
	16	26	16

4.1.2 Consistency of reports by race of sample person

Table G.1 in Appendix G contains the inconsistency level and aggregate index of inconsistency by race of sample person for the population characteristics. Table 11 below summarizes the data in Table G.1.

Table 11. Summary of inconsistency levels by race of sample person

Race	Inconsistency level			
	Low	Moderate	High	Unstable, undefined, or insufficient data to calculate
White	16	28	12	2
Black	10	18	21	9
Asian	13	9	16	20
Other single race*	8	15	17	18
Two or more races	11	17	10	20

* "Other single race" includes American Indian or Alaska Native, Pacific Islander, and Some other race.

We used the Hollander test for ordered alternatives to compare the overall inconsistency by racial subgroup for population questions. From top to bottom, from least inconsistent to most inconsistent, we list the racial subgroup of the CRS sample person ($z = 3.1$).

- White
- Asian
- Two or more races
- Black
- Other single race

4.1.3 Consistency of reports by Hispanic origin of sample person

Table G.2 in Appendix G contains the inconsistency level and aggregate index of inconsistency by non-Hispanic/Hispanic origin of sample person for the population characteristics. Table 12 below summarizes the data in Table G.2.

Table 12. Summary of inconsistency levels by Hispanic origin

Hispanic origin	Inconsistency level			
	Low	Moderate	High	Unstable, undefined, or insufficient data to calculate
Hispanic	9	18	15	16
Non-Hispanic	15	28	15	0

Households with non-Hispanic sample persons showed less inconsistency than households with Hispanic sample persons when answering 28 of the population questions including questions about age, marital status, school attendance, educational attainment, ancestry, citizenship, year of entry to the U.S., disability, and work experience in 1999. Households with Hispanic sample persons showed less inconsistency than households with non-Hispanic sample persons when answering questions about place of birth, place of residence on April 1, 1995, and amount received from interest. The sample size was too small to calculate the index for households with a Hispanic sample person for population questions about period of military service and amount of Social Security, Supplemental Security Income, public assistance, retirement, and other sources of income received in 1999. For the remaining eleven questions, the index was not significantly different at the 90-percent confidence level. To compare two subgroups we used z-tests with 90-percent confidence.

We used the Wilcoxon matched-pair signed-rank test to compare the overall inconsistency by Hispanic-origin for the population questions. At the 90-percent confidence level, households with non-Hispanic sample persons showed less inconsistency than households with Hispanic sample persons ($z = 4.6$).

4.1.4 Consistency of reports by sex of sample person

Table G.3 in Appendix G contains the inconsistency level and aggregate index of inconsistency by sex of sample person for the population characteristics. Table 13 below summarizes the data in Table G.3.

Table 13. Summary of inconsistency levels by sex

Sex	Inconsistency level			
	Low	Moderate	High	Unstable, undefined, or insufficient data to calculate
Female	15	22	18	2
Male	14	25	15	3

Households with female sample persons showed less inconsistency than households with male sample persons when answering 16 of the population questions including age, year of entry to the U.S., physical limitations, years of military service, work last year, and usual hours worked each work. Households with male sample persons showed less inconsistency than households with female sample persons when answering nine of the population questions including questions about school enrollment, speaking a language other than English, place of birth, veteran status, and receiving self-employment income (yes/no), interest (yes/no), and Social Security (yes/no) in 1999. The sample size was too small to calculate the index or the index was unstable for one of

the subgroups for population questions about how long responsible for grandchildren, on active duty February 1955 to July 1964, on active duty some other time, amount received from Supplemental Security Income, and amount received from public assistance. For the remaining 27 questions, the index was not significantly different at the 90-percent confidence level. To compare two subgroups we used z-tests with 90-percent confidence.

We used the Wilcoxon matched-pair signed-rank test to compare the overall inconsistency by sex for the population questions. At the 90-percent confidence level, households with female sample persons showed less inconsistency than households with male sample persons ($z = 2.0$).

4.1.5 Consistency of reports by citizenship status of sample person

Table G.4 in Appendix G contains the inconsistency level and aggregate index of inconsistency by citizenship status of sample person for the population characteristics. Table 14 below summarizes the data in Table G.4.

Table 14. Summary of inconsistency levels by citizenship status

Citizenship status	Inconsistency level			
	Low	Moderate	High	Unstable, undefined, or insufficient data to calculate
Native	14	27	16	0
Foreign born	9	12	21	15

Households with native sample persons showed less inconsistency than households with foreign-born sample persons when answering 21 population questions including marital status, school enrollment, educational attainment, physical limitations, difficulty going outside the home, difficulty working at a job or business, and work experience in 1999. Households with foreign-born sample persons showed less inconsistency than households with native sample persons when answering questions about ancestry, language spoken at home, English-speaking ability, and Supplemental Security Income (yes/no). The sample size was too small to calculate the index for households with a foreign-born sample person for fifteen population questions about period of military service, years of military service, and amount of Social Security Income, public assistance, retirement, and other sources received in 1999. For the remaining seventeen questions, the index was not significantly different at the 90-percent confidence level. To compare two subgroups we used z-tests with 90-percent confidence.

We used the Wilcoxon matched-pair signed-rank test to compare the overall inconsistency by citizenship status for the population questions. At the 90-percent confidence level, households with native sample persons showed less inconsistency than households with foreign-born sample persons ($z = 3.4$).

4.1.6 Consistency of reports by age of sample person

Table G.5 in Appendix G contains the inconsistency level and aggregate index of inconsistency by age of sample person for the population characteristics. Table 15 below summarizes the data

in Table G.5.

Table 15. Summary of inconsistency levels by age

Age	Inconsistency level			
	Low	Moderate	High	Unstable, undefined, or insufficient data to calculate
6-15 years	8	8	14	27
16-35 years	8	17	21	11
36-64 years	7	29	19	2
65 years or older	11	19	18	9

We used the Hollander test for ordered alternatives to compare the overall inconsistency by age subgroup for population questions. From top to bottom, from least inconsistent to most inconsistent, we list the age subgroup of the CRS sample person ($z = 3.6$).

- 36-64 years
- 65 years or older
- 16-35 years
- 6-15 years

4.1.7 Consistency of reports for individual population characteristics – detailed results

In this section, we discuss the summary measures of response variance and their implications for each population question asked in the 2000 CRS (except Hispanic origin and race). We asked no probing questions and analyzed the data only for response variance. We used unedited data from both the CRS and census unless stated otherwise. The CRS and census item numbers from the respective questionnaires are listed in parentheses following the item name.

To compare individual questions for two subgroups we used z-tests with 90-percent confidence. Appendix G contains the inconsistency level and aggregate index of inconsistency by race, Hispanic origin, sex, citizenship status, and age of sample person for the population characteristics. Appendix I contains the inconsistency level and aggregate index of inconsistency by collection type and respondent type for the population characteristics. Appendixes G and I contain z-values also.

Sex (CRS 7, Census 3)

All respondents to Census 2000 were asked this question. The level of inconsistency in this question was low. The aggregate index of inconsistency was 1.7 (1.5 to 1.9). Approximately 1 percent (0.7 to 1.0) of the CRS respondents changed their answers when reinterviewed.

All subgroups showed low inconsistency. Respondents who reported on mailback forms showed less inconsistency than respondents who reported to enumerators.

Age (CRS 8, Census 4)

The age question used in Census 2000 was different from that used in the 1990 census. The 2000 question asked for age on April 1, 2000, whereas the 1990 question asked for age at last birthday. The age question was asked of all respondents to Census 2000. Month, day, and year of birth were also asked in both the census and CRS. If date of birth was reported, then we used date of birth to calculate age. If date of birth was not reported, then we used the age reported. We collected the responses to this question as numerical data and then we converted the data into the following five categories:

- 5 years or younger
- 6-15 years
- 16-35 years
- 36-64 years
- 65 years or older

These data were reported with low inconsistency. The aggregate index was 7.8 (7.4 to 8.2) and the aggregate GDR was 5.9 percent (5.6 to 6.2). The net difference rates for the “16-35 years,” “36-64 years,” and “65 years or older” categories were statistically different from zero indicating that the reinterview was not independent and/or did not replicate the original interview very well.

All subgroups showed low inconsistency. Households with female sample persons showed less inconsistency than households with male sample persons. Households with non-Hispanic sample persons showed less inconsistency than households with Hispanic sample persons. Respondents who reported on mailback forms showed less inconsistency than respondents who reported to enumerators.

Marital status (CRS 11, Census 8)

This question asked for the marital status of the sample person on April 1, 2000. In 2000, the marital status question was asked of long-form recipients only, whereas in 1990 the question was asked of all respondents. This question exhibited a low level of inconsistency with an aggregate index of 5.8 (5.4 to 6.2). About 3.6 percent of CRS respondents changed their answers when reinterviewed. The net difference rates for the “Divorced” and “Never married” categories were statistically significant suggesting that one or more of the model assumptions were not met.

Four of the five response categories showed low levels of inconsistency. Only the rare category “Separated” displayed moderate inconsistency. Less than 3 percent (2.6 to 3.0) of all CRS respondents reported that the sample person was in this category on either the census or CRS. The index for the “Separated” category was 35.2 (31.1 to 39.8) and approximately 1.0 percent (0.9 to 1.1) of respondents changed into or out of this category.

All subgroups showed low inconsistency. Households with non-Hispanic sample persons showed less inconsistency than households with Hispanic sample persons. Households with native sample persons showed less inconsistency than households with foreign-born sample persons. Respondents who reported on mailback forms showed less inconsistency than respondents who reported to enumerators.

School attendance (CRS 12a, 12b, Census 9a, 9b)

We asked all CRS respondents two questions about the sample person’s school attendance. If the sample person was at least three years of age, then we included their data in the analysis of these questions.

- School enrollment (CRS 12a, Census 9a)

School enrollment, whether a person has attended school or college (public or private) since February 1, 2000, was consistently reported. As shown in Table 16 below, this question showed less inconsistency in 2000 than in 1990 ($z = -6.1$).

Table 16. Aggregate response variance measures for school enrollment by decade

Inconsistency level	2000		1990		
	Index of inconsistency		Index of inconsistency		
	Estimate	90-percent confidence interval	Inconsistency level	Estimate	90-percent confidence interval
Low	13.5	12.8 to 14.3	Low	17.3	16.6 to 18.0

The aggregate index of inconsistency was 13.5 (12.8 to 14.3) in 2000 with 5.3 percent (5.0 to 5.6) of respondents changing answers. The “Yes, private school or private college” category displayed moderate inconsistency while the other two categories (“No” and “Yes, public ...”) displayed low inconsistency. The net difference rates for all three categories were statistically significant suggesting that one or more of the model assumptions were not met. The reinterview found more respondents reported “No, has not attended” and fewer respondents reported either of the “Yes” categories.

Households with male sample persons showed less inconsistency than households with female sample persons, although both were low. Households with non-Hispanic sample persons showed less inconsistency than households with Hispanic sample persons, although both were low. Households with native sample persons showed less inconsistency (low) than households with foreign-born sample persons (moderate). Respondents who reported on mailback forms showed less inconsistency than respondents who reported to enumerators, although both were low.

Collapsing the “Yes, public school or public college” and “Yes, private school or private college” categories into one “Yes” category yielded consistently reported data. The GDR became 4.0 percent (3.8 to 4.2) and the index became 10.7 (10.0 to 11.4), a slight improvement from 13.5.

There is moderate inconsistency between the reporting of public versus private education. We analyzed all cases where the respondent answered “Yes” to the school enrollment question in both the census and the CRS. We computed the index for the categories “public school or college” and “private school or college.” This analysis yielded an index of 25.0 (22.4 to 28.0) and a GDR of 5.6 percent (5.0, 6.2).

- Grade level (CRS 12b, Census 9b)

If the CRS respondent reported that the sample person attended school or college between February 1 and April 1, 2000, then they were asked to report the grade or level that the sample person was attending. This question was not included in the 1990 census. These data were reported with low inconsistency. The aggregate index for this question was 9.0 (8.2 to 9.9) and the aggregate GDR was 7.1 percent (6.4 to 7.8). All categories displayed low levels of inconsistency except the rare category “Graduate or professional school,” which showed moderate inconsistency. Approximately 4.3 percent (3.7 to 4.8) of respondents reported “Graduate or professional school” in the census or CRS.

The net difference rates for the “Nursery school, preschool” and “College undergraduate years” were statistically different from zero suggesting that the reinterview did not meet one or both of the model assumptions. Fewer respondents reported “Nursery school, preschool” in the CRS and more respondents reported “College undergraduate years.”

Households with non-Hispanic sample persons showed less inconsistency than households with Hispanic sample persons, although both were low. Respondents who reported on mailback forms showed less inconsistency than respondents who reported to enumerators, although both were low.

Educational attainment (CRS 13, Census 10)

This question asked for the highest degree or level of school the sample person had completed as of April 1, 2000. The educational attainment question has been modified since the 1990 census. First, the question wording was changed in 2000 to more directly ask about completion of highest degree or level of school instead of including this in an instruction as was done in 1990. Second, the nursery school, kindergarten, and 1st-4th grade categories were combined into one. Third, the 5th-8th grade category was split into two – “5th grade or 6th grade” and “7th grade or 8th grade.” Fourth, the some college but no degree category was split into two categories – “Some college credit, but less than 1 year” and “1 or more years of college, no degree.” Fifth, the occupational and academic associate degrees were combined into one category.

The educational attainment question showed less inconsistency in 1990 than in 2000 ($z = 7.5$). Table 17 below gives the inconsistency level and aggregate index for this question by decade.

Table 17. Aggregate response variance measures for educational attainment by decade

2000			1990		
Index of inconsistency			Index of inconsistency		
Inconsistency level	Estimate	90-percent confidence interval	Inconsistency level	Estimate	90-percent confidence interval
Moderate	36.5	35.8 to 37.2	Moderate	32.3	31.7 to 32.9

For 2000, if the sample person was at least three years of age, then we included their data in the analysis of the educational attainment question. The level of inconsistency in this question was

moderate. The index of inconsistency was 36.5 (35.8 to 37.2). The “Bachelor's degree” and “Master's degree” categories displayed low levels of inconsistency; the “9th grade,” “10th grade,” “12th grade - no diploma,” and “Some college credit, but less than 1 year” categories displayed high levels of inconsistency; and the remaining ten categories displayed moderate levels of inconsistency. The categories “12th grade – no diploma,” “Professional degree,” and “Doctorate degree” were rare.

Approximately 32 percent (31.7 to 32.9) of respondents changed answers when reinterviewed. Of the CRS respondents that changed answers:

- 9.8 percent (9.1 to 10.5) switched between “Some college credit, but less than 1 year” and “1 or more years of college, no degree;”
- 9.5 percent (8.8 to 10.2) switched between “High school graduate” and “Some college credit, but less than 1 year;”
- 8.6 percent (8.0 to 9.3) switched between “High school graduate” and “1 or more years of college, no degree;”
- 7.1 percent (6.5 to 7.6) switched between “12th grade - no diploma” and “High school graduate;” and
- 7.0 percent (6.4 to 7.6) switched between “No schooling completed” and “Nursery school to 4th grade.”

The net difference rates for ten categories were statistically different from zero suggesting that the reinterview may not have been an independent replication of the census.

Households with non-Hispanic sample persons showed less inconsistency than households with Hispanic sample persons, although both were moderate.

Table 18 below gives summary measures for percent confidence level and foreign-born sample persons. Households with native sample persons showed less inconsistency (moderate) than households with foreign-born sample persons (high). This suggests that the foreign-born population have more difficulty in answering this question. This is probably due to foreign-born respondents having problems relating their highest degree or level of schooling to the United States school system.

Table 19 provides summary measures by census collection type. The main difference between the mailback and enumerator forms was that enumerators showed a flash card displaying the response categories for this question. Respondents who reported on mailback forms showed less inconsistency than respondents who reported to enumerators, although both were moderate.

Table 18. Response variance measures for educational attainment by citizenship

Reinterview Classification	Native			Foreign Born		
	Inconsistency level	Index of inconsistency		Inconsistency level	Index of inconsistency	
		Estimate	90-percent confidence interval		Estimate	90-percent confidence interval
No schooling completed	Moderate	38.1	35.1 to 41.3	High	74.4	61.3 to 90.3
Nursery school to 4 th grade	Moderate	20.4	19.0 to 22.0	Moderate	42.7	35.2 to 51.9
5 th grade or 6 th grade	Moderate	31.5	28.8 to 34.4	Moderate	48.0	40.9 to 56.4
7 th grade or 8 th grade	Moderate	30.6	28.4 to 32.9	High	68.5	59.2 to 79.2
9 th grade	High	51.4	47.5 to 55.5	High	67.3	56.4 to 80.2
10 th grade	High	50.8	47.2 to 54.7	High	69.2	57.4 to 83.3
11 th grade	Moderate	47.9	44.5 to 51.5	High	64.1	52.1 to 79.0
12 th grade - no diploma	High	90.1	84.0 to 96.6	High	89.3	76.5 to 100.0
High School Graduate	Moderate	28.3	27.2 to 29.4	High	58.0	53.0 to 63.5
Some college credit, but less than 1 year	High	71.4	67.9 to 75.0	High	70.9	59.0 to 85.1
1 or more years of college, no degree	Moderate	43.9	42.0 to 45.8	High	62.5	55.6 to 70.4
Associate degree	Moderate	36.0	33.6 to 38.7	High	67.4	56.1 to 81.1
Bachelor's degree	Low	13.4	12.4 to 14.5	Moderate	33.5	28.8 to 38.9
Master's degree	Low	10.5	9.1 to 12.2	Moderate	29.4	22.6 to 38.2
Professional degree	Moderate	36.7	31.7 to 42.4	Moderate	49.7	36.6 to 67.4
Doctorate degree	Moderate	31.7	25.5 to 39.4	Moderate	32.6	20.9 to 50.7
Aggregate	Moderate	34.4	33.8 to 35.1	High	56.3	54.0 to 58.7

Table 19. Response variance measures for educational attainment by census collection type

Reinterview classification	Mailback Forms			Enumerator Forms		
	Inconsistency level	Index of inconsistency		Inconsistency level	Index of inconsistency	
		Estimate	90-percent confidence interval		Estimate	90-percent confidence interval
No schooling completed	Moderate	44.8	41.0 to 48.9	Moderate	34.2	29.6 to 39.5
Nursery school to 4 th grade	Moderate	21.1	19.4 to 22.9	Moderate	23.7	21.0 to 26.7
5 th grade or 6 th grade	Moderate	34.2	31.2 to 37.4	Moderate	35.0	30.4 to 40.4
7 th grade or 8 th grade	Moderate	32.4	30.0 to 35.1	Moderate	41.3	36.7 to 46.5
9 th grade	Moderate	49.9	45.8 to 54.4	High	63.1	55.8 to 71.4
10 th grade	High	50.7	46.7 to 55.0	High	59.1	52.5 to 66.6
11 th grade	High	50.8	46.9 to 55.0	Moderate	46.6	40.8 to 53.2
12 th grade - no diploma	High	87.7	81.2 to 94.8	High	93.0	83.4 to 100.0
High School Graduate	Moderate	27.9	26.8 to 29.2	Moderate	39.1	36.7 to 41.6
Some college credit, but less than 1 yr	High	69.0	65.4 to 72.8	High	81.4	73.6 to 90.1
1 or more years of college, no degree	Moderate	42.3	40.3 to 44.4	High	56.1	52.1 to 60.5
Associate degree	Moderate	35.2	32.6 to 37.9	High	50.7	44.7 to 57.6
Bachelor's degree	Low	13.4	12.3 to 14.6	Moderate	26.2	23.0 to 29.9
Master's degree	Low	11.1	9.6 to 12.8	Moderate	21.0	16.2 to 27.3
Professional degree	Moderate	38.1	33.1 to 43.8	Moderate	41.9	29.6 to 59.4
Doctorate degree	Moderate	30.3	24.6 to 37.3	Moderate	42.4	24.3 to 74.0
Aggregate	Moderate	34.2	33.5 to 35.0	Moderate	44.1	42.6 to 45.5

Ancestry (CRS 14, Census 11)

The only change to this question in 2000 was made to the list of examples. For Census 2000, the list of examples for the question was reduced from 21 to 16 examples. German, Croatian, Ecuadoran, Cajun, Irish, Thai, and Slovak were dropped from the 1990 list and Cambodian and Nigerian were added for 2000. Each CRS respondent was asked to state the sample person's

ancestry group with which he or she identified. This question was open-ended (respondents and enumerators wrote in answers) and there were two write-in lines provided. Some respondents and enumerators wrote more than two ancestry groups in the lines provided. In these cases, we took the first two ancestry groups provided in both the census and CRS. We coded responses to this question. In both the census and the reinterview, we performed minimal editing for the ancestry question prior to analysis, but we did no imputation.

We had difficulty in analyzing these data because both the census and the CRS allowed multiple responses. For initial analysis, that data for all respondents who provided a single ancestry in the census and a single ancestry in the reinterview were compared. Their responses were collapsed into 58 categories which are shown in Appendixes C and E. These data for single responses were reported with moderate inconsistency. The aggregate index of inconsistency was 30.7 (29.9 to 31.6) and approximately 29 percent (27.8 to 29.3) of respondents changed answers when reinterviewed. All categories were rare except for “English,” “German,” “Irish,” “Italian,” “United States or American,” “Afro-American,” “Mexican,” “White,” and “Other groups.”

The net difference rate was statistically significant for 18 categories. This suggests that the CRS was not independent and/or did not replicate the census very well for those categories.

Households with foreign-born sample persons showed less inconsistency (low) than households with native sample persons (moderate). Respondents who reported on mailback forms showed less inconsistency than respondents who reported to enumerators, although both were moderate.

Households with non-Hispanic sample persons showed less inconsistency than households with Hispanic sample persons, although both were moderate. Households with native sample persons reported with moderate inconsistency. The aggregate index was 34.3 (33.4 to 35.3) and 31.5 percent (30.6 to 32.4) reported a different ancestry group in the CRS. However, households with foreign-born sample persons reported consistently in this situation. The aggregate index was 15.5 (13.9 to 17.2) and 13.8 percent (12.4 to 15.3) changed ancestry groups during the CRS.

Table 20 provides the aggregate response variance measures by census and CRS respondent type. All reported single responses with moderate inconsistency.

Table 20. Aggregate response variance measures for ancestry by respondent type (single response only)

Census	CRS	Inconsistency level	Index of inconsistency	
			Estimate	90-percent confidence interval
Self-response	Self-response	Moderate	29.7	28.4 to 31.1
Self-response	Proxy	Moderate	30.3	27.7 to 33.3
Proxy	Self-response	Moderate	33.2	30.4 to 36.3
Proxy	Same proxy	Moderate	30.2	28.6 to 31.9
Proxy	Different proxy	Moderate	34.3	31.6 to 37.3

We also analyzed the ancestry data for the first ancestry reported in both the census and the reinterview. These responses were collapsed into the same 58 categories as mentioned above. These data were reported with moderate inconsistency. The aggregate index of inconsistency was 40.1 (39.4 to 40.9) and the aggregate GDR was 37.3 percent (36.6 to 37.9). The net

difference rate was statistically different from zero for 19 categories suggesting that one or more of the model assumptions were not met.

Table 21 below examines additional data on the consistency with which persons report ancestry in the census and CRS. For all cases where at least one response is given in both the census and CRS, at least one census response matches one CRS response for 69 percent (68.6 to 69.9) of all persons. The corresponding figure for foreign-born sample persons was 76 percent (74.4 to 78.3) and for native sample persons was 69 percent (67.9 to 69.2). When only a single response was given in both the census and CRS, the responses matched for 64 percent (62.7 to 64.5) of native sample persons and 77 percent (74.7 to 78.6) of foreign-born sample persons.

As shown in Table 21, there were 4,159 cases where no response was given to the ancestry question in the census. This number was only 1,603 for the CRS. Approximately 73.5 percent (72.3 to 74.6) of these census cases were mail returns, while about 26.5 percent (25.4 to 27.7) were enumerator returns.

Table 21. Persons reporting ancestry*

Census response	CRS response	Total Persons#			Native			Foreign born		
		Number	Percent of census category	90-percent confidence interval	Number	Percent of census category	90-percent confidence interval	Number	Percent of census category	90-percent confidence interval
No response (n=4159)	No response	641	15.41	14.49 to 16.33	497	11.95	11.12 to 12.78	4	0.10	0.02 to 0.18
	Single response	2766	66.51	65.30 to 67.71	1923	46.24	44.97 to 47.51	53	1.27	0.99 to 1.56
	Multiple response	752	18.08	17.10 to 19.06	561	13.49	12.62 to 14.36	5	0.12	0.03 to 0.21
Single response (n=10845)	No response	760	7.01	6.60 to 7.41	738	6.80	6.41 to 7.20	18	0.17	0.10 to 0.23
	Single response same	5822	53.68	52.90 to 54.47	4805	44.31	43.52 to 45.09	956	8.82	8.37 to 9.26
	Single response different	3068	28.29	27.58 to 29.00	2750	25.36	24.67 to 26.04	291	2.68	2.43 to 2.94
	Multiple response same†	664	6.12	5.74 to 6.50	645	5.95	5.57 to 6.32	14	0.13	0.07 to 0.19
	Multiple response different	531	4.90	4.56 to 5.24	510	4.70	4.37 to 5.04	13	0.12	0.07 to 0.17
Multiple response (n=4550)	No response	202	4.44	3.94 to 4.94	200	4.40	3.90 to 4.90	2	0.04	0.00 to 0.10
	Single response same@	1371	30.13	29.01 to 31.25	1342	29.49	28.38 to 30.61	25	0.55	0.37 to 0.73
	Single response different	749	16.46	15.56 to 17.37	735	16.15	15.26 to 17.05	9	0.20	0.09 to 0.31
	Multiple response same	1417	31.14	30.01 to 32.27	1398	30.73	29.60 to 31.85	14	0.31	0.17 to 0.44
	Same order	955	20.99	20.00 to 21.98	944	20.75	19.76 to 21.74	6	0.13	0.04 to 0.22
	Different order	462	10.15	9.42 to 10.89	454	9.98	9.25 to 10.71	8	0.18	0.07 to 0.28
	Multiple response one same	719	15.80	14.91 to 16.69	716	15.74	14.85 to 16.62	2	0.04	0.00 to 0.10
	Multiple response both different	92	2.02	1.68 to 2.37	92	2.02	1.68 to 2.37	0	0.00	0.00 to 0.00

* For this table, we replaced any confidence limit that was less than 0.00 with 0.00.

The columns for native and foreign born may not add up to the total persons column because citizenship was not reported for all sample persons.

† Single census response matched one of the CRS multiple responses.

@ Single CRS response matched one of the census multiple responses.

Language usage (CRS15a, 15b, 15c, Census 12a, 12b, 12c)

Three language usage questions were asked on the CRS and census questionnaires. The last two questions were asked of only those persons who spoke a non-English language at home. If the sample person was at least five years of age, then we included their data in the analysis of these questions.

- Speak a language other than English (CRS 15a, Census 12a)

This question asked CRS respondents if the sample person spoke a language other than English at home. These data were reported with moderate inconsistency. The aggregate index was 22.7 (21.6 to 23.9) and 5.7 percent (5.4 to 6.0) of respondents switched answers when reinterviewed. Among the respondents that changed their answers, about 61 percent (58.6 to 63.6) switched from “Yes” in the census to “No” in the CRS. The net difference rate for the “No” category statistically different from zero suggesting that the reinterview may not have been an independent replication of the census. There were more “No” responses found in reinterview.

This question showed less inconsistency in 2000 than in 1990 ($z = -3.9$). In 1990, the inconsistency level was also moderate with an aggregate index of 26.9 (25.6 to 28.3).

Households with male sample persons showed less inconsistency than households with female sample persons, although both were moderate. Respondents who reported to enumerators showed less inconsistency than respondents who reported on mailback forms, although both were moderate.

- Language spoken at home (CRS 15b, Census 12b)

CRS respondents who reported that the sample person spoke a non-English language at home were asked to report that language. The only change to this question was made in the list of examples. “Korean” replaced “Chinese” which was used in the 1990 census. Responses to this question were put into 40 categories including “English only spoken.” These categories are shown in Appendix C and E. These data were reported with low inconsistency. The aggregate index of inconsistency was 17.9 (16.9 to 19.1) and 4.5 percent reported a different language in the reinterview. Of the respondents that changed their answers between the census and the CRS, about 89 percent (87.2 to 91.0) switched between English as the language spoken at home and some other language. The net difference rates for the “English only spoken,” “Spanish or Spanish Creole,” “Other West Germanic,” “Greek,” “Russian,” “Arabic,” and “African languages” categories were statistically significant suggesting that one or more of the model assumptions were not met.

Households with non-Hispanic sample persons showed less inconsistency than households with Hispanic sample persons, although both were moderate. Households with foreign-born sample persons showed less inconsistency (low) than households with native sample persons (moderate).

- English-speaking ability (CRS 15c, Census 12c)

Respondents to the CRS who reported that the sample person spoke a non-English language at home were asked to report how well the sample person spoke English. The CRS data for this question indicated a high level of inconsistency in responses with an aggregate index of 59.5 (56.8 to 62.5). Approximately 37 percent (35.4 to 39.0) of

respondents changed answers during the reinterview. It is not surprising that this question displayed high inconsistency. Opinion questions often show high levels of inconsistency because the respondent may change opinions or perceptions between the two interviews. When evaluating such questions, we cannot determine if the results show response error or if they show changes in opinion.

The significant net difference rate suggests that one or both of the model assumptions (independence and replication) have not been met for the “Very well,” “Well,” and “Not at all” categories.

The inconsistency level for the English-speaking ability question was high in both 2000 and 1990, but their indexes were not significantly different ($z = -0.3$). Table 22 below provides the inconsistency level and aggregate index of inconsistency for this question by decade.

Table 22. Aggregate response variance measures for English-speaking ability by decade

2000			1990		
Index of inconsistency			Index of inconsistency		
Inconsistency level	Estimate	90-percent confidence interval	Inconsistency level	Estimate	90-percent confidence interval
High	59.5	56.8 to 62.5	High	60.3	57.4 to 63.4

Households with non-Hispanic sample persons showed less inconsistency than households with Hispanic sample persons, although both were high. Households with foreign-born sample persons showed less inconsistency than households with native sample persons, although both were high.

Place of birth (CRS 16, Census 13)

Some changes have been made to this question since 1990. Response check boxes were added to distinguish between born in the United States and born outside the United States. Also, separate write-in lines were provided for state of birth and place of birth outside the United States. In 1990, only one write-in line was provided.

The place of birth question requested the CRS respondent to indicate whether the sample person was born inside or outside of the United States. Respondents reported very consistently. The index of inconsistency was 2.7 (2.2 to 3.3) and 0.5 percent (0.4 to 0.5) of respondents changed answers when reinterviewed. Households with male sample persons showed less inconsistency than households with female sample persons, although both were low. Households with native sample persons showed less inconsistency (low) than households with foreign-born sample persons (high). Respondents who reported on mailback forms showed less inconsistency than respondents who reported to enumerators, although both were low.

If the sample person was born in the United States, then the question requested that the respondent report the name of the state in which the sample person was born. If the sample person was born outside of the United States, then the respondent was asked to report the name of the country where the sample person was born. These responses were grouped into 68 categories which are shown in Appendixes C and E. The categories included the 50 states, the District of Columbia, United States territories, and other countries and regions. The aggregate index was 3.2 (3.0 to 3.5) and approximately 3 percent (2.9 to 3.4) of CRS respondents changed answers during the CRS. There was some evidence that one or more of the model assumptions were not met for 12 categories. All subgroups showed low inconsistency. Households with male sample persons showed less inconsistency than households with female sample persons. Households with Hispanic sample persons showed less inconsistency than households with non-Hispanic sample persons. Respondents who reported on mailback forms showed less inconsistency than respondents who reported to enumerators.

We then collapsed the states into four regions of the United States (Northeast, North Central, South, and West), grouping responses into 21 categories. The aggregate index was even lower at 2.3 (2.1 to 2.5). Approximately 1.8 percent (1.6 to 2.0) of CRS respondents changed answers in the reinterview. The net difference rate was significantly different from zero for the “Northeast,” “U.S. state not reported,” and “Asia” categories suggesting that one or more of the model assumptions were not met.

Citizenship (CRS 17, Census 14)

As in the previous CRS, these data were reported very consistently in 2000. The data were significantly less inconsistent in 2000 than in 1990 ($z = -1.3$). Table 23 shows the inconsistency level and aggregate index for both decades.

Table 23. Aggregate response variance measures for citizenship by decade

2000			1990		
Index of inconsistency			Index of inconsistency		
Inconsistency level	Estimate	90-percent confidence interval	Inconsistency level	Estimate	90-percent confidence interval
Low	9.8	9.0 to 10.8	Low	10.9	10.0 to 12.0

In 2000, the aggregate index was 9.8 (9.0 to 10.8) and 1.8 percent (1.7 to 2.0) of CRS respondents changed answers in the reinterview. The categories “Yes, born in Puerto Rico, Guam, the U.S. Virgin Islands, or Northern Marianas” and “Yes, born abroad of American parent or parents” were rare.

The net difference rates were significantly different from zero for the “Yes, U.S. citizen by naturalization” and “No, not a citizen of the United States.” This suggests that the model assumptions of independence and replication may not have been met by the reinterview. The CRS found more respondents reported “Yes, U.S. citizen by naturalization” and fewer respondents reported “No, not a citizen of the United States” than on the census.

All subgroups showed low inconsistency. Households with non-Hispanic sample persons showed less inconsistency than households with Hispanic sample persons. Respondents who reported on mailback forms showed less inconsistency than respondents who reported to enumerators.

Year of entry to the U.S. (CRS 18, Census 15)

If the sample person was not born in the United States, then the respondent was asked what year the sample person came to live in the United States. This question has been modified since 1990. For 2000, this was a write-in question, whereas in 1990 ten response intervals were provided.

As shown in Table 24, the question from Census 2000 showed less inconsistency than the question from the 1990 census ($z = -2.5$).

Table 24. Aggregate response variance measures for year of entry by decade

2000			1990		
Index of inconsistency			Index of inconsistency		
Inconsistency level	Estimate	90-percent confidence interval	Inconsistency level	Estimate	90-percent confidence interval
Low	18.9	17.2 to 20.8	Moderate	23.0	21.1 to 25.2

We grouped the responses to this question into ten categories which are shown in Appendixes C and E. These data were reported with low inconsistency. The aggregate index was 18.9 (17.2 to 20.8) and 16.4 percent (14.9 to 18.0) of respondents changed answers between the census and the CRS. The net difference rates were statistically significant for the “1970 to 1974,” “1960 to 1964,” and “Before 1950” categories suggesting that the reinterview was not an independent replication of the census.

Households with female sample persons showed less inconsistency (low) than households with male sample persons (moderate). Households with non-Hispanic sample persons showed less inconsistency (low) than households with Hispanic sample persons (moderate). Respondents who reported on mailback forms showed less inconsistency (low) than respondents who reported to enumerators (moderate).

Migration (CRS 19a, 19b, Census 16a, 16b)

The CRS asked two migration questions. These questions ask about place of residence on April 1, 1995. Both questions have been slightly modified since 1990.

- Live at current residence on April 1, 1995 (CRS 19a, Census 16a)

This question asked if the sample person lived at their current residence on April 1, 1995. For 2000, a separate write-in line was added for places outside the United States, whereas in 1990 this was combined with the United States write-in line.

Respondents answered this question with moderate inconsistency. The aggregate index of inconsistency was 22.2 (21.4 to 22.9). The index was low for the “Person is under 5 years old” category and moderate for the “Yes, this house,” “No, outside the United States,” and “No, different house in the United States” categories. The rare category “No, outside th United States” had the highest index, at 40.2 (36.7 to 44.0).

Approximately 12 percent (11.7 to 12.5) of CRS respondents changed answers. Among the respondents that changed answers when reinterviewed, approximately 70 percent (67.9 to 71.2) changed between “Yes, this house” and “No, different house in the United States.” The net difference rate was statistically different from zero for the “Yes, this house” and “No, different house in the United States” categories. The significant net difference rates show us that one or both of the model assumptions, independence and replication, were not met.

Households with non-Hispanic sample persons showed less inconsistency than households with Hispanic sample persons, although both were moderate. Households with native sample persons showed less inconsistency than households with foreign-born sample persons, although both were moderate. Respondents who reported on mailback forms showed less inconsistency than respondents who reported to enumerators, although both were moderate.

- Where lived in U.S. on April 1, 1995 (CRS 19b, Census 16b)

If the sample person was reported as living in a different house in the United States on April 1, 1995, then the respondent was asked where the sample person lived. Some changes have been made to this question. The respondent was asked for the zip code and the sequence of city, county, and state write-in lines were reordered for 2000.

After the respondent reported the city, town, or post office of where the sample person lived on April 1, 1995, they were then asked if the sample person lived inside the limits of that city or town. Respondents answered this question with high inconsistency. The index of inconsistency was 52.1 (49.4 to 55.1) and 16.1 percent (15.2 to 17.0) of respondents changed answers when reinterviewed. Approximately 56 percent (53.1 to 59.1) of the respondents that changed answers switched from “No” in the census to “Yes” in the CRS. The net difference rate was statistically significant for this question suggesting that at least one of the model assumptions was not met. The reinterview found more “Yes” responses.

Households with non-Hispanic sample persons showed less inconsistency than households with Hispanic sample persons, although both were high. Households with native sample persons showed less inconsistency than households with foreign-born sample persons, although both were high.

- Place of residence on April 1, 1995

If the sample person did not live at their current residence on April 1, 1995, then the respondent was asked to report the state or country where the sample person lived. These responses were grouped into the 68 categories shown in Appendixes C and E. These data were reported very consistently. The categories included the 50 states, the District of Columbia, United States territories, and other countries and regions. The aggregate index of inconsistency was 4.4 (3.9 to 4.9) and approximately 4 percent (3.7 to 4.7) of CRS respondents changed answers. The net difference rate for the “Arizona,” “Colorado,” and “Tennessee” categories were significantly different from zero suggesting that the reinterview was not independent and/or did not replicate the census conditions very well. All subgroups showed low inconsistency. Households with Hispanic sample persons showed less inconsistency than households with non-Hispanic sample persons.

We then collapsed the states into four regions of the United States (Northeast, North Central, South, and West), grouping responses into 21 categories. The aggregate index was even lower at 3.0 (2.5 to 3.5). Approximately 2 percent (1.9 to 2.6) of respondents changed answers in the reinterview.

Disability (CRS 20a, 20b, 21a, 21b, 21c, 21d, Census 17a, 17b, 18a, 18b, 18c, 18d)

On the census and the CRS there were two disability questions with subparts, which resulted in a total of six disability items. The 2000 questions changed significantly from the 1990 questions. New 2000 questions covered the major life activities of seeing and hearing and the ability to perform physical and mental tasks. Unless otherwise stated, these questions collected data on the disability of children five years and over as well as adults. The 1990 questions collected data only for persons 15 years and over.

- Sensory impairment (CRS 20a, Census 17a)

This question asked the respondent if the sample person had any blindness, deafness, or a severe vision or hearing impairment. These data were reported with moderate inconsistency between the census and the reinterview. The aggregate index of inconsistency was 47.2 (44.2 to 50.5) and 3.7 percent (3.5 to 4.0) of respondents changed answers when reinterviewed. Of the respondents that changed answers, approximately 63 percent (59.4 to 65.8) switched from “No” to “Yes.” The net difference rate for the “Yes” category was statistically different from zero. This shows us that one or both of the model assumptions were not met. There were more “Yes” responses given during the CRS than the census.

Households with non-Hispanic sample persons showed less inconsistency (moderate) than households with Hispanic sample persons (high). Respondents who reported on mailback forms showed less inconsistency (moderate) than respondents who reported to enumerators (high).

- Physical limitations (CRS 20b, Census 17b)

The respondent was asked if the sample person had a condition that substantially limits one or more basic physical activities such as walking, climbing stairs, reaching, lifting, or carrying. This question was reported with moderate inconsistency. The aggregate index was 42.0 (40.0 to 44.1) and approximately 7 percent (6.5 to 7.1) of CRS respondents changed answers. Of the respondents that changed answers during the CRS, approximately 58 percent (55.4 to 60.3) switched from “No” to “Yes.” The net difference rate for this question was statistically different from zero suggesting that one or more of the model assumptions were not met.

Households with female sample persons showed less inconsistency than households with male sample persons, although both were moderate. Households with non-Hispanic sample persons showed less inconsistency (moderate) than households with Hispanic sample persons (high). Households with native sample persons showed less inconsistency (moderate) than households with foreign-born sample persons (high). Respondents who reported on mailback forms showed less inconsistency than respondents who reported to enumerators, although both were moderate.

- Difficulty in learning, remembering, or concentrating (CRS 21a, Census 18a)

This question asked if the sample person had any difficulty in learning, remembering, or concentrating because of a physical, mental, or emotional condition lasting six months or more. Overall, there was high inconsistency in the responses. The aggregate index of inconsistency was 54.4 (51.3 to 57.7) and approximately 5 percent (4.6 to 5.2) of respondents changed answers between the census and the reinterview.

Households with non-Hispanic sample persons showed less inconsistency than households with Hispanic sample persons, although both were high. Respondents who reported on mailback forms showed less inconsistency than respondents who reported to enumerators, although both were high.

- Difficulty in dressing, bathing, or getting around home (CRS 21b, Census 18b)

This question asked if the sample person had any difficulty in dressing, bathing, or getting around inside the home because of a physical, mental, or emotional condition lasting six months or more. Respondents reported with high inconsistency. The aggregate index was 51.7 (47.7 to 56.1) and 2.6 percent (2.4 to 2.8) of respondents switched answers in the CRS. The net difference rate was statistically different from zero suggesting that the CRS did not meet one or more of the model assumptions. The reinterview found more “No” responses.

This question showed less inconsistency in 2000 than in 1990 ($z = -6.0$). The inconsistency level was also high in 1990 with an aggregate index of 73.6 (69.5 to 78.0).

Households with female sample persons showed less inconsistency (moderate) than households with male sample persons (high). Households with non-Hispanic sample persons showed less inconsistency (moderate) than households with Hispanic sample persons (high). Households with native sample persons showed less inconsistency than households with foreign-born sample persons, although both were high. Respondents who reported on mailback forms showed less inconsistency (moderate) than respondents who reported to enumerators (high).

- Difficulty in going outside the home (CRS 21c, Census 18c)

Respondents were asked if the sample person had any difficulty in going outside the home alone to shop or visit a doctor's office because of a physical, mental, or emotional condition lasting six months or more. This question collected data of sample persons sixteen years old and over. This question suffered from a high level of inconsistency. The aggregate index was 64.5 (61.3 to 67.9) and 8.0 percent (7.6 to 8.4) of respondents changed answers between the census and the reinterview. The net difference rate for this question was statistically significant suggesting that the CRS was not independent and/or did not replicate the census conditions very well.

This question showed less inconsistency in 1990 than in 2000 ($z = 6.4$). The 1990 question showed moderate inconsistency with an aggregate index of 47.1 (44.2 to 50.2).

Households with female sample persons showed less inconsistency than households with male sample persons, although both were high. Households with non-Hispanic sample persons showed less inconsistency than households with Hispanic sample persons, although both were high. Households with native sample persons showed less inconsistency than households with foreign-born sample persons, although both were high.

- Difficulty working at a job or business (CRS 21d, Census 18d)

This question asked if the sample person had any difficulty working at a job or business because of a physical, mental, or emotional condition lasting six months or more. This question collected data of sample persons sixteen years old and over. This question showed high inconsistency. The aggregate index was 80.5 (78.0 to 83.0) and approximately 18 percent (17.5 to 18.6) of respondents changed answers when reinterviewed. The net difference rate for this question was statistically different from zero. This suggested that the reinterview did not meet one or more of the model assumptions. The reinterview found more "Yes" responses.

Households with non-Hispanic sample persons showed less inconsistency than households with Hispanic sample persons, although both were high. Households with native sample persons showed less inconsistency than households with foreign-born sample persons, although both were high. Respondents who reported on mailback forms showed less inconsistency than respondents who reported to enumerators, although both were high.

Grandparents as caregivers (CRS 23a, 23b, 23c, Census 20a, 20b, 20c)

These questions were new for 2000. There were three questions asked on this subject. These questions collected data of sample persons fifteen years old and over.

- Grandchildren live here (CRS 23a, Census 20a)

This question asked if the sample person had any of their grandchildren under the age of eighteen living with them on April 1, 2000. These data were reported with moderate inconsistency. The aggregate index of inconsistency was 25.8 (23.0 to 28.8) and 1.6 percent (1.4 to 1.8) of respondents switched answers between the census and the CRS. The net difference rate for this question was statistically significant suggesting that the reinterview did not meet one or more of the model assumptions. The CRS found more “No” responses.

Households with female sample persons showed less inconsistency than households with male sample persons, although both were moderate. Households with non-Hispanic sample persons showed less inconsistency than households with Hispanic sample persons, although both were moderate. Households with native sample persons showed less inconsistency than households with foreign-born sample persons, although both were moderate.

- Responsible for grandchildren (CRS 23b, Census 20b)

If the sample person had any of their grandchildren living with him or her on April 1, 2000, then the respondent was asked if the sample person was responsible for most of the basic needs of these grandchildren. Respondents answered this question with moderate inconsistency. The aggregate index was 46.1 (39.7 to 53.8) and 22.6 (19.1 to 26.1) of CRS respondents changed answers.

Households with male sample persons showed less inconsistency (moderate) than households with female sample persons (high).

- How long responsible (CRS 23c, Census 20c)

If the respondent reported that the sample person was responsible for most of the basic needs of any grandchildren under the age of eighteen who lived with them on April 1, 2000, then the respondent was asked this question. This question asked how long the sample person was responsible for the grandchildren living with them. If the sample person was financially responsible for more than one grandchild, then the respondent was instructed to answer the question for the grandchild for whom the sample person had been responsible for the longest period of time. This question exhibited a high level of inconsistency. The aggregate index was 53.7 (45.5 to 64.6) and approximately 40 percent (33.1 to 47.4) of respondents changed answers when reinterviewed.

Military service (CRS 24a, 24b, 24c, Census 21a, 21b, 21c)

Three questions were asked about military service. These questions collected data of sample persons fifteen years old and over.

- Veteran status (CRS 24a, Census 21a)

This question has been modified since 1990. The 2000 instruction explained the meaning of “active duty” for the Reserves and National Guard with special emphasis on “activation,” whereas the 1990 instruction merely referred to the respondent instruction guide. The Reserves or National Guard response category was changed from a “Yes” to a “No” option.

As shown in Table 25 below, the 1990 question showed less inconsistency than the 2000 question ($z = 11.9$).

Table 25. Aggregate response variance measures for veteran status by decade

Inconsistency level	2000			1990		
	Index of inconsistency			Index of inconsistency		
	Estimate	90-percent confidence interval		Estimate	90-percent confidence interval	
Low	18.7	17.5 to 20.0		8.5	7.9 to 9.2	

In 2000, respondents answered this question with low inconsistency. The aggregate index was 18.7 (17.5 to 20.0). The rare categories “Yes, now on active duty” and “No, training for Reserves or National Guard only” were in the high range while the indexes for the other two categories were in the low range. The index of inconsistency for the category “Yes, now on active duty” may be affected by the reference period “now” because it refers to one time period for the census and another for the CRS.

About 4.8 percent (4.5 to 5.1) of respondents changed answers when reinterviewed. Of the respondents that changed answers, about 48 percent (44.3 to 50.9) switched between “No, training for Reserves or National Guard only” and “No, never served in the military.” The net difference rate for all categories were statistically different from zero suggesting that the reinterview did not meet one or both of the model assumptions (independence and replication).

We analyzed this question by sex and citizenship status. We found that households with male sample persons showed less inconsistency (low) than households with female sample persons (high). Also, we found that households with native sample persons showed less inconsistency (low) than households with foreign-born sample persons (moderate). Tables 26 and 27 contain the aggregate index of inconsistency and the index for each category for this question by sex and citizenship status, respectively.

Table 26. Index of inconsistency for veteran status by sex

Reinterview Classification	Male			Female		
	Inconsistency level	Estimate	90-percent confidence interval	Inconsistency level	Estimate	90-percent confidence interval
Yes, now on active duty	High	60.3	50.7 to 71.7	High	66.8	44.9 to 99.2
Yes, on active duty in past, but not now	Low	12.2	11.0 to 13.4	Moderate	22.5	17.2 to 29.5
No, training for Reserves or National Guard only	High	67.1	59.5 to 75.6	High	93.5	83.0 to 100.0
No, never served in the military	Low	9.9	8.9 to 11.0	High	56.2	50.3 to 62.8
Aggregate	Low	15.5	14.3 to 16.8	High	59.3	53.2 to 66.1

Table 27. Index of inconsistency for veteran status by citizenship status

Reinterview Classification	Native			Foreign Born		
	Inconsistency level	Estimate	90-percent confidence interval	Inconsistency level	Estimate	90-percent confidence interval
Yes, now on active duty	High	60.9	51.8 to 71.6	High	62.6	27.8 to 100.0
Yes, on active duty in past, but not now	Low	11.0	10.0 to 12.1	Moderate	21.5	13.9 to 33.2
No, training for Reserves or National Guard only	High	77.0	70.6 to 84.0	High	93.0	63.6 to 100.0
No, never served in the military	Low	13.8	12.7 to 14.9	Moderate	26.8	19.2 to 37.4
Aggregate	Low	18.4	17.2 to 19.7	Moderate	33.4	24.8 to 45.0

- Period of military service (CRS 24b, Census 21b)

If the sample person had ever served on active duty in the U.S. Armed Forces, military Reserves, or National Guard, then the respondent was asked when the sample person served on active duty. Some modifications were made to this question in 2000. The two categories covering the period from August 1990 to 2000 were added and the category “World War I” was dropped in 2000.

Respondents were allowed to report each period served by the sample person. We treated each response category as a separate “Yes/No” question, analyzing each category as whether it was marked or not. For example, we treated the “April 1995 or later” category as the question “Did (you/...) serve on active duty in the U.S. Armed Forces during April 1995 or later?”. If the “April 1995 or later” category was marked on the questionnaire, then we treated that response as “Yes,” otherwise we treated the response as “No.”

The categories “World War II,” “Vietnam era,” and “Korean conflict” displayed low levels of inconsistency; “April 1995 or later,” “August 1990 to March 1995,” “September 1980 to July 1990,” and “February 1955 to July 1964” displayed moderate levels of inconsistency; and the rare category “Some other time” displayed a high level of inconsistency. Table 28 below contains aggregate response variance measures for each response category.

The 1990 question showed less inconsistency than the 2000 question for all categories except “February 1955 through July 1964” and “Some other time.” For these two categories, the inconsistency level remained the same (moderate and high, respectively) in 2000, and their indexes were not significantly different at the 90-percent confidence level.

Table 28 provides the inconsistency level and aggregate index for each response category by decade.

Respondents who reported on mailback forms showed less inconsistency than respondents who reported to enumerators for the “Vietnam era,” “February 1955 to July 1964,” and “Korean conflict” categories. Households with female sample persons showed less inconsistency than households with male sample persons for the “April 1995 or later” and “World War II” categories.

Table 28. Aggregate response variance measures for period of military service by decade

Reinterview classification	2000			1990		
	Index of inconsistency			Index of inconsistency		
	Inconsistency level	Estimate	90-percent confidence interval	Inconsistency level	Estimate	90-percent confidence interval
April 1995 or later	Moderate	35.2	28.3 to 43.7	-	-	-
August 1990 to March 1995 (including Persian Gulf War)	Moderate	29.7	24.8 to 35.5	-	-	-
September 1980 to July 1990	Moderate	29.5	25.2 to 34.6	Low	18.2	14.4 to 23.0
May 1975 to August 1980	Moderate	44.9	38.7 to 52.1	Moderate	24.9	20.8 to 29.7
Vietnam era (August 1964 to April 1975)	Low	17.3	14.9 to 20.2	Low	7.5	6.1 to 9.1
February 1955 to July 1964	Moderate	31.5	27.4 to 36.2	Moderate	34.6	31.5 to 38.1
Korean conflict (June 1950 to January 1955)	Low	17.2	14.2 to 20.8	Low	8.2	6.6 to 10.2
World War II (September 1940 to July 1947)	Low	7.8	6.1 to 9.9	Low	3.4	2.6 to 4.5
Some other time	High	93.0	74.7 to 100.0	High	93.7	84.4 to 100.0

- Not applicable

- Years of military service (CRS 24c, Census 21c)

This question asked how many years the sample person served on active duty. The 2000 question included two categories – “Less than 2 years” and “2 years or more.” In 1990, respondents were asked to write-in the exact number of years that the sample person had served on active duty.

The 2000 question showed less inconsistency than the 1990 question ($z = -2.5$). Table 29 gives the inconsistency level and the aggregate index by decade.

Table 29. Aggregate response variance measures for years of military service by decade

Inconsistency level	2000		1990		
	Index of inconsistency		Index of inconsistency		
	Estimate	90-percent confidence interval	Estimate	90-percent confidence interval	
Moderate	41.6	36.3 to 47.6	High	58.8	48.9 to 68.7

In 2000, this question showed moderate inconsistency. The aggregate index of inconsistency was 41.6 (36.3 to 47.6) and approximately 10 percent (8.6 to 11.2) of

respondents changed categories during the reinterview. The net difference rate for this question was statistically different from zero. There were more “2 years or more” responses given during the CRS. The significant net difference rate provides evidence that the reinterview was not an independent replication of the original interview. Households with female sample persons showed less inconsistency than households with male sample persons, although both were moderate.

Work experience in 1999 (CRS 25a, 25b, 25c, Census 31a, 31b, 31c)

In 2000, the census and CRS asked three questions relating to work experience in 1999. These questions collected data of sample persons fifteen years old or over.

- Work last year (CRS 25a, Census 31a)

This question asked if the sample person had worked at a job or business at any time in 1999. The 2000 question eliminated the 1990 references to work on a farm and to a “paid” job. It replaces the 1990 phrase “even for a few days” with “at any time.”

As shown in Table 30 below, the 2000 question showed less inconsistency than the 1990 question ($z = -17.3$).

Table 30. Aggregate response variance measures for work last year by decade

Inconsistency level	2000		1990		
	Index of inconsistency		Index of inconsistency		
	Estimate	90-percent confidence interval	Inconsistency level	Estimate	90-percent confidence interval
Moderate	24.3	22.8 to 25.9	Moderate	45.9	44.6 to 47.3

This question was reported with moderate inconsistency in 2000. The aggregate index was 24.3 (22.8 to 25.9) and 6.7 percent (6.3 to 7.1) of CRS respondents changed answers. The net difference rate was statistically significant for this question suggesting that one or both of the model assumptions (independence and replication) were not met. The reinterview found fewer “Yes” responses.

Households with female sample persons showed less inconsistency than households with male sample persons, although both were moderate. Households with non-Hispanic sample persons showed less inconsistency than households with Hispanic sample persons, although both were moderate. Households with native sample persons showed less inconsistency than households with foreign-born sample persons, although both were moderate. Respondents who reported on mailback forms showed less inconsistency than respondents who reported to enumerators, although both were moderate.

- Weeks worked last year (CRS 25b, Census 31b)

If the respondent reported that the sample person worked at a job or business in 1999, then the respondent was asked how many weeks the sample person worked in 1999. The respondent was instructed to count paid vacation, paid sick leave, and military service in the total. The number of weeks was reported as a write-in. We grouped the data into the following six categories:

- 1 to 13 weeks
- 14 to 26 weeks
- 27 to 39 weeks
- 40 to 47 weeks
- 48 to 49 weeks
- 50 to 52 weeks

This question showed high inconsistency in 1990 with an aggregate index of 56.8 (55.4 to 58.3). The inconsistency level for this question remained the same in 2000, and the indexes were not significantly different at the 90-percent confidence level ($z = 0.5$). In 2000, the aggregate index was 57.5 (55.5 to 59.6) and 23.1 percent (22.3 to 23.9) of respondents changed answers when reinterviewed. The net difference rates for all categories except “14 to 26 weeks” were statistically different from zero. This shows that one or both of the model assumptions, independence or replication, were not met by the reinterview.

Households with non-Hispanic sample persons showed less inconsistency than households with Hispanic sample persons, although both were high. Households with native sample persons showed less inconsistency than households with foreign-born sample persons, although both were high. Respondents who reported on mailback forms showed less inconsistency than respondents who reported to enumerators, although both were high.

- Usual hours worked each week (CRS 25c, Census 31c)

If the sample person worked at a job or business in 1999, then respondents were asked to report how many hours the sample person usually worked each week in 1999. This question was modified slightly from 1990. In the response field, the reminder “Usual hours worked each WEEK” was used in 2000. In 1990, just “Hours” was used. The number of hours was collected as a write-in. We grouped the responses into the following three categories:

- 1 to 14 hours
- 15 to 34 hours
- 35 hours or more

These data exhibited moderate inconsistency. The aggregate index was 34.3 (32.4 to 36.2) and 10.6 percent (10.0 to 11.2) of CRS respondents changed answers. The net

difference rates for all three categories were statistically different from zero suggesting that the CRS was not independent and/or did not replicate the census very well.

This question showed less inconsistency in 2000 than in 1990 ($z = -3.9$). The aggregate index was 40.1 (38.6 to 41.7) in 1990.

Households with female sample persons showed less inconsistency than households with male sample persons, although both were moderate. Households with non-Hispanic sample persons showed less inconsistency than households with Hispanic sample persons, although both were moderate. Households with native sample persons showed less inconsistency (moderate) than households with foreign-born sample persons (high). Respondents who reported on mailback forms showed less inconsistency than respondents who reported to enumerators, although both were moderate.

Income (CRS 26a-26h, 27, Census 32a-32h, 33)

In the CRS, nine questions were asked about sources of income received during 1999 by the sample person. These questions collected data for sample persons 15 years old and over. Respondents were given the following instructions:

- If the net income was a loss, give the dollar amount of the loss.
- For income received jointly, report, if possible, the appropriate share for the sample person; otherwise, report the whole amount if the sample person was the primary recipient, “No” otherwise.
- If the exact amount is not known, please give best estimate.

The following revisions were made to some of the income questions in 2000:

- In 1990, nonfarm self-employment income and farm self-employment income were two separate questions, whereas in 2000 these questions were combined into one.
- In 1990, Supplemental Security Income (SSI) was combined with other public assistance income. In 2000, these income types were asked separately.
- For 2000, reference to “Aid to Families with Dependent Children” (AFDC) was dropped in the public assistance question.

Table 31, following the subsection on total income, contains aggregate response variance measures for each income question by respondent type.

- Wages, salary, commissions, bonuses or tips (CRS 26a, Census 32a)

CRS respondents were asked if the sample person received any wages, salary, commissions, bonuses, or tips in 1999. These data were reported with moderate inconsistency. The index was 21.2 (20.0 to 22.4) and approximately 10 percent (9.4 to 10.5) of respondents changed answers when reinterviewed. The net difference rate for this question was statistically significant. This shows that one or both of the model assumptions, independence or replication, were not met by the reinterview. There were

more “No” responses in reinterview.

Households with female sample persons showed less inconsistency (low) than households with male sample persons (moderate). Households with non-Hispanic sample persons showed less inconsistency than households with Hispanic sample persons, although both were moderate. Households with native sample persons showed less inconsistency than households with foreign-born sample persons, although both were moderate. Respondents who reported on mailback forms showed less inconsistency than respondents who reported to enumerators, although both were moderate.

If the respondent reported that the sample person received any wages, salary, commissions, bonuses, or tips in 1999, then the respondent was asked to report the amount received from all jobs before deductions for taxes, bonds, dues, or other items. This was a write-in question. The responses to this question were grouped into twelve categories which are shown in Appendixes C and E. The level of inconsistency in this question was moderate. The aggregate index of inconsistency was 48.0 (46.7 to 49.2) and 43.7 percent (42.6 to 44.8) of CRS respondents changed answers. The categories “\$100,000 to \$199,999” and “\$200,000 or more” were rare. The net difference rate for the “\$1 to \$9,999” and “\$55,000 to \$64,000” categories were statistically different from zero.

Households with female sample persons showed less inconsistency (moderate) than households with male sample persons (high). Households with native sample persons showed less inconsistency (moderate) than households with foreign-born sample persons (high). Respondents who reported on mailback forms showed less inconsistency (moderate) than respondents who reported to enumerators (high).

- Self-employment income (CRS 26b, Census 32b)

This question asked if the sample person had any self-employment income from nonfarm or farm businesses in 1999. The data from this question exhibited a moderate level of inconsistency. The aggregate index of inconsistency was 44.4 (41.4 to 47.5) and 6.3 percent (5.9 to 6.7) of respondents changed answers in the CRS. The net difference rate for this question was statistically significant.

Households with male sample persons showed less inconsistency (moderate) than households with female sample persons (high). Households with non-Hispanic sample persons showed less inconsistency (moderate) than households with Hispanic sample persons (high). Respondents who reported on mailback forms showed less inconsistency (moderate) than respondents who reported to enumerators (high).

If the sample person had received any self-employment income, then the respondent was asked to report the net income after business expenses. We collected the responses to this question as numerical data and then we converted the data into twelve categories which are shown in Appendixes C and E. This question was reported with moderate inconsistency. The aggregate index was 45.3 (41.2 to 49.8) and 7.0 percent (6.4 to 7.6) of

respondents changed answers during the reinterview. All categories were rare except “\$1 to \$499 or loss.” The net difference rates were statistically significant for the “\$1 to \$499 or loss,” “5,000 to \$9,999,” and “\$20,000 to \$29,999” categories suggesting that one or more of the model assumptions were not met.

Respondents who reported on mailback forms showed less inconsistency (moderate) than respondents who reported to enumerators (high).

- Interest, dividends, net rental income, royalty income, or income from estates and trusts (CRS 26c, Census 32c)

This question asked CRS respondents if the sample person received any interest, dividends, net rental income, royalty income, or income from estates and trusts in 1999. Respondents were instructed to report even small amounts credited to an account. This question displayed a high level of inconsistency. The index was 58.0 (56.1 to 60.0) and approximately 20 percent (18.9 to 20.2) of CRS respondents switched answers.

All subgroups showed high inconsistency. Households with male sample persons showed less inconsistency than households with female sample persons. Households with non-Hispanic sample persons showed less inconsistency than households with Hispanic sample persons. Respondents who reported on mailback forms showed less inconsistency than respondents who reported to enumerators.

If the respondent reported that the sample person had received interest, dividends, etc. in 1999, then the respondent was asked to report the dollar amount. This was a write-in question and we grouped the responses into the twelve categories shown in Appendixes C and E. The aggregate index of inconsistency was 44.7 (42.4 to 47.2) and 15.8 percent (15.0 to 16.7) of respondents changed answers between the census and CRS. All categories were rare except “\$1 to \$24 or loss,” “\$200 to \$499,” and “\$15,000 or more.” The net difference rates for the “\$1 to \$24 or loss,” “\$200 to \$499,” “\$500 to \$999,” and “\$2,000 to \$2,499” categories were statistically different from zero. This shows us that the reinterview may not have been an independent replication of the census.

Households with Hispanic sample persons showed less inconsistency than households with non-Hispanic sample persons, although both were moderate.

- Social Security or Railroad Retirement income (CRS 26d, Census 32d)

This question asked if the sample person received any Social Security or Railroad Retirement income in 1999. These data were reported very consistently. The index of inconsistency was 13.4 (12.3 to 14.7) and 3.5 percent (3.2 to 3.7) of respondents switched answers when reinterviewed. The net difference rate for the “Yes” category was statistically significant. There were more “Yes” responses given during the CRS.

Households with male sample persons showed less inconsistency than households with female, sample persons, although both were low. Households with non-Hispanic sample

persons showed less inconsistency (low) than households with Hispanic sample persons (moderate). Households with native sample persons showed less inconsistency (low) than households with foreign-born sample persons (moderate). Respondents who reported on mailback forms showed less inconsistency (low) than respondents who reported to enumerators (moderate).

If the sample person was reported to have received Social Security or Railroad retirement in 1999, then the respondent was asked to report the amount. We collected the responses to this question as numerical data and grouped the responses into the twelve categories shown in Appendixes C and E. This question suffered from a high level of inconsistency. The aggregate index was 60.4 (58.2 to 62.7) and approximately 56 percent (54.2 to 58.4) of respondents reported a different dollar amount in the CRS. The categories “\$2,000 to \$2,999” and “\$20,000 or more” were rare. The net difference rates were statistically significant for the six of the twelve categories, suggesting that one or both of the reinterview model assumptions (independence and replication) were not met .

- Supplemental Security Income (CRS 26e, Census 32e)

Respondents were asked if the sample person received any Supplemental Security Income (SSI) in 1999. This question displayed a high level of inconsistency. The index was 48.2 (43.3 to 53.6) and 2.2 percent (1.9 to 2.4) of CRS respondents changed answers.

The category “Yes” was rare. About 4.6 percent (4.3 to 4.9) of respondents reported that the sample person received SSI in 1999 in either the census or the CRS.

The net difference rate for this question was statistically different from zero suggesting that one or both of the model assumptions were not met.

Households with female sample persons showed less inconsistency (moderate) than households with male sample persons (high). Households with foreign-born sample persons showed less inconsistency (moderate) than households with native sample persons (high).

If the respondent reported that the sample person had received SSI in 1999, then the respondent was asked to report the dollar amount. This was a write-in question. We grouped the responses into twelve categories shown in Appendixes C and E. These data were reported with a high level of inconsistency. The aggregate index of inconsistency was 55.6 (48.3 to 65.3). The categories “\$10,000 to \$10,999,” “\$12,000 to \$12,999,” and “\$13,000 to \$13,999” were rare. Approximately 46 percent (39.3 to 53.5) of CRS respondents changed answers. The net difference rates for the “\$1 to \$999” and “\$8,000 to \$8,999” categories were statistically significant.

- Public assistance or welfare payments (CRS 26f, Census 32f)

Respondents were asked if the sample person had received any public assistance or welfare payments from the state or local welfare office in 1999. The level of

inconsistency was in the high range. The aggregate index was 53.9 (48.0 to 60.7) and 1.8 percent (1.6 to 2.0) of respondents changed answers when reinterviewed.

The “Yes” category was rare. Only 3.3 percent (3.0 to 3.6) of respondents reported that the sample person received any public assistance or welfare payments in 1999 in either interview.

Households with female sample persons showed less inconsistency (moderate) than households with male sample persons (high).

Respondents who reported that the sample person had received public assistance or welfare payments were asked to report the dollar amount of those payments. This was a write-in question. We grouped responses to these questions into twelve categories as shown in Appendixes C and E. These data were reported with high inconsistency. The aggregate index of inconsistency was 61.7 (53.1 to 74.1) and approximately 53 percent (43.8 to 61.8) of respondents changed answers in the reinterview. The categories “\$9,000 to \$9,999,” “\$10,000 to \$10,999,” “\$13,000 to \$13,999,” and “\$15,000 or more” were rare.

The net difference rates were statistically significant for the “\$1 to \$999,” “\$3,000 to \$3,999,” and “\$5,000 to \$5,999” categories. This suggests that at least one of the model assumptions was not met by the reinterview.

- Retirement, survivor, or disability pensions (CRS 26g, Census 32g)

This question asked if the sample person received retirement, survivor, or disability pensions in 1999. Respondents were instructed not to include Social Security. These data were reported with moderate inconsistency. The index was 36.8 (34.3 to 39.3) and 5.5 percent (5.1 to 5.8) of respondents changed answers during the CRS.

Households with non-Hispanic sample persons showed less inconsistency (moderate) than households with Hispanic sample persons (high). Households with native sample persons showed less inconsistency (moderate) than households with foreign-born sample persons (high). Respondents who reported on mailback forms showed less inconsistency (moderate) than respondents who reported to enumerators (high).

If the sample person had received retirement, survivor, or disability pensions in 1999, then the respondent was asked to report the dollar amount. The level of inconsistency in this question was moderate. The aggregate index of inconsistency was 42.0 (38.7 to 45.9) and 36.7 percent (33.5 to 39.9) of CRS respondents reported a different dollar amount from the census. The categories “\$500 to \$749” and “\$750 to \$999” were rare.

The net difference rates for the “\$1 to \$499,” “\$1,000 to \$2,499,” “\$15,000 to \$19,999,” and “\$50,000 or more” were statistically significant. The significant net difference rates provides evidence that the reinterview was not an independent replication of the original interview.

- Other sources of income (CRS 26h, Census 32h)

This question asked if the sample person received any other sources of income regularly such as Veterans' payments, unemployment compensation, child support, or alimony in 1999. Respondents were instructed not to include lump-sum payments such as money from an inheritance or sale of a home. The data from this question exhibited a high level of inconsistency. The index was 60.7 (56.7 to 65.1) and approximately 5 percent (4.9 to 5.6) of respondents changed answers when reinterviewed.

Households with non-Hispanic sample persons showed less inconsistency than households with Hispanic sample persons, although both were high. Households with native sample persons showed less inconsistency than households with foreign-born sample persons, although both were high. Respondents who reported on mailback forms showed less inconsistency than respondents who reported to enumerators, although both were high.

If the sample person had received other regular sources of income, then the respondent was asked to report the dollar amount. This too was a write-in question and we grouped responses into the twelve categories shown in Appendixes C and E. These data were reported with a moderate level of inconsistency. The aggregate index was 49.6 (44.1 to 56.5) and approximately 45 percent (39.5 to 50.8) of CRS respondents reported a different answer. The categories "\$11,000 to \$11,999," "\$12,000 to \$12,999," "\$13,000 to \$13,999," and "\$14,000 to \$14,999" were rare.

The net difference rates for the "\$1 to \$499" and "\$3,000 to \$3,999" categories were statistically significant suggesting that one or both of the model assumptions were not met.

- Total income (CRS 27, Census 33)

This question asked for the sample person's total income received in 1999. On census enumerator forms and the CRS, enumerators were instructed to not ask this question if the previous eight income questions were completed. Instead, the enumerators were instructed to sum the previous eight entries and subtract any losses and to enter the amount as the total. If the total was a loss, then the enumerator was instructed to mark the "Loss" box next to the amount. As a result of these instructions, the respondent may not have answered this question in either the census or the CRS.

This question asked for the sample person's total income in 1999. On the CRS, enumerators were to mark the "None" box if the sample person received no income in 1999. We analyzed this by whether the "None" box was marked or not. The level of inconsistency was high. The index was 58.0 (55.8 to 60.4) and the GDR was 11.3 percent (10.8 to 11.7). The net difference rate was statistically different than zero suggesting that at least one of the model assumptions (independence and replication) was not met.

We analyzed the annual amount of total income reported. We collected the responses as numerical data and grouped the responses into twelve categories as shown in Appendixes C and E. These data were reported with moderate inconsistency. The aggregate index of inconsistency was 46.0 (45.0 to 47.1) and the aggregate GDR was 31.9 percent (31.1 to 32.6). The categories “\$45,000 to \$49,999,” “\$65,000 to \$74,999,” “\$75,000 to \$99,999,” “\$100,000 to \$199,999,” or “\$200,000 or more” were rare. The net difference rates were statistically different from zero for the “\$1 to \$9,999 or loss,” “\$10,000 to \$14,999,” “\$15,000 to \$19,999,” and “\$20,000 to \$24,999” categories.

Households with female sample persons showed less inconsistency than households with male sample persons, although both were moderate. Households with native sample persons showed less inconsistency (moderate) than households with foreign-born sample persons (high). Respondents who reported on mailback forms showed less inconsistency (moderate) than respondents who reported to enumerators (high).

Table 31. Aggregate response variance measures for income by respondent type

Census	CRS	Inconsistency level	Gross difference rate		Index of inconsistency	
			Estimate	90-percent confidence interval	Estimate	90-percent confidence interval
Amount received from wages, salary, commissions, bonuses or tips in 1999						
Self-response	Self-response	Moderate	42.3	40.8 to 43.9	46.2	44.6 to 47.9
Self-response	Proxy	High	47.4	43.9 to 50.8	51.7	48.2 to 55.7
Proxy	Self-response	High	48.3	44.6 to 52.0	53.4	49.6 to 57.8
Proxy	Same proxy	Moderate	42.2	39.4 to 44.9	47.3	44.4 to 50.5
Proxy	Different proxy	High	43.1	36.9 to 49.3	50.2	43.9 to 58.4
Amount received from self-employment income in 1999						
Self-response	Self-response	High	58.9	53.6 to 64.2	67.8	62.4 to 74.6
Self-response	Proxy	High	38.9	30.2 to 47.6	59.1	48.3 to 74.6
Proxy	Self-response	High	53.1	44.3 to 61.9	69.2	59.8 to 82.6
Proxy	Same proxy	Moderate	2.1	1.6 to 2.5	34.7	27.4 to 44.0
Proxy	Different proxy	High	0.4	0.1 to 0.7	50.1	22.2 to 100.0
Amount received from interest, dividends, net rental income, royalty income, or income from estates and trusts in 1999						
Self-response	Self-response	High	66	63.1 to 68.9	71.7	68.8 to 75.1
Self-response	Proxy	High	48.7	41.4 to 55.9	60.2	52.5 to 70.4
Proxy	Self-response	High	40.6	32.2 to 49.0	52.8	43.8 to 65.6
Proxy	Same proxy	Moderate	5.4	4.6 to 6.1	42	36.4 to 48.5
Proxy	Different proxy	Moderate	1.5	0.9 to 2.1	41.7	28.0 to 62.3
Amount received from Social Security or Railroad Retirement income in 1999						
Self-response	Self-response	High	55.3	52.6 to 58.0	59.3	56.5 to 62.3
Self-response	Proxy	High	60.2	52.2 to 68.3	64.5	57.4 to 74.6
Proxy	Self-response	High	61.1	53.6 to 68.6	66.3	59.4 to 75.8
Proxy	Same proxy	High	57.1	51.4 to 62.9	61.4	55.9 to 68.3
Proxy	Different proxy		...	...	...	...
Amount received from Supplemental Security Income (SSI) in 1999						
Self-response	Self-response	High	50	40.1 to 59.9	62.4	52.5 to 77.2
Self-response	Proxy		...	...	...	...
Proxy	Self-response		...	...	...	...
Proxy	Same proxy		...	...	...	...
Proxy	Different proxy		...	...	...	...

... Not sufficient data to compute response error measures

Table 31. Aggregate response variance measures for income by respondent type - Con.

Census	CRS	Inconsistency level	Gross difference rate		Index of inconsistency	
			Estimate	90-percent confidence interval	Estimate	90-percent confidence interval
Amount received from public assistance or welfare payments in 1999						
Self-response	Self-response	High	49.1	38.6 to 59.5	57.4	47.7 to 72.2
Self-response	Proxy		...	...	...	...
Proxy	Self-response		...	...	...	...
Proxy	Same proxy		...	...	...	...
Proxy	Different proxy		...	...	...	...
Amount received from retirement, survivor, or disability pensions in 1999						
Self-response	Self-response	Moderate	35.1	31.3 to 38.9	40.1	36.2 to 44.8
Self-response	Proxy		...	...	...	...
Proxy	Self-response		...	...	...	...
Proxy	Same proxy	Moderate	33.7	24.5 to 42.9	39.7	31.1 to 52.8
Proxy	Different proxy		...	...	...	...
Amount received from other sources of income in 1999						
Self-response	Self-response	Moderate	42.3	35.7 to 48.9	46.3	40.1 to 54.5
Self-response	Proxy		...	...	...	...
Proxy	Self-response		...	...	...	...
Proxy	Same proxy		...	...	...	...
Proxy	Different proxy		...	...	...	...
Total income received in 1999						
Self-response	Self-response	High	48.7	47.4 to 50.1	54.8	53.3 to 56.3
Self-response	Proxy	High	51.5	48.4 to 54.7	58.5	55.1 to 62.2
Proxy	Self-response	High	47.6	44.5 to 50.7	56.9	53.4 to 60.8
Proxy	Same proxy	Moderate	15.6	14.6 to 16.7	39.6	37.1 to 42.2
Proxy	Different proxy	Moderate	7.5	6.3 to 8.7	42.7	36.1 to 50.5

... Not sufficient data to compute response error measures

4.2 Did the Hispanic-origin and race questions provide consistent data?

In this section, we discuss the summary measures of response variance and their implications for the Hispanic-origin and race questions. We asked no probing questions and analyzed the data only for response variance. We used unedited data from both the CRS and census unless stated otherwise. Response variance measures for the Hispanic-origin and race questions are presented at the national level in Appendix C. Summary measures for the population characteristics by subgroup are also given in these tables. Data comparison tables for each question are presented at the national level in Appendix E. All sample sizes and response variance measures for Hispanic origin and race presented in section 4.2, Appendix C, and Appendix E are weighted unless stated otherwise. The CRS and census item numbers from the respective questionnaires are listed in parentheses following the item name. To compare two subgroups we used z-tests with 90-percent confidence.

For the Hispanic-origin and race questions, we looked at the number of CRS respondents who answered only one, both, or neither of the questions in both the census and the CRS. These counts, which are unweighted, are contained in Table 32 below. Over 95 percent of the respondents answered both questions in the census and CRS.

Table 32. Persons reporting Hispanic origin and race

Category	Census			CRS		
	Number	Percent	90-percent confidence interval	Number	Percent	90-percent confidence interval
Answered Hispanic-origin question only	201	1.0	0.9 to 1.1	59	0.3	0.2 to 0.4
Answered Race question only	407	2.1	1.9 to 2.2	90	0.5	0.4 to 0.5
Answered both questions	18796	96.1	95.9 to 96.4	19386	99.1	99.0 to 99.2
Answered neither question	150	0.8	0.7 to 0.9	19	0.1	0.0 to 0.1
Total number	19554	100.0	100.0 to 100.0	19554	100.0	100.0 to 100.0

Of those who responded to the Hispanic-origin question only in the census, about 72 percent (66.9 to 77.3) of sample persons were reported as being of Hispanic origin. We found different results in the CRS. Of those who responded to the Hispanic-origin question only in the CRS, approximately 25 percent (16.1 to 34.7) of sample persons were reported as being of Hispanic origin.

Of those who responded only to the race question in the census, approximately 70 percent (65.8 to 73.3) of sample persons were reported as being White. Results were similar in the CRS. Of those who responded only to the race question in the CRS, approximately 66 percent (57.3 to 73.8) of sample persons were reported as White.

Hispanic origin (CRS 9, Census 5)

The Hispanic-origin question was asked of everyone in Census 2000. The following changes were made to this question since 1990:

- In 2000, a note was included preceding the Hispanic-origin question which stated “NOTE: Please answer BOTH questions 5 and 6.”
- The order of the race and Hispanic-origin questions was switched in 2000. The Hispanic-origin question directly preceded the race question. In 1990, the race question preceded the Hispanic-origin question, but not directly. Two other questions (age/year of birth and marital status) separated these questions in 1990.
- In 2000, the term “Latino” was added to the question wording and response options.
- In 2000, examples were not included for the “Yes, other Spanish/Hispanic/Latino” response option, whereas in 1990 six examples were provided.

The Hispanic-origin question provided no instruction to the respondent. This question did not ask respondents to choose one or more response categories, but if the respondent did report multiple categories then we captured all responses in both the census and reinterview. This question had two write-in lines for the “Yes, other Spanish/Hispanic/Latino” category. Some respondents and enumerators wrote more than two groups in the lines provided. In these cases, we took the first two Hispanic-origin groups provided in both the census and CRS.

We analyzed the Hispanic-origin question in two different ways. First, we treated each response category as a separate “Yes/No” question and we analyzed each category as whether it was marked or not. For example, we treated the “Yes, Cuban” category as the question “(Are

you/Is...) Cuban?”. If the “Yes, Cuban” category was marked on the questionnaire, then we treated that response as “Yes,” otherwise we treated the response as “No.” We used unedited data in this analysis. Table 33 contains aggregate response variance measures for each response category.

The categories “No, not Spanish/Hispanic/Latino” and “Yes, Mexican, Mexican Am., Chicano” displayed low levels of inconsistency. The categories “Yes, Puerto Rican,” “Yes, other Spanish/Hispanic/Latino,” and “Yes, Cuban” displayed moderate levels of inconsistency. The net difference rates were significantly different from zero for all categories except “Yes, other Spanish/Hispanic/Latino.” This suggests that the one or both of the model assumptions were not met.

Less than 3 percent (2.4 to 2.8) of respondents chose “Yes, Puerto Rican” and approximately 1.0 percent (0.9 to 1.1) of respondents chose “Yes, Cuban” in either the census or CRS indicating that these are rare categories.

Table 33. Aggregate response variance measures for Hispanic origin (unedited data)

Reinterview classification	Inconsistency level	Index of inconsistency	
		Estimate	90-percent confidence interval
No, not Spanish/Hispanic/Latino	Low	10.2	9.3 to 11.1
Yes, Mexican, Mexican Am., Chicano	Low	18.0	16.6 to 19.5
Yes, Puerto Rican	Moderate	22.7	19.4 to 26.6
Yes, Cuban	Moderate	41.7	34.6 to 50.3
Yes, other Spanish/Hispanic/Latino	Moderate	42.2	39.0 to 45.7

Second, we coded responses to the Hispanic-origin question including write-ins to the “Yes, other Spanish/Hispanic/Latino” category. In both the census and the reinterview, we performed minimal editing for this question prior to analysis, but we did no imputation. Then, we grouped responses to the Hispanic-origin question into the following eight categories:

- Non-Hispanic
- Mexican, Mexican Am., Chicano
- Puerto Rican
- Cuban
- Other Hispanic
- Multiple non-Hispanic
- Multiple Hispanic
- Mixed non-Hispanic and Hispanic

The edited data exhibited low levels of inconsistency. The aggregate index of inconsistency was 17.2 (16.1 to 18.4). All categories were rare except “Non-Hispanic” and “Mexican, Mexican Am., Chicano.” About 3.3 percent of respondents changed answers when reinterviewed.

Of the respondents who changed answers when reinterviewed, about 20 percent (17.5 to 22.8) reported that the sample person was non-Hispanic in the census and a mix of non-Hispanic and Hispanic in the CRS. Table 34 below shows the origins that the respondent reported in the CRS.

These counts are weighted and rounded off to the nearest integer. The total count does not match the count found in Table E.8 in Appendix E for this reason. Approximately 53 percent (45.5 to 60.1) of these respondents chose both the “No, not Spanish/Hispanic/Latino” and “Yes, Mexican, Mexican Am., Chicano” categories during the CRS.

Table 34. Sample person reported as non-Hispanic in census and mixed non-Hispanic/Hispanic in CRS: Origins reported in CRS

Origins reported in CRS	Frequency
Non-Hispanic CB, Other Hispanic CB, Central American write-in	1
Non-Hispanic CB, Cuban CB	2
Non-Hispanic CB, Cuban CB, Other Hispanic CB	3
Non-Hispanic CB, Mexican CB	66
Non-Hispanic CB, Mexican CB, Cuban CB	3
Non-Hispanic CB, Mexican CB, Cuban CB, Other Hispanic CB	2
Non-Hispanic CB, Mexican CB, Puerto Rican CB	1
Non-Hispanic CB, Mexican CB, Puerto Rican CB, Cuban CB	1
Non-Hispanic CB, Mexican CB, Puerto Rican CB, Cuban CB, Other Hispanic CB	25
Non-Hispanic CB, Mexican CB, Puerto Rican CB, Other Hispanic CB	3
Non-Hispanic CB, Other Hispanic CB	10
Non-Hispanic CB, Other Hispanic CB, Spanish write-in	2
Non-Hispanic CB, Puerto Rican CB	1
Non-Hispanic CB, Puerto Rican CB, Cuban CB, Other Hispanic CB	2
Other Hispanic CB, Non-Hispanic write-in	2
Other Hispanic CB, Non-Hispanic write-in, Spanish write-in	1
Total	125

Non-Hispanic CB - “No, not Spanish/Hispanic/Latino” checkbox marked
 Mexican CB - “Yes, Mexican, Mexican Am., Chicano” checkbox marked
 Puerto Rican CB - “Yes, Puerto Rican” checkbox marked
 Cuban CB - “Yes, Cuban” checkbox marked
 Other Hispanic CB - “Yes, other Spanish/Hispanic/Latino” checkbox marked

Of the respondents that changed answers when reinterviewed, about 16 percent (13.8 to 18.6) reported that the sample person was other Hispanic in the census and Mexican, Mexican Am., or Chicano in the CRS. Table 35 below shows the origins that the respondent reported in the census. These counts are weighted and rounded off to the nearest integer. The total count does not match the count found in Table E.8 in Appendix E for this reason. Approximately 50.0 percent (41.9 to 58.1) of these respondents chose the “Yes, other Spanish/Hispanic/Latino” category and wrote-in Hispanic.

Table 35. Sample person reported as other Hispanic in the census and Mexican, Mexican Am., or Chicano in the CRS: Origins reported in census

Origins reported in census	Frequency
Central American write-in	3
Other Hispanic CB, Central American write-in	2
Other Hispanic CB, Dominican write-in	2
Hispanic write-in	1
Latin American write-in	3
Other Hispanic CB, Latin American write-in	2
Other Hispanic CB	26
Other Hispanic CB, Hispanic write-in	51
Other Hispanic CB, Spanish write-in	7
Other Hispanic CB, Spanish American write-in	1
Other Hispanic CB, Spanish American Indian write-in	2
Spaniard write-in	2
Total	102

Other Hispanic CB - "Yes, other Spanish/Hispanic/Latino" checkbox marked

The net difference rates for all categories except "Puerto Rican" and "Multiple non-Hispanic" were statistically different from zero suggesting that the CRS was not independent of the census and/or did not replicate the census conditions as well as desired. Response variance measures computed from edited Hispanic-origin data are contained in Table 36 below.

Table 36. Response variance measures for Hispanic origin (edited data)

Hispanic-origin categories	Inconsistency level	Index of inconsistency	
		Estimate	90-percent confidence interval
Non-Hispanic	Low	10.1	9.2 to 11.0
Mexican, Mexican Am., Chicano	Low	13.4	12.2 to 14.8
Puerto Rican	Low	14.2	11.5 to 17.6
Cuban	Low	13.7	9.3 to 20.1
Other Hispanic	Moderate	33.8	30.7 to 37.3
Multiple non-Hispanic	High	100.0	42.5 to 100.0
Multiple Hispanic	High	80.5	62.4 to 100.0
Mixed non-Hispanic and Hispanic	High	98.6	88.0 to 100.0
Aggregate	Low	17.2	16.1 to 18.4

Households with foreign-born sample persons showed less inconsistency (low) than households with native sample persons (moderate).

We analyzed the Hispanic-origin data by census collection type. Respondents who reported on mailback forms showed low inconsistency with an index of 17.6 (16.2 to 19.2). Respondents who reported to enumerators also showed low inconsistency with an index of 16.9 (15.2 to 18.8). These indexes were not significantly different at the 90-percent confidence level.

We evaluated single responses versus multiple responses. If the respondent reported that the sample person was non-Hispanic, Mexican, Puerto Rican, Cuban, or other Hispanic, then we considered this a single response. If the respondent reported that the sample person was of multiple non-Hispanic, multiple Hispanic, or mixed non-Hispanic and Hispanic origins, then we considered this a multiple response. These data showed high inconsistency. Reporting multiple responses was rare. Only 1.4 percent (1.3 to 1.6) of respondents reported multiple responses in either the census or CRS. The aggregate index of inconsistency was 93.6 (84.4 to 100.0). Approximately 1.3 percent (1.2 to 1.5) of respondents changed from a single response to multiple responses or vice versa when reinterviewed. Of those who changed their answers, about 77 percent (72.5 to 81.3) reported a single response in the census and multiple responses in the CRS and about 23 percent (18.7 to 27.5) reported multiple responses in the census and a single response in the CRS. The NDR was statistically different from zero suggesting that at least one of the model assumptions was not met.

Race (CRS 10, Census 6)

The race question is asked of all persons in the census. This question underwent some major modifications since 1990:

- A major change for the 2000 question was allowing the respondent to choose one or more races from the response categories. The 1990 question allowed respondents to choose only one race.
- For 2000, the American Indian and Alaska Native categories were combined. In 1990, these were three separate categories – American Indian, Eskimo, and Aleut. The 2000 version allowed American Indians and Alaska Natives to write-in their tribal affiliation. In 1990, there was a write-in only for American Indians.
- For 2000, the Asian and Pacific Islander response categories were split into two groups. Asian categories were listed in alphabetical order. Pacific Islander categories also were listed alphabetically, except that Native Hawaiian was the first category in the Pacific Islander list. The 1990 header for the Asian or Pacific Islander categories was deleted in 2000.
- For 2000, the term “Chamorro” was added to the 1990 response option “Guamanian,” i.e., “Guamanian or Chamorro.”
- For mailback forms, the race question in 2000 had six write-in lines – two for “American Indian or Alaska Native,” two for “Other Asian” or “Other Pacific Islander,” and two for “Some other race.” For enumerator forms (including the CRS), the race question had one write-in line for all four categories. In 1990, the race question had two write-in lines, one for “Indian (Amer.)” and one for “Other API” or “Other race.”

As mentioned above, the race question allowed respondents to choose one or more response categories. If the respondent reported multiple categories then we captured all responses in both the census and reinterview.

We analyzed the race question in two different ways. First, we treated each response category as a separate “Yes/No” question, analyzing each category as whether it was marked or not. For example, we treated the “White” category as the question “(Do you/does...) consider

(yourself/himself/herself) to be White?”. If the “White” category was marked on the questionnaire, then we treated that response as “Yes,” otherwise we treated the response as “No.” We used unedited data in this analysis. Table 37 contains aggregate response variance measures for each response category. All categories were rare except “White,” “Black, African Am., or Negro,” and “Some other race.” The net difference rates for eleven of the fifteen categories were statistically different from zero suggesting that the CRS was not independent and/or did not replicate the census conditions very well.

Table 37. Aggregate response variance measures for race (unedited data)

Reinterview classification	Inconsistency level	Index of inconsistency	
		Estimate	90-percent confidence interval
White	Low	19.1	18.2 to 20.1
Black, African Am., or Negro	Low	6.3	5.6 to 7.0
American Indian or Alaska Native	High	55.5	50.5 to 61.1
Asian Indian	Moderate	32.9	26.8 to 40.2
Chinese	Moderate	21.9	17.9 to 26.7
Filipino	Low	13.3	10.5 to 16.8
Japanese	Moderate	27.7	21.1 to 36.4
Korean	Low	16.8	12.0 to 23.5
Vietnamese	Moderate	25.7	19.3 to 34.1
Other Asian	Moderate	47.5	40.3 to 55.9
Native Hawaiian	High	50.7	37.8 to 68.1
Guamanian/Chamorro	High	100.0	72.9 to 100.0
Samoa	High	95.3	71.0 to 100.0
Other Pacific Islander	High	74.8	59.7 to 93.8
Some other race	High	74.9	70.9 to 79.1

Second, we coded responses to the race question, including write-ins. In both the census and the reinterview, we performed minimal editing for this question prior to analysis, but we did no imputation. We grouped responses to this question into the following seven categories:

- White
- Black, African Am., or Negro
- American Indian or Alaska Native
- Asian
- Native Hawaiian or Pacific Islander
- Some other race
- Two or more races

The edited data displayed moderate levels of inconsistency. The aggregate index was 23.1 (22.2 to 24.2) and 7.6 percent (7.3 to 7.9) of respondents changed answers between the census and the CRS. The “American Indian or Alaska Native,” “Native Hawaiian or Pacific Islander,” and “Two or more races” categories were rare. The net difference rates for the “White,” “Some other race,” and “Two or more races” categories were statistically different from zero. This shows that the reinterview did not meet at least one of the model assumptions (independence and replication). Table 38 provides response variance measures for each category computed from edited race data.

Of the respondents that changed answers between the census and CRS, about 14 percent (12.6 to 15.6) reported the sample person as “White” in the census and “Some other race” in the CRS, while about 32 percent (30.3 to 34.4) reported the sample person as “Some other race” in the census and “White” in the CRS. The “Some other race” category was collected as a write-in entry in both the census and the CRS. Analysis of these write-in entries indicated that the majority of persons in these two inconsistent categories were of Hispanic origin.

Table 38. Response variance measures for race (edited data)

Race categories	Inconsistency level	Index of inconsistency	
		Estimate	90-percent confidence interval
White	Moderate	20.3	19.4 to 21.3
Black, African Am., or Negro	Low	4.8	4.2 to 5.5
American Indian or Alaska Native	Moderate	38.3	32.1 to 45.6
Asian	Low	7.2	6.0 to 8.7
Native Hawaiian or Pacific Islander	Moderate	43.4	30.4 to 61.8
Some other race	High	67.6	63.7 to 71.8
Two or more races	High	74.1	69.3 to 79.1
Aggregate	Moderate	23.1	22.2 to 24.2

Table 39 provides summary measures by citizenship status. Households with native sample persons showed less inconsistency than households with foreign-born sample persons, although both were moderate.

Table 39. Aggregate response variance measures for race (edited data) by citizenship status

Native			Foreign born		
Index of inconsistency			Index of inconsistency		
Inconsistency level	Estimate	90-percent confidence interval	Inconsistency level	Estimate	90-percent confidence interval
Moderate	21.1	20.0 to 22.2	Moderate	38.6	35.9 to 41.4

Table 40 provides summary measures by census collection type. Respondents who reported on mailback forms showed less inconsistency than respondents who reported to enumerators, although both were moderate.

Table 40. Aggregate response variance measures for race (edited data) by collection type

Mailback			Enumerator		
Index of inconsistency			Index of inconsistency		
Inconsistency level	Estimate	90-percent confidence interval	Inconsistency level	Estimate	90-percent confidence interval
Moderate	20.9	19.7 to 22.2	Moderate	27.7	26.1 to 29.5

Approximately 71.0 percent (68.8 to 73.2) of the sample persons reported as “Some other race” in either the census or CRS were also reported to be of Hispanic origin in the corresponding interview. It was apparent that many Hispanics do not relate to the categories in the race question.

The edited data for race were analyzed by Hispanic origin. Households with non-Hispanic sample persons showed less inconsistency (low) than households with Hispanic sample persons (high). For those sample persons reported as non-Hispanics in the census, respondents reported very consistently. For those sample persons reported as Hispanics, the data exhibited a high level of inconsistency. This suggests that the Hispanic population contributed greatly to the variability in the race data. Response variance measures for race by Hispanic origin are provided in Table 41 below.

Table 41. Response variance measures for race by Hispanic origin (edited data)

Race categories	Non-Hispanic			Hispanic		
	Inconsistency level	Index of inconsistency		Inconsistency level	Index of inconsistency	
		Estimate	90-percent confidence interval		Estimate	90-percent confidence interval
White	Low	9.1	8.4 to 9.8	High	88.6	84.8 to 92.8
Black, African Am., or Negro	Low	3.9	3.3 to 4.5	Moderate	47.8	36.6 to 62.4
Am. Indian or Alaska Native	Moderate	32.1	26.1 to 39.5	High	72.0	50.5 to 100.0
Asian	Low	7.1	5.9 to 8.6	Moderate	30.5	11.7 to 79.8
Native Hawaiian or Pacific Islander	Moderate	38.5	26.0 to 57.0	High	100.0	44.4 to 100.0
Some other race	High	90.5	74.5 to 100.0	High	90.5	86.2 to 95.2
Two or more races	High	72.9	67.5 to 78.7	High	85.5	74.5 to 98.2
Aggregate	Low	12.6	11.8 to 13.5	High	86.9	83.4 to 90.6

We evaluated single responses versus multiple responses. If a single race was reported, then we considered this a single response. If two or more races were reported, then we considered this a multiple response. These data showed high inconsistency. Reporting multiple responses was rare. Only 4.5 percent (4.2 to 4.7) of respondents reported multiple responses in either the census or CRS. The aggregate index of inconsistency was 74.1 (69.3 to 79.1). Approximately 3.2 percent (3.0 to 3.4) of respondents changed from a single response to multiple responses or vice versa when reinterviewed. Of those that changed their answers, about 54 percent (50.8 to 57.4) reported a single response in the census and multiple responses in the CRS and about 46 percent (42.6 to 49.2) reported multiple responses in the census and a single response in the CRS. The NDR was statistically different from zero suggesting that at least one of the model assumptions was not met.

4.3 How consistent were census long-form data for housing characteristics?

The Content Reinterview Study measured response variance on the following housing characteristics:

- Number of people living in household on April 1, 2000
- Tenure (household owned or rented)
- Building:
 - building description
 - year structure built
 - year moved into structure
 - number of rooms
 - number of bedrooms
- Plumbing facilities
- Kitchen facilities

- Telephone service
- Heating fuel
- Number of autos, trucks, and vans
- Property usage:
 - business on premises
 - number of acres
 - agricultural sales
- Utility costs:
 - electricity
 - gas
 - water and sewer
 - oil, coal, kerosene, wood, etc.
- Rent
- Meals included in rent
- Mortgage:
 - type of first mortgage
 - mortgage payment
- Second mortgage:
 - second mortgage or home equity loan
 - second mortgage payment
- Real estate taxes:
 - real estate taxes included in mortgage
 - real estate tax payment
- Fire, hazard, and flood insurance:
 - insurance included in mortgage
 - insurance payment
- Value of property
- Condominium unit
- Mobile home:
 - mobile home loan
 - mobile home loan payment

Response variance measures for the housing-characteristic questions are presented at the national level in Appendix D. Measures for the housing characteristics by subgroup are also given in these tables. Table 42 shows the subgroups and which census or reinterview questions were used to determine these subgroups. Data comparison tables for each question are presented at the national level in Appendix F.

Table 42. Questions used to determine housing subgroups

Subgroup	Question
Race <ul style="list-style-type: none"> • White • Black • Asian • Other single race (American Indian or Alaska Native, Pacific Islander, or other race) • Two or more races 	Race (edited census, question 6)
Hispanic origin <ul style="list-style-type: none"> • Hispanic • Non-Hispanic 	Hispanic origin (edited census, question 5)

Table 42. Questions used to determine housing subgroups - Con.

Subgroup	Question
Homeowner status	Tenure (unedited census, question 33)
• Owner	• Owned with mortgage or loan, owned free and clear
• Renter	• Rented for cash rent
Census collection type	Census collection type (unedited census)
• Mailback	• D-1 (Short form), D-2 (Long form), D-1(UL) (Short form, update-leave), D-2(UL) (Long form, update-leave), D-10 (Be Counted)
• Enumerator	• D-1(E) (Short form), D-2(E) (Long form), D-2(E)(SUPP)
Respondent type	CRS question 50
• Same respondent as census	
• Different respondent than census	

4.3.1 Consistency of reports for the total U. S.

Table 43, below, gives the inconsistency level for the housing characteristics. Appendix D contains both the aggregate index of inconsistency for the housing-characteristic questions and also the index of inconsistency for each response category and subgroup.

Table 43. Inconsistency levels for housing characteristics

Housing characteristic	CRS question	Census question*	Inconsistency level
Number of people in household on April 1, 2000	4	S5	Low
Tenure (household owned or rented)	29	34	Low
Building:			
building description	30	35	Moderate
year structure built	31	36	Moderate
when moved into structure	32	37	Moderate
number of rooms	33	38	High
number of bedrooms	34	39	Moderate
Plumbing facilities	35	40	High
Kitchen facilities	36	41	High
Telephone service	37	42	High
Heating fuel	38	43	Low
Number of autos, trucks, and vans	39	44	Moderate
Property usage:			
business on premises	40a	45a	High
number of acres	40b	45b	Moderate
agricultural sales	40c	45c	High
Utility costs:			
electricity	41a	46a	High
gas	41b	46b	High
water and sewer	41c	46c	Moderate
oil, coal, kerosene, wood, etc.	41d	46d	Moderate
Rent	42a	47a	Moderate
Meals included in rent	42b	47b	Moderate

* The question numbers in this column refer to the enumerator long-form questionnaire (D-2E).

Table 43. Inconsistency levels for housing characteristics - Con.

Housing characteristic	CRS question	Census question*	Inconsistency level	
Mortgage:	type of first mortgage	43a	48	Low
	mortgage payment	43b	49	Moderate
Second mortgage or home equity loan:				
	type of loan	44a	52	Moderate
	loan payment	44b	53	High
Real estate taxes:	included in mortgage	43c	50	Low
	tax payment	45	54	Moderate
Fire, hazard, and flood insurance:				
	included in mortgage	43d	51	Moderate
	insurance payment	46	55	High
Value of property		47	56	High
Condominium unit		48b	57b	Moderate
Mobile home:	mobile home loan	49a	58a	High
	loan costs	49b	58b	High

* The question numbers in this column refer to the enumerator long-form questionnaire (D-2E).

As we see in Table 44, below, there were more items with a moderate or high level of inconsistency than with a low level of inconsistency.

Table 44. Summary of housing inconsistency

Low	Moderate	High
5	15	16

4.3.2 Consistency of reports by race of householder

Table H.1, in Appendix H, gives the inconsistency level for each housing question, based on the race of householder. We determined householder and the race of the householder from the census. We used the Hollander test for ordered alternatives to compare the overall inconsistency of housing items for the racial subgroup of the householder. From top to bottom, from least inconsistent to most inconsistent, we list the race of the householder for housing characteristics below ($z = 4.15$).

- White
- Two or more races
- Asian
- Other single race
- Black

Table 45, below, summarizes Table H.1.

Table 45. Summary of housing inconsistency by race of householder

Race	Inconsistency level			
	Low	Moderate	High	Unstable, undefined, or insufficient data to calculate
White	9	11	16	0
Black	0	13	20	3
Asian	4	11	13	8
Other single race	0	17	13	6
Two or more races	6	11	13	6

4.3.3 Consistency of reports by Hispanic origin of householder

Table H.2, in Appendix H, presents the inconsistency level for each question, for Hispanic and non-Hispanic householders. We determined the householder and Hispanic origin of the householder from the census. Table 46, below, summarizes the data in Table H.2.

Table 46. Summary of housing inconsistency by Hispanic origin of householder

Hispanic origin	Inconsistency level			
	Low	Moderate	High	Unstable, undefined, or insufficient data to calculate
Hispanic	1	14	16	5
Non-Hispanic	6	13	17	0

CRS units with non-Hispanic householders were more consistent than those with Hispanic householders when answering questions about number of people in household, building description, year structure built, year moved into structure, number of rooms, number of bedrooms, plumbing facilities, kitchen facilities, heating type (fuel), number of vehicles, business on premises, size of lot, agricultural sales, utility costs, rent, meals included with rent, mortgage (but not mortgage payment), real estate taxes included in mortgage payment, insurance included in mortgage payment, real estate tax payment, and insurance payment. The sample size was too small to calculate the index for units with Hispanic households for questions about second mortgage or home equity loan, second mortgage payment, condominium fees, mobile home loan, and mobile home payment. Units with Hispanic and non-Hispanic householders had the same inconsistency level for all other questions. To compare two subgroups we used z-tests with 90-percent confidence.

4.3.4 Consistency of reports by home-ownership status of householder

Table H.3, in Appendix H, presents the inconsistency level for each housing-characteristic question, for owners and renters. We determined the householder and home-ownership status from the census. Ownership could be either with a loan of some sort or free and clear. Renters included only those who pay cash rent. Table 47, below, summarizes the data in Table H.3.

Table 47. Summary of housing inconsistency by home-ownership status of householder

Owner/renter status	Inconsistency level			
	Low	Moderate	High	Unstable, undefined, or insufficient data to calculate
Owner	5	5	8	0
Renter (cash rent)	2	9	7	0

Owners were less inconsistent than renters when answering questions about the number of people in the household, tenure (own versus rent), building description, year structure built, year moved into the structure, heating type (fuel), size of lot, and agricultural sales. Renters were less inconsistent than owners when answering questions about the number of bedrooms, kitchen facilities, and utility costs (except for oil costs). Except for those questions that do not apply to both owners and renters (e.g., rent, mortgage costs), renters and owners had the same inconsistency levels for the remaining questions. To compare two subgroups we used z-tests with 90-percent confidence.

4.3.5 Consistency of reports for individual housing characteristics - detailed results

Unless otherwise indicated, the census and CRS housing questions did not explicitly refer to April 1, 2000. We asked no probing questions and analyzed the data only for response variance. We did not use edited data from either the CRS or the census. Unless otherwise indicated, these questions were only on the long form of Census 2000.

In the detailed analysis of each question, below, we reported the inconsistency level for each racial subgroup. For the other subgroup types we reported comparisons for one of these four types only if one subgroup within a type showed significantly less inconsistency than the other subgroup within that type (e.g., Hispanic versus non-Hispanic, owner versus renter, mailback versus enumerator, same respondent versus different respondent). Otherwise we did not report the inconsistency levels in this section. To compare two subgroups we used z-tests with 90-percent confidence.

Number of people in household, as reported by respondent (CRS 4, Census S5)

This question was on both the long form and the short form of Census 2000. It displayed low response variance.

At the beginning of the interview, the census and the CRS asked the number of people living or staying at the residence on April 1, 2000. The respondent was to include

- foster children, roomers, or housemates;
- people staying there on April 1, 2000, with no other permanent place to stay; and
- people living there most of the time while working, even if they had another place to live.

The respondent was to exclude

- college students living away while attending college;

- people in a correctional facility, nursing home, or mental hospital on April 1, 2000;
- Armed Forces personnel living somewhere else; and
- people who live or stay at another place most of the time.

We collected data as positive integers up to 99. These data were then put into seven categories, the last being “7 or more people”.

The aggregate index of inconsistency was 12.0 (11.6 to 12.5). Approximately 9.3 percent (9.0 to 9.7) of the CRS respondents switched answers when reinterviewed. Of the respondents with changed answers, 76.4 percent (75.9 to 76.9) changed by one person. Given that the respondents might have been actually answering for their current rather than past status, these “plus-or-minus one person” estimates amounts were not unexpected.

Responses for “1 person,” “2 people,” and “5 people” had net difference rates significantly different from zero. This shows that there may have been some problem with the independence or replication (probably of mode) of this question.

The index of inconsistency was low for each of the categories from “1 person” through “5 people.” The index was moderate for “6 people” and for “7 or more people.” There were more problems with these higher-level households in the original census collection due to problems with census continuation forms. Overall, differences in distributions were less than 0.4 percentage points for each category, which is quite acceptable.

Among the racial subgroups the inconsistency level ranged from low (white householder, Asian householder, householder in the two-or-more-races subgroup) through moderate (black householder, householder in the other-single-race subgroup). Households with non-Hispanic householders showed less inconsistency (low) than households with Hispanic householders (moderate). Households with owners showed less inconsistency than households with renters, although both were low. Among the collection-mode subgroups, households that received mailback census forms showed less inconsistency than households with enumerator-forms, although both were low. Not surprisingly, households with the same respondent for both CRS and Census 2000 showed less inconsistency than households with different respondents, although both were low.

Tenure (CRS 29, Census 34)

This question was on both the long form and the short form of Census 2000. It is basic to housing unit tabulations and analyses. We asked all respondents whether they owned or rented their residence. We could expect some inconsistency due to the time lag between the CRS and Census 2000 (up to nine months). The question itself was unchanged from 1990, but its placement changed. In 2000 the tenure question preceded the building-description question. As seen in Table 48, below, the inconsistency of this question increased in 2000. This question had significantly higher inconsistency in 2000 than in 1990 ($z = 10.9$), but the inconsistency level for both decades was low.

Table 48. Aggregate response variance measures for tenure by decade

2000			1990		
Index of inconsistency			Index of inconsistency		
Inconsistency level	Estimate	90-percent confidence interval	Inconsistency level	Estimate	90-percent confidence interval
Low	19.4	18.8 to 20.0	Low	13.3	12.6 to 14.0

This question displayed low inconsistency in 2000. The aggregate index was 19.4 (18.8 to 20.0). Approximately 12.3 percent (11.9 to 12.7) changed their responses between the census and the CRS.

The net difference rates for individual categories were all significantly different from zero. This shows that some model assumption, independence or replication, failed for the index of inconsistency.

The category “rented for cash rent” had a low index. The other categories had moderate indexes. The category with the highest index, 43.4 (39.7 to 47.5), was “occupied without payment of cash rent.” Of the 2.3 percent (1.2 to 3.5) of households reporting “occupied without payment of cash rent” on the census, 45 percent (41.0 to 49.0) changed to another category on the CRS. Of the 2.1 percent (0.9 to 3.3) of households that reported “occupied without payment of cash rent” on the CRS, 39.7 percent (35.6 to 43.8) reported another category on the census.

Among the racial subgroups, inconsistency levels ranged from low (white householder, Asian householder, householder in the two-or-more-races subgroup) through moderate (black householder, householder in the other-single-race subgroup). Households with owners showed less inconsistency (moderate) than households with renters (high). Not surprisingly, households that had the same respondent on both CRS and census showed less inconsistency (low) than households with different respondents on the two surveys (moderate).

Because renters showed more inconsistency than owners, we looked at two new subgroups:

- those who replied that they owned (either free and clear or with a mortgage) on both CRS and Census 2000, and
- those who responded that they rent (for cash rent or without cash rent) on both CRS and Census 2000.

Table 49. Aggregate response variance measures for tenure, within ownership categories

Inconsistency level	Owners on both CRS and Census 2000				Renters on both CRS and Census 2000				
	Gross difference rate		Index of inconsistency		Gross difference rate			Index of inconsistency	
	Estimate	90-percent confidence interval	Estimate	90-percent confidence interval	Inconsistency level	Estimate	90-percent confidence interval	Estimate	90-percent confidence interval
Moderate	12.2	11.8 to 12.7	28.0	26.9 to 29.1	Moderate	2.9	2.5 to 3.3	23.6	20.5 to 27.2

There was moderate inconsistency both within the owner status and within the renter status. If we collapsed the four response categories to “owned” and “rented,” the index of inconsistency

would have reduced to 7.1 (6.6 to 7.7) and the gross difference rate would have reduced to 2.8 (2.6 to 3.0).

Building (CRS 30, 31, 32, 33, 34, Census 35, 36, 37, 38, 39)

We asked all CRS respondents these questions about the building.

- Building description (CRS 30, Census 35)

The item on building description asked about the type of building and number of units (apartments) in a structure. This question was on both the long and short forms in 1990, but was only on the long form in 2000. From 1990 to 2000 this question changed two categories. In 1990, the first and last categories were “A mobile home or trailer” and “Other.” In 2000, these were “A mobile home” and “Boat, RV, van, etc.” Although the inconsistency level for both 1990 and 2000 was moderate, the response was significantly less inconsistent in 2000 than in 1990 ($z = -1.4$).

Table 50. Aggregate response variance measures for in building description by decade

2000			1990		
Index of inconsistency			Index of inconsistency		
Inconsistency level	Estimate	90-percent confidence interval	Inconsistency level	Estimate	90-percent confidence interval
Moderate	20.8	20.0 to 21.5	Moderate	21.9	21.0 to 23.0

This question displayed moderate inconsistency. The aggregate index was 20.8 (20.0 to 21.5). Approximately 10.4 percent (10.0 to 10.8) of the respondents changed their responses.

The net difference rates (except for “2 apartments,” “3 or 4 apartments,” and “20 to 49 apartments”) were all significantly different from zero. This shows that some model assumption, independence or replication, failed for the index of inconsistency. Indexes of inconsistency for the individual categories ranged from “low” through “moderate.”

The rare category “boat, RV, van, etc.” showed moderate inconsistency. The index was 50.0 (31.3 to 80.1). Less than 1 percent (0.03 to 0.10) of all households in the CRS said that they were in this category on either the CRS or the census. About 66.7 percent (48.4 to 84.9) of those in this rare category changed their responses. If this rare category were deleted, there would have been only minimal effect on the inconsistency of this question and the inconsistency level would be unchanged.

Among the racial subgroups, the inconsistency level ranged from low (white householder) through moderate (black householder, Asian householder, householder in the other-single-race subgroup, householder in the two-or-more-races subgroup). In the Hispanic-origin subgroups, households with non-Hispanic householders showed less inconsistency (low) than households with Hispanic householders (moderate). Households with owners

showed less inconsistency (low) than households with renters (moderate). Households receiving mailback census questionnaires showed less inconsistency (low) than households with census enumerator forms (moderate). Again, households with the same CRS respondent as census respondent (low) showed less consistency than households with different respondents (moderate).

Content reinterview surveys of past censuses showed that renters usually have greater difficulty answering this question than owners. As shown in Table 51, below, this tendency continued in 2000.

Table 51. Aggregate response variance measures for building description by home-ownership and decade

Owners				Renters		
Index of inconsistency				Index of inconsistency		
Decade	Inconsistency level	Estimate	90-percent confidence interval	Inconsistency level	Estimate	90-percent confidence interval
2000	Low	17.7	16.6 to 18.9	Moderate	30.4	29.1 to 31.7
1990	Low	18.4	17.0 to 20.0	Moderate	31.0	29.5 to 32.6

If we regrouped the data as the three categories,

- One-family home, attached or detached
- Apartments
- Mobile home, boat, RV, van, etc.,

then the overall inconsistency of this question would not increase significantly and the inconsistency for owners would not change significantly, but the inconsistency for renters would decrease significantly. We note that a greater percentage of renters lives in multi-unit structures than owners.

Table 52. Inconsistency of building description with three categories, for entire US, owners, and renters

CRS subgroups and categories	Inconsistency level	Sample size	Percent in CRS category	Net difference rate		Gross difference rate		Index of inconsistency	
				Estimate	90-percent confidence interval	Estimate	90-percent confidence interval	Estimate	90-percent confidence interval
Entire US									
One-family home, attached or detached	Low	-	74.1	-2.3	-2.7 to -1.8	7.3	6.9 to 7.7	18.5	17.4 to 19.6
Apartment	Moderate	-	18.2	3.5	3.1 to 3.9	7.4	7.0 to 7.9	23.2	21.9 to 24.6
Mobile home, boat, RV, van, etc.	Low	-	7.7	-1.3	-1.5 to -1.0	1.8	1.6 to 2.0	13.4	11.9 to 15.1
Aggregate									
Total units	Low	10667	-	-	-	8.2	7.8 to 8.7	19.5	18.4 to 20.6

Table 52. Inconsistency of building description with three categories, for entire US, owners, and renters - Con.

CRS subgroups and categories	Inconsistency level	Sample size	Percent in CRS category	Net difference rate		Gross difference rate		Index of inconsistency	
				Estimate	90-percent confidence interval	Estimate	90-percent confidence interval	Estimate	90-percent confidence interval
Owners									
One-family home, attached or detached	Low	-	87.8	0.4	0.1 to 0.6	3.8	3.6 to 4.1	18.2	16.9 to 19.6
Apartment	Moderate	-	4.9	-0.0	-0.3 to 0.2	3.5	3.2 to 3.8	38.0	35.2 to 41.1
Mobile home, boat, RV, van, etc.	Low	-	7.3	-0.3	-0.4 to -0.2	0.4	0.3 to 0.4	2.7	2.2 to 3.5
Aggregate									
Total units	Low	13255	-	-	-	3.8	3.6 to 4.1	17.7	16.4 to 19.0
Renters									
One-family home, attached or detached	Moderate	-	33.1	0.3	-0.6 to 1.1	11.4	10.5 to 12.2	25.6	23.9 to 27.5
Apartment	Moderate	-	63.2	-0.2	-1.0 to 0.7	11.3	10.5 to 12.1	24.3	22.7 to 26.0
Mobile home, boat, RV, van, etc.	Low	-	3.6	-0.1	-0.2 to 0.0	0.1	0.0 to 0.2	1.6	0.8 to 3.4
Aggregate									
Total units	Moderate	4432	-	-	-	11.4	10.6 to 12.2	23.3	21.8 to 25.0

- Year structure built (CRS 31, Census 36)

In 1990 the census allowed a response of “Don't know,” but that response was not an option in 2000. By eliminating the “Don't know” responses in 2000 we changed from having uncertain data to having missing data. This question had significantly more inconsistency in 2000 than in 1990 with the “Don't know” responses excluded ($z = 2.4$).

Table 53. Aggregate response variance measures for year structure built by decade

Inconsistency level	2000			1990		
	Index of inconsistency			Index of inconsistency		
	Estimate	90-percent confidence interval		Estimate	90-percent confidence interval	
Moderate	29.3	28.6 to 29.9	Including “Don't know”	Moderate	40.6	39.7 to 41.5
			Excluding “Don't know”	Moderate	27.6	26.7 to 28.6

This question showed moderate inconsistency in both decades. The aggregate index in 2000 was 29.3 (28.6 to 29.9). About 25.3 percent (24.7 to 25.9) of the households responding to this question changed their responses. Of the 25.3 percent of the households that changed their response, 73.4 percent (72.8 to 74.0) changed by one time period.

The index tended to increase for homes built earlier in time, except for the earliest time period (1939 or earlier). The index for the earliest time period was in the upper half of the low range.

The indexes for the individual categories ranged from “low” through “high.” The net difference rate was significantly different from zero for “1995-1998,” “1980-1989,” “1940-1949,” and “1939 or earlier.” That shows that some model assumption (independence or replication) failed.

Content reinterview surveys of past censuses showed that renters usually had greater difficulty answering this question than owners. As shown in Table 54, below, this tendency continued in 2000.

Table 54. Aggregate response variance measures for year structure built by home-ownership

Inconsistency level	Owners				Renters				
	Gross difference rate	90-percent confidence interval	Index of inconsistency	90-percent confidence interval	Inconsistency level	Gross difference rate	90-percent confidence interval	Index of inconsistency	90-percent confidence interval
Moderate	21.2	20.5 to 21.8	24.4	23.7 to 25.1	Moderate	41.8	40.2 to 43.4	48.9	47.1 to 50.8

Inconsistency levels for all subgroups were moderate. In the Hispanic-origin subgroups, households with non-Hispanic householders showed less inconsistency than households with Hispanic householders. Households with mailback forms showed less inconsistency than households with census enumerator forms. Not surprisingly, households with the same respondent on the CRS as on the census showed less inconsistency than households with different respondents.

- Year moved into structure (CRS 32, Census 37)

On the CRS we asked all respondents, “When did you move into this (house/apartment/mobile home)?” On the census we asked, “When did (person 1) move into this (house/apartment/mobile home)?” The census instruction was that “person 1” should be “the person who owns, is buying, or rents this (house/apartment/mobile home).” Whether the person who filled in the form actually followed this instruction is unknowable. On the CRS we did not ask that the respondent be “the person who owns, ...”

This item showed moderate inconsistency. The aggregate index was 21.2 (20.6 to 21.7). Approximately 17.2 percent (16.8 to 17.7) of households changed their response to this question. Of the 17.2 percent (16.8 to 17.7) who changed their responses, 76.8 percent (76.3 to 77.3) changed by one category.

The net difference rate was significantly different from zero for all categories except “1970 to 1979,” showing some model assumption failed. The index was low for “1999 or 2000,” “1970 to 1979,” and “1969 or earlier.” The index was moderate for “1995 to 1998,” “1990 to 1994,” and “1980 to 1989.”

Among the racial subgroups, the inconsistency levels ranged from low (white householder, Asian householder) through moderate (black householder, householder in the other-single-race subgroup, householder in the two-or-more-races subgroup). Households with non-Hispanic householders showed less inconsistency than households with Hispanic

householders, although both were moderate. Owners showed less inconsistency (low) than renters (moderate). Households with mailback forms showed less inconsistency (low) than households with census enumerator forms (moderate). Not surprisingly, households with the same respondent for CRS and census showed less inconsistency (low) than households with different respondents than on the census (moderate).

Content reinterview surveys of past censuses showed that renters usually had greater difficulty answering this question than owners. As shown in Table 55, below, this tendency continued in 2000.

Table 55. Aggregate response variance measures for year moved in by home-ownership

Inconsistency level	Owners				Renters				
	Gross difference rate		Index of inconsistency		Gross difference rate		Index of inconsistency		
	Estimate	90-percent confidence interval	Estimate	90-percent confidence interval	Inconsistency level	Estimate	90-percent confidence interval	Estimate	90-percent confidence interval
Low	15.9	15.3 to 16.4	19.3	18.7 to 20.0	Moderate	20.4	19.4 to 21.5	29.3	27.9 to 30.9

- Number of rooms (CRS 33, Census 38)

In 1990 the question about the number of rooms at the structure was on both the long form and the short form. In 2000 this question was only on the long form. This question showed high inconsistency.

We collected the data as a number from 1 to 99. Analysts converted it to nine categories, the last being “9 or more rooms.” Both the CRS and the census included the instruction “Do NOT count bathrooms, porches, balconies, foyers, halls, or half-rooms.”

The aggregate index of inconsistency was 57.1 (56.4 to 57.8). About 48.2 percent (47.6 to 48.9) of the respondents changed their responses for the CRS. Of the 48.2 percent of respondents who changed their responses, 68.3 percent (67.8 to 68.9) changed by one room.

The index was moderate for “4 rooms” and for “9 or more rooms.” It was high for all other response categories. The net difference rate was significantly different from zero for all categories except “7 rooms” and “9 or more rooms.” This shows that some model assumption for the index (independence or replication) failed for this question.

Aggregate inconsistency levels were high for all subgroups. Households with non-Hispanic householders showed less inconsistency than households with Hispanic householders. Households receiving census mailback forms showed less inconsistency than households with census enumerator forms. Again, households with the same respondent for both CRS and Census 2000 showed less inconsistency than households with different respondents.

- Number of bedrooms (CRS 34, Census 39)

We asked all households in the CRS the number of bedrooms at the residence. This item showed moderate inconsistency.

The index of inconsistency was 20.4 (19.8 to 21.1). About 14.3 percent (13.9 to 14.7) of respondents changed their response for the CRS. Of the 14.3 percent who changed their responses, 85.4 percent (85.0 to 85.9) changed by one category.

The net difference rate was significantly different from zero for all categories except “1 bedroom,” showing that some model assumption failed. The indexes for the individual categories ranged from low through moderate. There was a tendency for a larger number of rooms to have a higher index. The “none” category, showing moderate inconsistency, was an exception (having a higher index than any one of the other categories).

“None” was a rare category. About 1.1 percent (1.0 to 1.2) of the sample answered “none” on either the CRS or the census. The index for “none” was 43.7 (37.6 to 50.7), although only about 0.7 percent (0.6 to 0.8) of all respondents changed a response of “none.”

Among racial subgroups, inconsistency levels ranged from low (white householder, Asian householder, householder in the two-or-more-races subgroup) through moderate (black householder, householder in the other-single-race subgroup). Households with non-Hispanic householders showed less inconsistency than households with Hispanic householders, although both were moderate. Since rental units are often priced according the number of bedrooms, it was not surprising that households with renters showed less inconsistency (low) than households with owners (moderate). Households receiving census mailback forms showed less inconsistency (low) than households with enumerator forms (moderate). Not surprisingly, households with the same respondent for both CRS and census showed less inconsistency (low) than households with different respondents (moderate).

Plumbing (CRS 35) Census 40)

We asked each household if they had complete plumbing facilities. A household had complete plumbing facilities if it had:

- hot and cold piped water,
- a flush toilet, and
- a bathtub or shower.

In 2000 both the census and the CRS asked

Do you have COMPLETE plumbing facilities in this (house/apartment/mobile home); that is, 1) hot and cold piped water, 2) a flush toilet, and 3) a bathtub or shower?

- Yes, have all three facilities
- No

In 1990 the census question asked

Do you have COMPLETE plumbing facilities in this house or apartment; that is, 1) hot and cold piped water, 2) a flush toilet, and 3) a bathtub or shower?

- Yes, have all three facilities
- No

In 1990 the CRS asked about plumbing facilities in three separate questions, inquiring about the three plumbing attributes separately:

Is there hot and cold piped water in this (house/apartment)?

- Yes, hot and cold piped water
- Only cold piped water
- No piped water

Is there a flush toilet in this (house/apartment)?

- Yes
- No

Is there a bathtub or shower in this (house/apartment)?

- Yes
- No

Table 56. Aggregate response variance measures for plumbing by decade

2000			1990		
Index of inconsistency			Index of inconsistency		
Inconsistency level	Estimate	90-percent confidence interval	Inconsistency level	Estimate	90-percent confidence interval
High	85.2	74.3 to 97.7	High	53.8	45.1 to 64.2

This question showed high inconsistency in both decades, partially due to the rareness of not having complete plumbing facilities. Although this question was significantly more inconsistency in 2000 than in 1990 ($z = 3.4$), that is partially because there was a significantly higher percentage of in-category respondents in 1990 than in 2000 ($z = 3.0$). About 0.9 percent (0.7 to 1.0) of respondents in 2000 said they did not have complete plumbing facilities in at least one of the two interviews (CRS, census). Of that 0.9 percent, 91.8 percent (88.2 to 95.4) changed their responses. In 1990 about 1.2 percent (1.1 to 1.4) of the respondents said they did not have complete plumbing facilities in at least one of the two interviews. Of that 1.2 percent in 1990, about 69.6 percent (62.8 to 76.4) changed their responses in the reinterview.

The aggregate index in 2000 was 85.2 (74.3 to 97.7), but the gross difference rate was less than 1.0 (0.7 to 0.9). That means that less than 1 percent of respondents changed their response to this question. Of those who changed their response, about 51.0 percent (33.8 to 58.2) changed from “yes” on the census to “no” on the CRS and about 49.0 percent (31.8 to 66.2) changed from “no” on the census to “yes” on the CRS.

The net difference rate for each category was NOT significantly different from zero (-0.1 to 0.1).

All subgroups showed high inconsistency. Households with non-Hispanic householders showed less inconsistency than households with Hispanic householders.

Kitchen facilities (CRS 36, Census 41)

We asked each household if they had complete kitchen facilities. To have complete kitchen facilities, a kitchen must have included:

- a sink with piped water,
- a range or stove, and
- a refrigerator.

The question had the same form as in 1990.

The index of inconsistency for this question was high, partially due to the rareness of not having complete kitchen facilities. Roughly 0.8 percent (0.7 to 0.9) of the households responding to this question reported no kitchen facilities in at least one interview. Of this 0.8 percent, 86 percent (81.3 to 90.7) changed their response.

The aggregate index for this question was 75.8 (65.6 to 87.6). About 0.7 percent (0.6 to 0.8) of respondents changed their responses for the CRS. Of those who changed their response, about 54.3 percent (36.8 to 71.7) changed from “yes” on the census to “no” on the CRS and about 45.7 percent (28.3 to 73.2) changed from “no” on the census to “yes” on the CRS.

Net difference rates were not significantly different from zero.

All other subgroups showed high inconsistency. Households with non-Hispanic householders showed less inconsistency than households with Hispanic householders. Households with renters showed less inconsistency than households with owners.

Telephone service (CRS 37, Census 42)

On the 1990 census, we asked each household if there was a telephone in the unit. In 2000 we asked if there was telephone service available in the unit, from which they could both make and receive calls.

This question showed high inconsistency. The aggregate index was 54.7 (49.9 to 59.9), partially due to the rareness of not having telephone service. Because so few respondents reported not having a telephone, either on the CRS or the census or both, a few changing their response had a large impact on the index. Those who responded that they did not have telephone service might change their status from month to month. Their change in status might, depend on a precarious financial situation.

About 2.6 percent (2.4 to 2.8) of the respondents said that they had no telephone service on either the CRS or the census. Of this 2.6 percent, 70.0 percent (66.5 to 73.5) changed their response.

Approximately 1.8 percent (1.6 to 2.0) of all respondents changed their response between the census and the CRS. Of the 1.8 percent who changed their response, 57.7 percent (34.1 to 81.3) changed from “yes” on the census to “no” on the CRS and 42.3 percent (18.7 to 65.9) changed from “no” on the census to “yes” on the CRS.

The net difference rate was significantly different from zero for both categories, indicating that some model assumption for the index (independence or replication) failed.

Among racial subgroups the inconsistency level ranged from moderate (white householder, householder in the other-single-race subgroup) through high (black householder, Asian householder, householder in the two-or-more-races subgroup).

When we compared those who responded to the CRS by phone to those who responded to the CRS by personal visit, we saw that those who responded by personal visit showed less inconsistency than those who responded by phone ($z = 3.5$). Timing might be responsible for some of the inconsistency. However, it is possible that the respondents didn’t understand the question.

Table 57. Cross-tabulation for telephone service: CRS phone interview versus CRS personal visit interview

Reinterview classification	Census classification					
	CRS by phone			CRS by personal visit		
	Reported	1	2	Reported	1	2
Reported	14353	14269	84	3748	3556	192
Item response:						
1. Yes	14275	14211	64	3499	3426	73
2. No	78	58	20	249	130	119

Table 58. Aggregate response variance measures for telephone service: CRS phone interview versus CRS personal visit interview

Inconsistency level	CRS by phone				CRS by personal visit				
	Gross difference rate		Index of inconsistency		Gross difference rate		Index of inconsistency		
	Estimate	90-percent confidence interval	Estimate	90-percent confidence interval	Inconsistency level	Estimate	90-percent confidence interval	Estimate	90-percent confidence interval
High	0.8	0.7 to 1.0	75.7	65.3 to 87.8	Moderate	5.4	4.8 to 6.0	48.9	43.7 to 54.7

Heating fuel (CRS 38, Census 43)

We asked all respondents the type of heating fuel. This question showed low inconsistency. The aggregate index was 17.7 (17.1 to 18.3). Approximately 11.4 percent (11.0 to 11.8) of respondents changed their response.

The net difference rate was significantly different from zero for “gas: from underground pipes,” “gas: bottled, tank, or LP,” “solar energy,” and “no fuel used,” suggesting that some model assumption failed.

Indexes for individual categories were in the ranges:

Low	Moderate	High
gas: from underground pipes	coal or coke	solar energy
gas: bottled, tank, or LP	wood	no fuel used
electricity		other fuel
fuel oil, kerosene, etc.		

Among racial subgroups, inconsistency levels range from low (white householder) through moderate (black householder, Asian householder, householder in the other-single-race subgroup, householder in the two-or-more-races subgroup). Households with non-Hispanic householders showed less inconsistency (low) than households with Hispanic householders (moderate). Households with owners showed less inconsistency (low) than households with renters (moderate). Households that received census mailback forms showed less inconsistency (low) than households receiving census enumerator forms (moderate). Not surprisingly, households with the same respondent on the CRS and census showed less inconsistency (low) than households with different respondents (moderate).

Number of autos (CRS 39, Census 44)

We asked the number of automobiles, vans, and trucks of up to one-ton capacity. In both 1990 and 2000 this question showed moderate inconsistency, although the data were significantly more inconsistent in 2000 than in 1990 ($z = 6.6$).

Table 59. Aggregate response variance measures for number of autos by decade

2000			1990		
Index of inconsistency			Index of inconsistency		
Inconsistency level	Estimate	90-percent confidence interval	Inconsistency level	Estimate	90-percent confidence interval
Moderate	37.1	36.4 to 37.9	Moderate	32.1	31.1 to 33.1

In 1990 we collected this information as eight categories, ranging from “none” to “7 or more.” In 2000 we collected these data as numbers from 00 to 99, but then put the data into the seven categories, ranging from “no vehicles,” to “6 or more vehicles.”

This question showed moderate inconsistency. The aggregate index was 37.1 (36.4 to 37.9). Approximately 26.5 percent (25.9 to 27.0) of respondents changed their response. Of the 26.5 percent who changed their responses, 77.0 percent (76.5 to 77.5) changed by one category.

The net difference rate was significantly different from zero for all categories except “4 vehicles.” This shows that some model assumption for the index (independence or replication) failed.

The individual indexes are moderate for the individual categories for less than four vehicles and high for the individual categories for four or more vehicles. There was a slight tendency for a higher index for a greater number of vehicles.

All subgroups showed moderate inconsistency. Among the Hispanic-origin subgroups, households with non-Hispanic householders showed less inconsistency than households with Hispanic householders. Households receiving census mailback forms showed less inconsistency than households receiving census enumerator forms. Not surprisingly, households with the same respondent on both CRS and census showed less inconsistency than households with a different respondent.

Property usage (CRS 40, Census 45)

The instructions were to answer these three questions only if the residence was a one-family house or mobile home, so we only analyzed data from those residences. The questions on size of lot and agricultural sales were used to classify farm residences.

In 1990, the questions about having a business on the premises and about the size of the lot were on the short form, as well as on the long form. In 2000 these questions were only on the long form.

- Business on premises (CRS 40a, Census 45a)

We asked if there was a business on the property. The census and CRS forms did not explain what was meant by “business on the property.” A home office should not have been classified as a “business,” so that may have caused problems.

This question showed high inconsistency. The aggregate index was 65.8 (61.6 to 70.2). This is partially due to the rareness of having a business on the premises. About 4.5 percent (4.3 to 4.8) of the respondents changed their responses.

The net difference rates for the individual categories were not significantly different from zero (-0.3 to 0.3).

All subgroups showed high inconsistency. Households with non-Hispanic householders showed less inconsistency than households with Hispanic householders. Households receiving census mailback forms showed less inconsistency than households with census enumerator forms. Not surprisingly, households with the same respondent on both CRS and census showed less inconsistency than households with a different respondent on the census.

- Size of Lot (CRS 40b, Census 45b)

In 1990, the question about the size of the lot was asked in two different ways, depending on whether one had the short form or the long form. On the short form the question was “Is this house on ten or more acres?” On the long form a second question asked “Is this

house on less than 1 acre?" In 2000, the question about size of lot asked a single question, with the three options:

- Less than 1 acre
- 1 to 9.9 acres
- 10 or more acres

This question showed moderate inconsistency in both decades, but it was significantly less inconsistent in 2000 than in 1990 ($z = -6.3$). The aggregate index was 20.9 (20.0 to 22.0). Approximately 8.8 percent (8.4 to 9.2) of respondents changed their response. Of the 8.8 percent who changed their responses, 93.3 percent (93.0 to 93.7) changed by one category.

Net difference rates were significantly different from zero for "less than 1 acre" and "1 to 9.9 acres," showing that some model assumption failed. Inconsistency levels for the response categories were low ("less than 1 acre," "10 or more acres") and moderate ("1 to 9.9 acres").

Among racial subgroups, inconsistency levels ranged from low (white householder, householder in the two-or-more-races subgroup) through moderate (black householder, householder in the other-single-race subgroup). The index of inconsistency was unstable for households with an Asian householder. Households with non-Hispanic householders showed less inconsistency than households with Hispanic householders, although both were moderate. Households with owners showed less inconsistency (low) than households with renters (moderate). Households receiving census mailback forms showed less inconsistency (low) than households with census enumerator forms (moderate). Not surprisingly, households with the same respondent on both CRS and census showed less inconsistency (low) than households with different respondents (moderate).

- Agricultural sales (CRS 40c, Census 45c)

We asked the actual sales of agricultural products for the year 1999. In 1990 a similar question was asked, about sales in 1989. The index in 2000 showed significantly more inconsistency than in 1990 ($z = 2.1$). Unless the respondent checked records for both the CRS and the census, we expected some inconsistency.

This question showed high inconsistency in 2000. The aggregate index was 52.0 (47.1 to 57.4). About 7.6 percent (6.9 to 8.3) of respondents changed their response. Of the 7.6 percent who changed their responses to this question, 81.9 percent (78.1 to 85.7) reported "none" on either the CRS or the census. About 95.4 percent (94.9 to 96.0) of the units reported "none" and 4.6 percent (4.0 to 5.2) of the units reported "\$10,000" or more" on either the CRS or the census.

Only the categories "\$2,500 to \$4,999" and "\$5,000 to \$9,999" do not have net difference rates significantly different from zero. This shows that some model assumption for the index (independence or replication) failed. Individual categories had indexes of moderate ("None," "\$10,000 or more") and high (all other categories).

Every subgroup with enough data to reliably report the index showed high inconsistency. There were not enough data to reliably report the index of inconsistency for any racial subgroup other than “white” or “black.” Households with non-Hispanic householders showed less inconsistency than households with Hispanic householders. Households with owners showed less inconsistency than households with renters.

- Farm residence
Questions 40b and 40c were used together to classify a housing unit as a farm residence. A farm residence is a housing unit on one or more acres with agricultural sales of \$1,000 or more. Combining Q40b and Q40c we have the information given in Table 60.

Table 60. Cross-tabulation for farm residence in 2000 and 1990

Reinterview classification	Census classification					
	2000			1990		
	Reported	1	2	Reported	1	2
Reported	3624	3616	8	7576	7429	147
Item response:						
1. Nonfarm	3621	3613	8	7444	7390	54
2. Farm	3	3	0	132	39	93

Table 61. Response variance measures for farm residence by decade

Census decade and category	Inconsistency level	Sample size	Percent in CRS category	Net difference rate		Gross difference rate		Index of inconsistency	
				Estimate	90-percent confidence interval	Estimate	90-percent confidence interval	Estimate	90-percent confidence interval
2000									
Nonfarm	High	-	99.9	-0.1	-0.3 to 0.0	0.3	0.2 to 0.3	100.0	61.3 to 100.0
Farm	High	-	0.1	0.1	-0.0 to 0.3	0.3	0.2 to 0.3	100.0	61.3 to 100.0
Aggregate									
Total units	High	3624	-	-	-	0.3	0.2 to 0.3	100.0	61.3 to 100.0
1990									
Nonfarm	Moderate	-	98.3	-0.2	-0.4 to 0.0	1.2	0.8 to 1.7	34.0	28.6 to 40.3
Farm	Moderate	-	1.7	0.2	-0.0 to 0.4	1.2	0.8 to 1.7	34.0	28.6 to 40.3
Aggregate									
Total units	Moderate	7576	-	-	-	1.2	0.8 to 1.7	34.0	28.6 to 40.3

As Table 61 above shows, the index of inconsistency showed high inconsistency between the census and the CRS in 2000, but moderate inconsistency in 1990. This change in level of inconsistency is closely tied to the increase in rareness of being a farm residence. A few respondents changing into or out of a rare category have a disproportionate effect on the

index.

In 2000, about 0.3 percent (-8.8 to 9.4) of the households qualified to be farm residences on either the CRS or the census. All of those households in that rare category changed their classification between the CRS and Census 2000, having a drastic effect on the index of inconsistency. In 1990, 2.4 percent (-23.3 to 28.2) of the households qualified to be farm residences on either the CRS or the census. About 50 percent (44.0 to 56.0) of those qualified to be farm residences in 1990 changed their response between the 1990 CRS and the 1990 Census.

Utility Costs (CRS 41, Census 46)

We asked all households about annual utility costs on the CRS. All the utility-cost questions showed moderate or high inconsistencies. The aggregate index of inconsistency for each utility was either at the high end of the moderate range (water and sewer, oil) or in the high range (electricity, gas). Unless respondents actually consulted their bills to complete these questions, inconsistency between the census and the CRS was understandable. We had no way of knowing how often the enumerators had to calculate annual costs from weekly, monthly, quarterly, or semiannual costs.

In 2000 the word “annual” replaced the word “yearly” on the questions about utility costs on the census forms. Additionally, the cost of water specifically included sewage fees in 2000, but in 1990 it did not.

Roughly 30 to 40 percent of the households did not respond to both the CRS and the census for the utility-cost questions. Non-respondents and respondents may have different characteristics.

Table 62. Non-response rates for utility-cost questions

Utility	Percent not responding on the CRS or the census or both CRS and Census 2000
Electricity	29.9
Gas	37.3
Water and sewer	32.0
Oil	38.5

At a 90-percent confidence level, renters showed less inconsistency than owners for all utility costs except oil, as seen in Table 63 below.

Table 63. Aggregate response variance measures for utility costs by home-ownership status

Utility cost	Owners			Renters		
	Inconsistency level	Index of inconsistency		Inconsistency level	Index of inconsistency	
		Estimate	90-percent confidence interval		Estimate	90-percent confidence interval
Q41a Electricity	High	71.9	71.0 to 72.9	High	64.0	62.4 to 65.7
Q41b Gas	High	58.4	57.3 to 59.4	Moderate	48.4	46.4 to 50.5
Q41c Water and sewer	Moderate	49.4	48.3 to 50.4	Moderate	38.2	35.9 to 40.6
Q41d Oil, coal, kerosene, wood, etc.	Moderate	46.6	44.7 to 48.6	Moderate	46.0	40.2 to 52.7

- Electricity cost (CRS 41a, Census 46a)

We collected electricity costs as an amount from \$1 to \$9,999 or as a check box for “included in rent...” or “no charge...” Analysts then put the data into 11 categories.

This question showed high inconsistency. The aggregate index was 68.8 (68.0 to 69.6). About 58.9 percent (58.2 to 59.6) of respondents changed their response. Of the 58.9 percent who changed their response, 52.9 percent (52.2 to 53.6) changed their response by one category.

The net difference rate was significantly different from zero for seven of the 11 categories. This shows that some model assumption for the index of inconsistency (independence or replication) failed.

All categories, except “included in rent, other fee, no charge” (moderate), had high indexes.

All subgroups showed high inconsistency levels. Households with non-Hispanic householders showed less inconsistency than households with Hispanic householders. Households with renters showed less inconsistency than households with owners. Not surprisingly, households with the same respondent on CRS and Census 2000 showed less inconsistency than households with a different respondent on the census.

- Gas cost (CRS 41b, Census 46b)

We collected gas costs as an amount from \$1 to \$9,999, or as a check box for “included in rent...” or “no charge...” Analysts then put the data into 11 categories.

This question showed high inconsistency. The aggregate index was 54.9 (54.0 to 55.8). Approximately 43.4 percent (42.7 to 44.1) of respondents changed their response. Of the 43.4 percent who changed their response, 54.3 (53.5 to 55.0) changed their response by one category.

The net difference rate was significantly different from zero for all categories except “less than \$300,” “\$600 to \$899,” and “\$2,400 to \$3,599.” This shows that some model assumption for the index of inconsistency (independence or replication) failed. All

categories, except “included in rent, other fee, no charge” (low), had high indexes.

All subgroups, except renter (moderate) showed high inconsistency. Households with non-Hispanic householders showed less inconsistency than households with Hispanic householders. Renters showed less inconsistency (moderate) than owners (high). Households receiving census enumerator forms showed less inconsistency than households receiving census mailback forms. Not surprisingly, householders with the same respondent on the CRS and the census showed less inconsistency than households with different respondents.

- Water and sewer cost (CRS 41c, Census 46c)

We collected water and sewer costs as an amount from \$1 to \$9,999, or as a check box for “included in rent...” or “no charge...” Analysts then put the data into 10 categories.

This question showed moderate inconsistency. The aggregate index was 43.8 (43.0 to 44.8). Approximately 32.3 percent (31.6 to 33.0) of respondents changed their responses. Of the 32.3 percent who changed their responses, 58.5 percent (57.8 to 59.2) changed by one category.

The net difference rate was significantly different from zero for all categories except “\$600 to \$899,” “\$1,200 to \$1,499,” “\$1,500 to \$1,799.” This shows that some model assumption for the index of inconsistency (independence or replication) failed. All response categories, except “less than \$300” (moderate) and “included in rent, other fee, no charge” (low), had high indexes.

Among the racial subgroups, inconsistency levels ranged from moderate (white householder, Asian householder, householder in the two-or-more-races subgroup) through high (black householder, householder in the other-single-race subgroup). Households with non-Hispanic householders showed less inconsistency (moderate) than households with Hispanic householders (high). Households with renters showed less inconsistency than households with owners, although both were moderate. Not surprisingly, households with the same respondent for both CRS and census showed less inconsistency than households with different respondents, although both were moderate.

- Oil cost (CRS 41d, Census 46d)

We collected oil costs as an amount from \$1 to \$9,999, or as a check box for “included in rent...” or “no charge...” Analysts then put the data into 10 categories.

This question showed moderate inconsistency. The aggregate index was 46.0 (44.2 to 47.9). The aggregate gross difference rate was 12.3 (11.8 to 12.8). Of the 12.3 percent who changed their response, 60.1 percent (58.0 to 62.2) gave a higher cost on the CRS than on the census and 39.9 percent (37.8 to 42.0) gave a higher cost on the census than on the CRS.

The net difference rate was significantly different from zero for “less than \$300,” “\$300 to \$599,” “\$2,100 to \$2,399” and “included in rent, other fee, no charge.” This shows that some model assumption for the index of inconsistency (independence or replication) failed. All categories, except “included in rent, other fee, no charge” (moderate), had high indexes.

Among racial subgroups, inconsistency levels ranged from moderate (white householder) through high (black householder, Asian householder, householder in the other-single-race subgroup, householder in the two-or-more-races subgroup). Households with non-Hispanic householders showed less inconsistency (moderate) than households with Hispanic householders (high). Households that received census mailback forms showed less inconsistency (moderate) than households that received census enumerator forms (high). Not surprisingly, households with the same respondent on both CRS and census showed less inconsistency (moderate) than households with different respondents (high).

Rent (CRS 42a, Census 47a)

We asked renters their monthly rent. We analyzed the data only for those reporting “rented for cash rent” (CRS question 29, Census 33) on both the CRS and the census. We collected the data as amounts from \$1 to \$99,999, with a check box for “no cash rent.” Analysts then put the data into 23 categories. In 1990 the data were collected as 26 categories, with some probing to capture rent assistance. In 1990 this question was on the short form, as well as the long form. In 2000 this question was only on the long form.

This question showed moderate inconsistency. The aggregate index was 23.2 (22.1 to 24.4). In 1990 the aggregate index was 34.7 (33.1 to 36.4). Since the questionnaires had different numbers of categories for this question, their indexes of inconsistency are not truly comparable.

Approximately 21.9 percent (20.9 to 23.0) of respondents in 2000 changed their responses.

The net difference rate was significantly different from zero for “\$150 to \$199,” “\$250 to \$299,” “\$900 to \$999,” “\$2,000 or more,” and “no cash rent.” This shows that some model assumption for the index (independence or replication) failed. Indexes for the individual categories were low or moderate, except for “\$1,750 to \$1,999” (unstable) and “\$2,000 or more” (high).

Among the racial subgroups, inconsistency levels ranged from low (householder in the two-or-more-races subgroup) through moderate (white householder, black householder, Asian householder, householder in the other-single-race subgroup). Households with non-Hispanic householders showed less inconsistency than households with Hispanic householders, but only about a sixth as many Hispanics as non-Hispanics responded to this question. Both subgroups showed moderate inconsistency. Households receiving census mailback forms showed less inconsistency than households with census enumerator forms, but both were moderate. Not surprisingly, households with the same respondent on the CRS and the census showed less inconsistency than households different respondents, but both were moderate. Only about a fifth as many responded with a different respondent on the CRS than with the same respondent as on the census.

Table 64. Inconsistency of monthly rent by race

Race	White	Black	Asian	Other single race	Two or more races
Inconsistency level	Moderate	Moderate	Moderate	Moderate	Low
Index of inconsistency	20.7	32.9	27.2	25.9	19.2
90-percent confidence interval	(19.5 to 22.1)	(29.9 to 36.5)	(21.7 to 34.7)	(21.7 to 31.3)	(13.9 to 27.4)

Meals included with rent (CRS 42b, Census 47b)

We asked respondents who reported renting for cash rent if their monthly rent included meals. The same question appeared in 1990. In 1990 the analysts determined they did not have enough data to compute the index of inconsistency.

This question showed moderate inconsistency. The aggregate index was 38.2 (28.9 to 50.6). About 0.9 percent (0.6 to 1.1) of respondents changed their response. The net difference rate was NOT significantly different from zero for either category.

The large size of the index was due partially to the rareness of having meals included in the rent. Of the 1.6 percent (1.3 to 1.9) who reported that meals are included in the rent, on either the CRS or the census, about 54.8 percent (44.4 to 65.2) changed their responses. Of those who changed their response, about a third changed from no meals included on the census to meals included on the CRS, and about two thirds changed from meals included on the census to no meals included on the CRS.

Among racial subgroups, inconsistency levels ranged from moderate (white householder) through high (black householder, householder in the other-single-race subgroup, householder in the two-or-more-races subgroup). The index was unstable for households with Asian householders. Households with non-Hispanic householders showed less inconsistency (moderate) than households with Hispanic householders (high). Households receiving census mailback forms showed less inconsistency (moderate) than households with census enumerator forms (high).

Mortgage (CRS 43, Census 48, 49)

We asked the mortgage questions only for those who indicated that they owned or were buying the structure on the CRS.

- Mortgage, deed of trust, contract to purchase, or similar debt (CRS 43a, Census 48)

If the respondent indicated that someone in the household owned or was buying the residence, we asked if they had “a mortgage, deed of trust, contract to purchase, or similar debt” on the property. This question showed low inconsistency. The aggregate index was 17.2 (16.2 to 18.2).

About 7.8 percent (7.3 to 8.2) of respondents changed their response to this question. Of the 7.8 percent who changed their responses on this question, 81.6 percent (79.5 to 83.8) said “no” on either CRS or the census. Of those who said no and changed their response,

70.2 percent (67.3 to 73.0) said “no” on the CRS and 29.8 percent (27.0 to 32.7) said “no” on the census.

The highest index for an individual category was for “yes, contract to purchase” (high), which was a rare category. The other two categories showed low inconsistency.

If we collapsed the two “yes” categories, the aggregate index of inconsistency would be 14.5 (13.6 to 15.4) and the aggregate gross difference rate would be 6.3 (6.0 to 6.7). With this collapse, the index would be low for both the individual categories and the aggregate. Perhaps there was confusion between contract to purchase and other debts.

Among the racial subgroups, inconsistency levels ranged from low (white householder) through moderate (black householder, Asian householder, householder in the other-single-race subgroup, householder in the two-or-more-races subgroup). Households with non-Hispanic householders showed less inconsistency (low) than households with Hispanic householders (moderate). Households that received census mailback forms showed less inconsistency (low) than households that received census enumerator forms (moderate). Not surprisingly, households with the same respondent for both census and CRS showed less inconsistency (low) than households with different respondents (moderate).

- Amount of monthly mortgage payment (CRS 43b, Census 49)

The instructions on the CRS were to ask respondents this question about the monthly mortgage payment only if the household reported having a mortgage, deed of trust, contract to purchase, or similar debt on CRS question 44a. The CRS collected the data as an amount from \$0 to \$99,999, allowing a check box for “no regular payment required.” Analysts converted the data to 20 categories, ranging from “less than \$100” to “\$4,000 or more” and “no regular payment.”

We edited this question to collect data only from those who did not say they were renters on the census (category “3” or “4” on CRS question 29, census question 34). About 0.5 percent (0.3 to 0.7) of those respondents who said they rented on the census gave a mortgage amount (which we edited out for our analysis).

This question showed moderate inconsistency. The aggregate index was 27.6 (26.6 to 28.7). About 25.4 percent (24.4 to 26.3) of respondents changed their responses.

The net difference rate was significantly different from zero for only three categories: “\$1,000 to \$1,249,” “\$1,250 to \$1,499,” and “\$4,000 or more.” Some model assumption for the index (independence or replication) may have failed. The index was low for the response category “\$200 to \$299.” The index was high only for the rare categories “less than \$100,” “\$4,000 or more,” and “no regular payment required.” The indexes for the other response categories were moderate.

Among the racial subgroups, inconsistency levels ranged from low (householder in the two-or-more-races subgroup) through moderate (white householder, black householder, Asian householder, householder in the other-single-race subgroup). Not surprisingly,

households with the same respondent on the CRS and the census showed less inconsistency than households with different, but both were in the moderate range.

Second mortgage (CRS 44a, 44b, Census 52, 53)

We asked CRS questions about second mortgages only if the respondent indicated that someone in the household owned or was buying the structure.

- Second mortgage or home equity loan (CRS 44a, Census 52)

If the respondent indicated that someone in the household owned or was buying the residence, we asked if they had a second mortgage or a home equity loan on the property. This question was changed from 1990. In 1990 the question included the description “junior mortgage,” but that was not on the 2000 questionnaire. Additionally, the option “yes” from 1990 became the two options:

- “Yes, a second mortgage” and
- “Yes, a home equity loan.”

Since one can have both a second mortgage and a home equity loan, this was a “mark all that apply” question. This question was designed to capture information even from those households that felt that a home equity loan was not a second mortgage. For analysis we grouped categories in the following ways:

If the respondent answered ...	Then we assigned ...
“Yes” to both “second mortgage” and “home equity loan,”	“both second mortgage and home equity loan,” whether or not “no” was also marked
“Yes” to “second mortgage” but not to “home equity loan,”	“second mortgage only,” whether or not “no” was also marked
“Yes” to “home equity loan” but not to “second mortgage,”	“home equity loan only,” whether or not “no” was also marked
“No” (and no “yes” response also marked),	“No.”

Analyzed as above, this question showed moderate inconsistency. The aggregate index was 48.6 (46.7 to 50.6). Approximately 13.0 percent (12.5 to 13.6) of respondents changed their responses. If we combined all yes categories into one category, this question would have shown moderate inconsistency (index 38.9, confidence interval 37.1 to 40.8). This inconsistency suggests that people may have trouble determining the difference between a home equity loan and a second mortgage.

The net difference rate was significantly different from zero for all categories except for “both second mortgage and home equity loan.” This shows that some model assumption for the index of inconsistency (independence or inconsistency) failed. The rare category “both second mortgage and home equity loan” had an extremely high index of

inconsistency. Both “only” categories had high indexes; “no” had moderate index.

Respondents often have problems with “mark all that apply” questions. For this question that means that some might answer both “yes” and “no.” There were a very few respondents who marked both “yes” and “no” to this question, on either the CRS or the census.

Table 65. Cross-tabulation for second mortgage by type of response

Reinterview classification	Census classification		
	1	2	3
1. “Yes” only	1084	284	2
2. “No” only	772	8804	11
3. Both “Yes” and “No”	19	30	0

Table 66. Type of second mortgage response versus collection types on census and CRS

	Census		CRS	
	Enumerator	Mailback	Telephone	Personal visit
1. “Yes” only	235	1640	1179	189
2. “No” only	1662	7456	7801	1751
3. Both “Yes” and “No”	1	12	41	7

When we analyzed each response as a separate question (CRS question 44m, CRS question 44e, and CRS question 44n), they showed high levels of inconsistency. When we grouped the responses, the data showed slightly less inconsistency. (See Tables D.26, D.27, D.28, and D.29 in Appendix D.)

- Second mortgage payment (CRS 44b, Census 53)

When the property owner indicated a second mortgage or a home equity loan, we asked for the monthly amount. We collected the data as an amount from \$1 to \$99,999 and had a check box for “no regular payment.” Analysts converted the data to 20 categories, ranging from “less than \$100” to “\$4,000 or more” and “no regular payment.”

This question showed a high level of inconsistency. The aggregate index was 93.7 (92.1 to 95.5). About three-quarters of all respondents to this question reported being the respondent who supplied the housing responses on the census. The index of inconsistency for the subgroup “same respondent as on census” was high, at 94.2 (confidence interval of 92.5 to 96.3). All subgroups had similarly high indexes of inconsistency.

About 88.7 percent (87.1 to 90.3) of the respondents changed their response to this question. Of the 88.7 percent who changed their response, 87.9 percent (86.2 to 89.7) gave a higher amount on Census 2000 than on the CRS and 12.1 percent (10.3 to 13.8)

gave a higher amount on the CRS than on Census 2000.

Net difference rates were significantly different from zero for all categories except “\$400 to \$499,” “\$3,000 to \$3,499,” “\$4,000 or more,” and “no regular payment required.” This indicated that some model assumption for the index (independence or replication) failed.

All subgroups with enough data to calculate the index of inconsistency showed very high levels of inconsistency.

Real estate taxes (CRS 43c, 45, Census 50, 54)

We only asked about real estate taxes if the CRS respondent indicated that someone in the household owned or was buying the structure.

- Real estate taxes included in mortgage (CRS 43c, Census 50)

We asked all respondents that indicated a mortgage, deed of trust, contract to purchase, or similar debt on CRS question 44a if their mortgage payment included real estate taxes. We excluded from our analysis renters (as indicated on the CRS or on the census).

This question showed low inconsistency. The aggregate index was 18.6 (17.2 to 20.0). Approximately 8.7 percent (8.1 to 9.3) of respondents changed their response. Both “yes” and “no” had a net difference rate significantly different from zero.

Among the racial subgroups, inconsistency levels ranged from low (white householder) through moderate (black householder, Asian householder, householder in the other-single-race subgroup). Households with non-Hispanic householders showed less inconsistency (low) than households with Hispanic householders (moderate). Households that received census mailback forms showed less inconsistency (low) than households with enumerator-collected census data (moderate). Households with the same respondent on the CRS and the census showed less inconsistency (low) than households with a different respondent than on the census (moderate).

- Real estate tax payment (CRS 45, Census 54)

On the CRS we asked this question only if the respondent indicated that someone in the household owned or was buying the house, apartment, or mobile home. We asked the annual payment for real estate taxes on the property “last year.” We collected the data as an amount from \$1 to \$99,999 or as a check box for no taxes. Analysts converted the data to 15 categories, from “less than \$200” through “\$10,000 or more” and “no real estate taxes paid.”

This question showed moderate inconsistency. The aggregate index was 44.0 (43.0 to 45.0).

Approximately 39.8 percent (38.9 to 40.7) of respondents changed their responses. Of the 39.8 percent who changed their responses, 57.9 percent (56.9 to 58.8) changed by one

category.

The net difference rate was significantly different from zero for “less than \$200,” “\$1,500 to \$1,999,” “\$3,000 to \$3,999,” and “\$10,000 or more.” This indicated that some model assumption (independence or replication) failed. Individual indexes ranged from moderate through high.

All racial subgroups except black (high) showed moderate inconsistency. Households with non-Hispanic householders showed less inconsistency (moderate) than households with Hispanic householders (moderate). Not surprisingly, households with the same respondent on the CRS and the census showed less inconsistency than households with different respondents, although both were moderate.

Fire, hazard, and flood insurance

We asked about fire, hazard, and flood insurance only if the CRS respondent indicated that someone in the household owned or was buying the structure.

- Insurance included in mortgage (CRS 43d, Census 51)

We asked all respondents that indicated a mortgage, deed of trust, contract to purchase, or similar debt on CRS question 44a if their mortgage payment included “payments for fire, hazard, or flood insurance” on the property. We excluded from our analysis renters (as indicated on the CRS or on the census).

This question showed moderate inconsistency. The aggregate index was 26.6 (25.1 to 28.1). Approximately 13.1 percent (12.4 to 13.9) of respondents changed their response. Both “yes” and “no” had net difference rates significantly different from zero. This indicates some model assumption for the index (independence or replication) failed.

All subgroups except renters showed moderate inconsistency. This question was not analyzed for renters. Households with non-Hispanic householders showed less inconsistency than households with Hispanic householders. Households that received census mailback forms showed less inconsistency than households with enumerator forms. Not surprisingly, households with the same respondent on the CRS and the census showed less inconsistency than households with different respondents.

- Insurance payment (CRS 46, Census 55)

On the CRS we asked this question only if the respondent indicated that someone in the household owned or was buying the house, apartment, or mobile home. We asked the annual payment for fire, hazard, and flood insurance on the property for “last year.” We had no way of knowing how many enumerators had to convert to annual amounts from other time periods (weekly, quarterly, semiannually).

We recorded the data as values from \$1 to \$99,999, and allowed a check box for no payment. Analysts converted this information to 17 categories, from “less than \$100”

through “\$6,000 or more” and (the 17th category) “no insurance payment.”

This question showed high inconsistency. The aggregate index was 65.6 (64.5 to 66.7). Approximately 57.9 percent (56.9 to 58.9) of respondents changed their responses.

The net difference rate was significantly different from zero only for “200 to \$299,” “\$300 to \$399,” “\$400 to \$499,” “\$6,000 or more,” and “no insurance payment.” This showed that some model assumption for the index (independence or replication) failed. All individual indexes were high.

All subgroups except renters showed high inconsistency. This question was not analyzed for renters. Households with non-Hispanic householders showed less inconsistency than households with Hispanic householders. Not surprisingly, households with the same respondent for both the CRS and the census showed less inconsistency than households with different respondents.

Property value (CRS 47, Census 56)

On the CRS we asked this question only if the respondent indicated that someone in the household owned or was buying the house, apartment, or mobile home. We asked the value of the property. In 1990 this question was on both the census long form and the census short form. In 2000 it was only on the census long form. As the National Content Survey report on Value² indicated, property value varies widely from area to area (e.g., rural West Virginia to Marin County, California). It was necessary to have sufficient categories to capture details for this quantity. The number of categories for this question dropped from 26 in 1990 to 24 in 2000. Additionally, the highest interval in 1990 was “\$500,000 or more” but was “\$1,000,000 or more” in 2000.

This question showed high inconsistency. The aggregate index was 59.1(58.2 to 59.9). About 55.2 percent (54.4 to 56.0) of respondents changed their response. Of these 55.2 percent who changed their responses, 62.5 percent (61.5 to 63.6) gave a higher value on the CRS than on the census and 37.5 percent (36.4 to 38.5) gave a higher value of the census than on the CRS. In other words, most households changed their response from the census to the CRS. Of those who changed their response, most gave a higher value on the CRS. It was not surprising that of the 55.2 percent who changed their responses, 65.2 percent (64.4 to 65.9) changed by one category.

The net difference rate was significantly different from zero for half of the 24 categories. This showed that some model assumption for the index (independence or replication) failed. All individual indexes were high except for the four moderately inconsistent categories “less than \$10,000,” “\$300,000 to \$399,999,” “\$500,000 to \$749,999,” and “\$1,000,000 or more.”

All subgroups except renters showed high inconsistency. This question was not appropriate for renters.

²Wilson, Ellen (1997). “1996 National Content Survey: Value ,” Internal U.S. Census Bureau report, p4.

On the CRS, slightly more than one-fifth of the respondents to this question reported that a different household member gave the household information on the census. Slightly more than three-quarters of the respondents to this question reported that they gave the household information on the census. Not surprisingly, households with the same respondent on the CRS and the census showed less inconsistency than households with different respondents.

Condominium fee (CRS 48b, Census 57b)

We asked this question only if someone in the household owned or was buying the house, apartment, or mobile home. This question asked the monthly condominium fee, if the building was part of a condominium. On the CRS and the census enumerator questionnaires, enumerators preceded this question by asking “Is this (house/apartment/mobile home) part of a condominium?” The mailout/mailback questionnaire preceded this question with the instruction to answer this question “ONLY if this is a CONDOMINIUM.” We had no way of knowing how well the respondents on the mailback form understood and followed this instruction.

This question showed moderate inconsistency. The aggregate index was 25.0 (20.7 to 30.5). About 16.8 percent (13.5 to 20.1) of the respondents changed their response.

Only 1.7 percent (1.6 to 1.9) of the households in the CRS responded to this question. The data were collected as numbers from \$1 to \$99,999, and then put into 15 categories.

Indexes for the response categories have wide confidence intervals because of rare categories and small sample sizes.

Among each major subgroup type only one subgroup had large enough sample size to report the inconsistency level:

Subgroup type	Subgroup	Inconsistency level
Race	White householder	Moderate
Hispanic origin	Non-Hispanic householder	Moderate
Owner/renter status	Owner	Moderate
Collection type	Mailback	Moderate
Respondent type	Same respondent on both	Moderate

If we collapsed the categories to “less than \$100,” “\$100 to \$199,” “\$200 to \$299,” “\$300 to \$399,” and “\$400 or more,” we would the results shown in Table 67, below.

Table 67. Response measures for modified condominium costs

Census categories	Inconsistency level	Sample size	Percent in CRS category	Net difference rate		Gross difference rate		Index of inconsistency	
				Estimate	90-percent confidence interval	Estimate	90-percent confidence interval	Estimate	90-percent confidence interval
Less than \$100	Low	-	10.7	1.4	-0.2 to 3.1	3.2	1.9 to 5.2	15.7	9.6 to 25.7
\$100 to \$199	Low	-	52.6	-2.3	-5.1 to 0.5	9.8	7.4 to 13.0	19.7	14.8 to 26.0
\$200 to \$299	Moderate	-	21.4	1.4	-1.1 to 3.9	7.8	5.7 to 10.7	22.6	16.5 to 31.0
\$300 to \$399	Moderate	-	6.4	-0.9	-2.5 to 0.8	3.2	1.9 to 5.2	28.5	17.4 to 46.6
\$400 or more	Moderate	-	9.0	0.3	-1.7 to 2.3	4.9	3.3 to 7.3	29.7	20.0 to 44.1
Aggregate									
Total units	Moderate	346	-	-	-	14.5	11.3 to 17.6	21.8	17.7 to 27.1

The indexes for each category would have been all low or moderate. The aggregate index would have been moderate.

Mobile home (CRS 49, Census 58)

We asked the question about mobile home loans of all CRS respondents who reported that the structure was a mobile home in CRS question 30. This question changed from a one-part question in 1990 to a two-part question in 2000. The first part, which was added in 2000, read “Do you have an installment loan or contract on THIS mobile home?” The second part, about the actual cost, changed to include the cost for installment loans. In that way it was more able to capture the total costs (excluding real estate taxes) for mobile homes.

- Mobile home loan (CRS 49a, Census 58a)

This question asked if the respondent had an installment loan or contract on the residence, which was a mobile home. As on the census enumerator form, we asked this question only if the respondent indicated that the residence was a mobile home (CRS 30, Census 35) and someone in the household owned or was buying the mobile home.

This question was problematic. It showed a high level of inconsistency. The aggregate index was 60.6 (54.8 to 67.3). About 26.4 percent (23.7 to 29.2) changed their responses. Of the 26.4 percent of the respondents who changed their responses, 76.8 percent (71.6 to 81.9) said they did have an installment loan or contract on a mobile home on the CRS and 23.2 percent (18.1 to 28.4) said they did on the census.

The net difference rates were significantly differently from zero. That indicated that some model assumption for the index of inconsistency (independence or replication) failed.

Among the racial, Hispanic-origin, and home-ownership subgroups there were only enough data to determine the inconsistency level of households with white householders, non-Hispanic householders, and householders who were owners. There were enough data to determine the inconsistency for both collection-type and both respondent-type households. They all showed high inconsistency. As usual, households with the same respondent on both the census and the CRS showed less inconsistency than households with different respondents.

- Mobile home loan payment (CRS 49b, Census 58b)

This question asked the total cost for installment loan payments, personal property taxes, site rent, registration fees, and license fees on the mobile home and its site “last year.” We asked the same households as CRS question 49a. We collected the data as amounts from \$1 to \$99,999. Then we put it into 17 categories.

This question was problematic. It showed high inconsistency. This was not unexpected, since we had small sample sizes (ranging from 1 through 168) and many (17) categories. The aggregate index was 82.2 (76.9 to 89.3). Approximately 73.8 percent (68.2 to 79.4) changed their responses. There were only enough data to calculate the index of inconsistency for one subgroup in each of the subgroup types (white householder, non-Hispanic householder, owner, mailback, and same respondent).

The net difference rate for the response categories of the national sample was significantly different from zero only for “\$6,000 or more” (5.0 to 17.6). Individual indexes of inconsistency were either high, unstable, or undefined.

4.4 How consistent were census long-form data by census collection type?

Table I.1, in Appendix I, gives the aggregate inconsistency levels of housing characteristics by census collection type. It also gives z-values for comparing the inconsistency level of each characteristic. Tables 68, below, summarizes Table I.1. The Wilcoxon matched-pair signed-rank test showed that responses were less inconsistent for mailback responses than for responses collected by enumerators - for population characteristics ($z = 5.3$), for housing characteristics ($z = 4.8$), and for all characteristics together ($z = 7.1$). Previous researchers³ indicated that data collected by mail is more consistent than data collected by enumerators.

Table 68. Summary of inconsistency levels for characteristics by census collection type

Collection and characteristic type	Inconsistency level			
	Low	Moderate	High	Unstable, undefined, or insufficient data to calculate
Population				
Enumerator	11	20	22	5
Mailback	17	26	14	1

³Bushery, John M., Brick, J. Michael, Severynse, Jacqueline, and McGuinness, Richard A. (1996). “How interview mode affects data reliability,” Proceedings of the Section on Survey Research Methods, American Statistical Association, pp 600-604.

Table 68. Summary of inconsistency levels for characteristics by census collection type - Con.

Collection and characteristic type	Inconsistency level			
	Low	Moderate	High	Unstable, undefined, or insufficient data to calculate
Housing				
Enumerator	1	15	18	2
Mailback	9	10	17	0
Combined				
Enumerator	12	35	40	7
Mailback	26	36	31	1

4.5 How consistent were census long-form data by respondent type?

Tables I.2 and I.3, in Appendix I, give the aggregate inconsistency levels for population and housing characteristics, respectively by respondent type. We determined respondent type by CRS questions 28 and 50. “Proxy” refers to a respondent who was a household member but not the sample person. Table I.3 also gives z-values for comparing inconsistency levels by respondent type. Table 69 summarizes information from Tables I.2 and I.3.

Table 69. Summary of inconsistency levels for characteristics by respondent type

Collection and characteristic type	Inconsistency level			
	Low	Moderate	High	Unstable, undefined, or insufficient data to calculate
Population				
Self on both CRS and census	17	22	19	0
Self on CRS, proxy on census	14	16	21	7
Proxy on CRS, self on census	15	16	21	6
Same proxy on CRS	17	27	9	5
Different proxy	10	18	13	17
Housing				
Same respondent	9	10	17	0
Different respondent	1	15	18	2

We used the Hollander test for ordered alternatives to compare the overall inconsistency of the respondent-type subgroups for population characteristics. From top to bottom, from least inconsistent to most inconsistent, we list the respondent-type subgroups for population characteristics below ($z = 2.9$).

- Same proxy on CRS
- Different proxy
- Self on both CRS and census
- Self on CRS, proxy on census
- Proxy on CRS, self on census

We used the Wilcoxon matched-pair signed-rank test to compare the overall inconsistency of respondent-type subgroups for housing characteristics. Not surprisingly, housing data collected from the same respondent was significantly less inconsistent than data collected from a different respondent ($z = 4.8$).

In order to compare using the same respondent to using a different respondent for population items we collapsed the population respondent types as follows:

Same respondent:

Self on both CRS and census
Same proxy on CRS

Different respondent:

Self on CRS, proxy on census
Proxy on CRS, self on census
Different proxy

Population data collected from the same respondent were significantly less inconsistent than data collected from a different respondent ($z = 4.0$). For combined population and housing items, using the same respondent yielded significantly less inconsistent data than using a different respondent ($z = 4.8$).

For housing characteristics, we used z-tests to compare individual items across subgroups. The sample size for the different-respondent subgroup was insufficient to calculate the index for two items (condominium fee, mobile home payment) and the index was unstable for the question about meals included in the rent.

4.6 How did the inconsistency in 2000 compare to the inconsistency in 1990?

The Wilcoxon matched-pair signed-rank test showed that, overall, the aggregate inconsistency levels in 1990 and 2000 were not significantly different ($z = 0.5$) for the 28 items we compared.

Table 70 gives summary measures for those variables on the CRS 2000 that were analyzed in 1990 or 1980. If $z > 1.282$ then the earlier decade showed less inconsistency than 2000 (at the 90-percent confidence level). If $z < -1.282$, then 2000 showed less inconsistency than the previous decade (at the 90-percent confidence level). We did not compare the items if they had different numbers of response categories or if the questions were vastly different.

Table 70. Historical comparison

Question	Year	Sample size	Inconsistency level	Index of inconsistency		Z
				Estimate	90-percent confidence interval	
POPULATION CHARACTERISTICS						
Q9 Hispanic Origin						
(8 categories)	2000	18,880	Low	17.2	16.1 to 18.4	
(5 categories)	1990	23,979	Low	12.2	11.2 to 13.2	
(5 categories)	1980*	23,960	Low	13.0	11.3 to 14.2	

*95% confidence intervals are given here for 1980 indexes of inconsistency

Table 70. Historical comparison –Con.

Question	Year	Sample size	Inconsistency level	Index of inconsistency		Z
				Estimate	90-percent confidence interval	
Q10 Race						
(6 categories)		2000	19,044	Moderate	23.1	22.2 to 24.2
(15 categories)	B [#]	1990	24,539	Low	16.3	15.5 to 17.1
Q12a School Enrollment						
		2000	16,981	Low	13.5	12.8 to 14.3
		1990	23,292	Low	17.3	16.6 to 18.0
						-6.1
Q13 Educational Attainment						
		2000	16,750	Moderate	36.5	35.8 to 37.2
	B	1990	20,259	Moderate	32.3	31.7 to 32.9
(very different in 1980)		1980*	23,872	Moderate	35.0	33.9 to 35.5
						7.5
Q14 Ancestry						
(58 categories)		2000	9,051	Moderate	30.7	29.9 to 31.6
(36 categories)	B	1990	7,513	Moderate	26.5	25.6 to 27.4
(20 categories)	B	1980*	21,816	Moderate	26.0	25.4 to 26.9
Q15 Language Usage						
Q15a Speak other language (Yes/No)						
		2000	18,023	Moderate	22.7	21.6 to 23.9
	B	1990	21,752	Moderate	26.9	25.6 to 28.3
	B	1980*	22,478	Moderate	25.0	23.2 to 26.5
						-3.9
						-2.1
Q15b Which other language						
(40 categories; including English only)		2000	16,295	Low	17.9	16.9 to 19.1
(23 categories)	B	1990	1,261	Low	5.2	4.0 to 6.6
(14 categories)	B	1980*	1,533	Low	2.0	1.3 to 3.1
Q15c How well speak English						
		2000	2,003	High	59.5	56.8 to 62.5
	B	1990	1,834	High	60.3	57.4 to 63.4
						-0.3
Q16 Place of Birth						
(69 categories)		2000	16,671	Low	3.2	3.0 to 3.5
(59 categories)	B	1990	17,046	Low	4.9	4.6 to 5.2
(60 categories)	B	1980*	24,100	Low	6.0	6.2 to 6.8
Q17 Citizenship						
		2000	17,952	Low	9.8	9.0 to 10.8
	B	1990	23,406	Low	10.9	10.0 to 12.0
	B	1980*	23,884	High	73.0	70.9 to 74.9
						-1.3
						-54.6
Q18 Year of Entry						
		2000	1,523	Low	18.9	17.2 to 20.8
		1990	1,349	Moderate	23.0	21.1 to 25.2
	B	1980*	23,884	Low	13.0	11.2 to 15.8
						-2.5
						3.7
Q21 Disability						
Q21b Self-care limitation						
		2000	15,984	High	51.7	47.7 to 56.1
	B	1990	18,131	High	73.6	69.5 to 78.0
						-6.0
Q21c Mobility limitations						
		2000	12,883	High	64.5	61.3 to 67.9
	B	1990	18,417	Moderate	47.1	44.2 to 50.2
						6.4

*95% confidence intervals are given here for 1980 indexes of inconsistency

B indicated response-bias analysis for particular decades.

Table 70. Historical comparison –Con.

Question	Year	Sample size	Inconsistency level	Index of inconsistency		Z	
				Estimate	90-percent confidence interval		
Q21d Work disability							
difficulty		2000	12,655	High	80.5	78.0 to 83.0	
limits	B [#]	1990	15,578	Moderate	43.0	40.9 to 45.1	
prevents			1,548	Moderate	45.7	42.4 to 49.3	
Q24a Military Service							
		2000	13,133	Low	18.7	17.5 to 20.0	
	B	1990	18,364	Low	8.5	7.9 to 9.2	11.9
Q24b Period of Military Service							
Q24b3 September 1980 through July 1990							
		2000	1,629	Moderate	29.5	25.2 to 34.6	
	B	1990	2,116	Low	18.2	14.4 to 23.0	2.9
Q24b4 May 1975 through August 1980							
		2000	1,629	Moderate	44.9	38.7 to 52.1	
	B	1990	2,116	Moderate	24.9	20.8 to 29.7	4.1
Q24b5 Vietnam era							
		2000	1,629	Low	17.3	14.9 to 20.2	
	B [#]	1990	2,116	Low	7.5	6.1 to 9.1	5.3
Q24b6 February 1955 through July 1964							
		2000	1,629	Moderate	31.5	27.4 to 36.2	
	B	1990	2,116	Moderate	34.6	31.5 to 38.1	-0.9
Q24b7 Korean conflict							
		2000	1,629	Low	17.2	14.2 to 20.8	
	B	1990	2,116	Low	8.2	6.6 to 10.2	3.9
Q24b8 World War II							
		2000	1,629	Low	7.8	6.1 to 9.9	
	B	1990	2,116	Low	3.4	2.6 to 4.5	3.4
Q24b9 Some other time							
		2000	1,629	High	93.0	74.7 to 100.0 [‡]	
	B	1990 [†]	2,116	High	93.7	84.4 to 100.0 [‡]	-0.1
Q24c Years of Military Service							
		2000	1,487	Moderate	41.6	36.3 to 47.6	
	B	1990 [†]	1,343	High	58.8	48.9 to 68.7	-2.5
Q25 Work Experience in 1999							
Q25a Worked in 1999							
		2000	10,329	Moderate	24.3	22.8 to 25.9	
	B	1990	15,063	Moderate	45.9	44.6 to 47.3	-17.3
Q25b Weeks worked in 1999							
		2000	7,297	High	57.5	55.5 to 59.6	
	B	1990	11,337	High	56.8	55.4 to 58.3	0.5
Q25c Usual hours worked per week in 1999							
		2000	7,480	Moderate	34.3	32.4 to 36.2	
	B	1990	11,354	Moderate	40.1	38.6 to 41.7	-3.9

B indicated response-bias analysis for particular decades.

† Originally 5 categories were given; In 2000 we collapsed to 2 categories and recalculated

‡ Values higher than 100 are truncated to 100.0.

Table 70. Historical comparison –Con.

Question	Year	Sample size	Inconsistency level	Index of inconsistency		Z	
				Estimate	90-percent confidence interval		
HOUSING CHARACTERISTICS							
Q29 Tenure							
		2000	18,420	Low	19.4	18.8 to 20.0	
	B [#]	1990	10,314	Low	13.3	12.6 to 14.0	10.9
		1980 [*]	8,705	Low	8.0	7.2 to 9.1	18.8
Q30 Description of Building							
		2000	18,290	Moderate	20.8	20.0 to 21.5	
		1990	10,418	Moderate	21.9	21.0 to 23.0	-1.4
Q31 Year Built							
		2000	15,547	Moderate	29.3	28.6 to 29.9	
Including “Don’t know”	B	1990	9,825	Moderate	40.6	39.7 to 41.5	
Excluding “Don’t know”			7,839	Moderate	27.6	26.7 to 28.6	2.4
				Moderate	26.2	25.2 to 27.2	
				Moderate	36.9	34.3 to 39.8	
Q35 Plumbing Facilities							
		2000	18,393	High	85.2	74.3 to 97.7	
	B	1990	10,035	High	53.8	45.1 to 64.2	3.4
	B	1980 [*]	8,730	Moderate	47.0	39.6 to 55.7	4.7
Q38 Heating Fuel							
		2000	17,315	Low	17.7	17.1 to 18.3	
		1980 [*]	8,570	Low	14.0	12.7 to 14.8	5.7
Q39 Number of Autos, Vans, and Trucks							
		2000	18,149	Moderate	37.1	36.4 to 37.9	
	B	1990	9,881	Moderate	32.1	31.1 to 33.1	6.6
autos	B	1980 [*]	8,596	Moderate	34.0	32.1 to 35.1	
vans/trucks			8,289	Moderate	26.0	24.6 to 28.3	
Q40a Property Usage (commercial establishment or medical office)							
		2000	13,627	High	65.8	61.6 to 70.2	
		1980 [*]	6,287	Moderate	50.0	41.6 to 60.7	2.9
Q40b Size of Lot							
		2000	13,244	Moderate	20.9	20.0 to 22.0	
		1990	7,815	Moderate	27.8	26.4 to 29.4	-6.3
Q40c Agricultural Sales							
		2000	3,645	High	52.0	47.1 to 57.4	
		1990	1,472	Moderate	41.7	36.2 to 48.2	2.1
Q42a Monthly Rent							
(23 categories)		2000	3,997	Moderate	23.2	22.1 to 24.4	
(26 categories)	B	1990	2,449	Moderate	34.7	33.1 to 36.4	
Q42b Meals Included in Rent							
		2000	3,854	Moderate	38.2	28.9 to 50.6	
	B	1990 [@]	2,463	High	71.6	42.8 to 119.8 [@]	-1.4

*95% confidence intervals are given here for 1980 indexes of inconsistency

B indicated response-bias analysis for particular decades.

@ The 1990 report said there were not enough data to calculate the index, so we calculated it in 2000.

5. Recommendations

The United States currently plans to replace the long form of the decennial census with a current survey, the American Community Survey (ACS). Our recommendations apply to the ACS and also to the overlap between the ACS and the 2010 census. If there is a long form in 2010, our recommendations apply to it as well.

Use cognitive experts to recommend improvements for problematic questions. Evaluate new and revised questions in CRSs of the ACS and the 2010 census to determine if reliability has been improved.

Plan the content reinterview surveys of the 2010 census and the ACS as early as possible, preferably not as add-ons. In this way, the content reinterview program can be used to systematically evaluate and improve the ACS. Since we are concerned with the quality of the original survey data, the CRSs need to be planned concurrently with the surveys.

Use the results from content tests in developing questionnaires for the 2010 census and the ACS. Document decisions that contradict suggestions based on the content tests. The Census Bureau has run national content surveys (NCSs) prior to decennial censuses, in order to test ways of asking questions. NCSs test both wording and question placement. Such tests need to be done in such a way that the NCS results can be implemented for the survey in question. This did not always happen for Census 2000. In the National Content Survey report on Units in Structure⁴, Bonnette recommended that we use “Boat, van, tent, etc.” rather than “Boat, RV, van, etc.” and “Manufactured mobile home” rather than “mobile home.” The NCS report did not indicate why the changes were not implemented.

To the extent possible, use the same data collection modes, data capture methods and hardware/software, data processing procedures, and enumerators for both the 2010 census and its CRS, and for the both the ACS and its CRS. In order to more easily analyze the CRS data, we need to use the same data capture methods, the same processing, and the same enumerators. In 2000 this did not happen. There was not enough sharing of information in the planning stages of the 2000 CRS.

Know the data capture error rates (and do what is necessary to lower them) prior to data collection for the ACS and the 2010 census. In order to properly understand census data, it is extremely important to know the error rates for data capture. We need to know these error rates prior to collecting the data, for both the original survey and the content reinterview survey. This type of quality assurance needs to be built into the system.

Provide better instructions on the 2010 census and the ACS for the Hispanic-origin question. Lack of instructions adversely affected this question in 2000. Since the instructions did not specify that the respondent should mark one category only instead of all that applied, a number of respondents marked more than one category. We must provide more (and better) instructions

⁴Bonnette, Robert W. (1997). “1996 National Content Survey: Units in Structure,” Internal U.S. Census Bureau report, page 8.

for this question on the 2010 census and the ACS.

Use separate “Yes/No” questions for each response category of “mark all that apply” questions. Previous work⁵ has shown that the “mark all that apply” format leads to questionable data. We should use separate “Yes/No” questions for each response category of “mark all that apply” questions to get better-quality data.

For time-sensitive questions, refer to the date of the original survey in the CRS, for both the ACS and the 2010 census. Most notably, the question about telephone service is time-sensitive. The telephone question, associated with the rare population of households in the United States that do not have telephone service, is especially problematic. This question is time-sensitive because households that do not have telephone service might change their status from month to month. Time-sensitive questions need to have better time reference. Although the respondent might still answer the questions using the date of CRS as the reference date, time reference in the questions might clear up some of the variation in response. Our suggestion is to refer to the date of the original survey (on both ACS and CRS) and to run the CRS with less time lag between it and the original survey.

Conduct the CRSs of the ACS and the 2010 census within three or four weeks of completing the original data collection. Long time lags between the ACS and its CRS may lead to confusion in time reference and memory problems. Inherent problems with inconsistency for questions may be confounded by long time lags between the ACS and its CRS. Carry out the CRS within three to four weeks of completing the ACS.

Create a database linking all changes to Master Address File identifiers. MAFIDs for some households changed between the time the DMAF was created and the time the CRS was collected. It was difficult and time-consuming to find Census 2000 cases corresponding to CRS cases because MAFIDs for some cases had changed. With a single database of MAFID changes, the CRS could proceed more quickly and accurately.

In addition to these recommendations for the ACS and the 2010 census above, our recommendations for future research on the CRS for Census 2000 follow.

- **Analyze inconsistency by time lag between the CRS and Census 2000.** This would help determine how much inconsistency in key questions is inherent to the questions and how much inconsistency is due to time lag.
- **Determine the characteristics related to high inconsistency and then do multivariate analysis (of key questions) with respect to those characteristics.** Using the results of

⁵Bushery, J., Royce, D., and Kasprzyk, D. (1992). "The Schools and Staffing Survey: How reinterview measures data quality," Proceedings of the Section on Survey Research Methods, American Statistical Association.

Rasinski, K., Mingay, D., and Bradburn, N. (1994). "Do respondents really 'Mark all that apply' on self-administered questions?" Public Opinion Quarterly, American Association for Public Opinion Research, 58:400-408.

the multivariate analysis that would indicate how those characteristics influence inconsistency would help develop more consistent questions.

- **Analyze inconsistency in responses to questions on plumbing facilities, kitchen facilities, and telephone service by the value of the property.**

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Appendix A:
**CONTENT REINTERVIEW SURVEY QUESTIONNAIRE
 AND CENSUS 2000 ENUMERATOR QUESTIONNAIRE**

OMB No. 0607-0869: Approval Expires 12/31/2000

FORM **D-1010**
 (5-10-2000)

U.S. DEPARTMENT OF COMMERCE
 BUREAU OF THE CENSUS

**CONTENT REINTERVIEW SURVEY
 United States Census 2000**

SECTION 1 – IDENTIFICATION

Interviewer

--	--	--	--

Interviewer Name

Regional Office

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SECTION 2 – RECORD OF CONTACTS

Type	Month	Day	Time		Comments, appointments, telephone number
<input type="checkbox"/> Telephone				<input type="checkbox"/> a.m.	
<input type="checkbox"/> Personal	<input type="text"/>	<input type="text"/>	<input type="text"/> : <input type="text"/>	<input type="checkbox"/> p.m.	
<input type="checkbox"/> Telephone				<input type="checkbox"/> a.m.	
<input type="checkbox"/> Personal	<input type="text"/>	<input type="text"/>	<input type="text"/> : <input type="text"/>	<input type="checkbox"/> p.m.	
<input type="checkbox"/> Telephone				<input type="checkbox"/> a.m.	
<input type="checkbox"/> Personal	<input type="text"/>	<input type="text"/>	<input type="text"/> : <input type="text"/>	<input type="checkbox"/> p.m.	
<input type="checkbox"/> Telephone				<input type="checkbox"/> a.m.	
<input type="checkbox"/> Personal	<input type="text"/>	<input type="text"/>	<input type="text"/> : <input type="text"/>	<input type="checkbox"/> p.m.	
<input type="checkbox"/> Telephone				<input type="checkbox"/> a.m.	
<input type="checkbox"/> Personal	<input type="text"/>	<input type="text"/>	<input type="text"/> : <input type="text"/>	<input type="checkbox"/> p.m.	
<input type="checkbox"/> Telephone				<input type="checkbox"/> a.m.	
<input type="checkbox"/> Personal	<input type="text"/>	<input type="text"/>	<input type="text"/> : <input type="text"/>	<input type="checkbox"/> p.m.	

SECTION 3 – FINAL STATUS

<input type="checkbox"/> Telephone	<input type="checkbox"/> Personal
<input type="checkbox"/> 201 Complete Interview	<input type="checkbox"/> 219 Type A – Other (explain)
<input type="checkbox"/> 202 Partial Interview	<input type="checkbox"/> 226 Type B – Vacant
<input type="checkbox"/> 214 Type A – Unable to locate	<input type="checkbox"/> 233 Type B – Other (explain)
<input type="checkbox"/> 216 Type A – No one home	<input type="checkbox"/> 240 Type C – Demolished
<input type="checkbox"/> 217 Type A – Temporarily absent	<input type="checkbox"/> 247 Type C – Other (explain)
<input type="checkbox"/> 218 Type A – Refusal	<input type="checkbox"/> 501 Type D – Whole household moved

Contact person for Type B/C/D	
Title/Company/Affiliation	
Address	
Telephone	Best time to call
	<input type="checkbox"/> Day <input type="checkbox"/> Either
	<input type="checkbox"/> Evening

Notes

5b. HOUSEHOLD PERSON ROSTER

SAMPLE PERSON

Person 1 – First Name MI
Last Name

If this is last row filled, sample person is person number

Person 2 – First Name MI
Last Name

If this is last row filled, sample person is person number

Person 3 – First Name MI
Last Name

If this is last row filled, sample person is person number

Person 4 – First Name MI
Last Name

If this is last row filled, sample person is person number

Person 5 – First Name MI
Last Name

If this is last row filled, sample person is person number

Person 6 – First Name MI
Last Name

If this is last row filled, sample person is person number

Person 7 – First Name MI
Last Name

If this is last row filled, sample person is person number

Person 8 – First Name MI
Last Name

If this is last row filled, sample person is person number

Person 9 – First Name MI
Last Name

If this is last row filled, sample person is person number

Person 10 – First Name MI
Last Name

If this is last row filled, sample person is person number

Person 11 – First Name MI
Last Name

If this is last row filled, sample person is person number

Person 12 – First Name MI
Last Name

If this is last row filled, sample person is person number

11. What was (your/...’s) marital status on April 1, 2000?

- Now married
- Widowed
- Divorced
- Separated
- Never married

12a. At any time between February 1, 2000, and April 1, 2000, (were you/was...) attending regular school or college? Include only nursery school or preschool, kindergarten, elementary school, and schooling which leads to a high school diploma or a college degree.

If "Yes," ASK – Was it public or private?

- No, was not attending between February 1 and April 1 → *Skip to 13*
- Yes, public school or public college
- Yes, private school or private college

12b. What grade or level (were you/was...) attending? Mark ONE box.

- Nursery school, preschool
- Kindergarten
- Grade 1 to grade 4
- Grade 5 to grade 8
- Grade 9 to grade 12
- College undergraduate years (freshman to senior)
- Graduate or professional school (*for example: medical, dental, or law school*)

20. (Do you/Does...) have any of the following long-lasting conditions:

20a. Blindness, deafness, or a severe vision or hearing impairment?

- Yes
 No

20b. A condition that substantially limits one or more basic physical activities such as walking, climbing stairs, reaching, lifting, or carrying?

- Yes
 No

21. Because of a physical, mental, or emotional condition lasting 6 months or more, (do you/does...) have any difficulty in doing any of the following activities:

21a. Learning, remembering, or concentrating?

- Yes
 No

21b. Dressing, bathing, or getting around inside the home?

- Yes
 No

21c. ASK if this person is 16 YEARS OLD OR OVER.

Going outside the home alone to shop or visit a doctor's office?

- Yes
 No

21d. ASK if this person is 16 YEARS OLD OR OVER.

Working at a job or business?

- Yes
 No

22. INTERVIEWER INSTRUCTION – Refer to question 8 on page 4 to mark a response box below.

- Born on or before April 1, 1985 or at least age 15 by April 1, 2000 – Ask 23a
 Born after April 1, 1985 → Skip to 28a

If question 8 is blank, ASK –

(Were you/Was...) under 15 years of age on April 1, 2000?

- Yes → Skip to 28a
 No → Ask 23a

23a. (Did you/Did...) have any of (your/his/her) own grandchildren under the age of 18 living in this (house/apartment) on April 1, 2000?

- Yes
- No → *Skip to 24a*

23b. (Were you/Was...) responsible for most of the basic needs of any grandchild(ren) under the age of 18 who lived in this (house/apartment) on April 1, 2000?

- Yes
- No → *Skip to 24a*

23c. How long (were you/was...) responsible for the(se) grandchild(ren)? If more than one grandchild lives with (you/...), answer the question for the grandchild for whom (you/...) had been financially responsible for the longest period of time.

- Less than 6 months
- 6 to 11 months
- 1 or 2 years
- 3 or 4 years
- 5 years or more

24a. (Have you/Has...) ever served on active duty in the U.S. Armed Forces, military Reserves, or National Guard? Active duty does not include training for the Reserves or National Guard, but DOES include activation, for example, for the Persian Gulf War.

- Yes, now on active duty
- Yes, on active duty in past, but not now
- No, training for Reserves or National Guard only → *Skip to 25a*
- No, never served in the military → *Skip to 25a*

24b. (Show Card E.) When did (you/...) serve on active duty in the U.S. Armed Forces? Mark a box for EACH period served.

After each response ASK – Any other time?

- April 1995 or later
- August 1990 to March 1995 (including Persian Gulf War)
- September 1980 to July 1990
- May 1975 to August 1980
- Vietnam era (August 1964 to April 1975)
- February 1955 to July 1964
- Korean conflict (June 1950 to January 1955)
- World War II (September 1940 to July 1947)
- Some other time

24c. In total, how many years of active-duty military service (have you/has ...) had?

- Less than 2 years
- 2 years or more

25a. LAST YEAR, 1999, did (you/...) work at a job or business at any time?

- Yes
 No → *Skip to 26*

25b. How many weeks did (you/...) work in 1999? Count paid vacation, paid sick leave, and military service.

Weeks

25c. During the weeks WORKED in 1999, how many hours did (you/...) usually work each WEEK?

Usual hours worked each WEEK

26. The next set of questions is about each income source received during 1999 by (you/...). If the net income was a loss, please give the dollar amount of the loss. For income received jointly, report, if possible, the appropriate share for (you/...); otherwise, report the whole amount if (you were/... was) the primary recipient, "No" otherwise. If exact amount is not known, please give best estimate. If net income is a loss, mark the "Loss" box next to the dollar amount.

26a. Did (you/...) receive any wages, salary, commissions, bonuses or tips in 1999?

- Yes – **What was the amount from all jobs before deductions for taxes, bonds, dues, or other items?**
Annual amount – Dollars
\$, .00
 No

26b. Did (you/...) have any self-employment income from own nonfarm businesses or farm businesses, including proprietorships and partnerships in 1999?

- Yes – **What was the net income after business expenses?**
Annual amount – Dollars
\$, .00 Loss
 No

26c. Did (you/...) receive any interest, dividends, net rental income, royalty income, or income from estates and trusts in 1999? Report even small amounts credited to an account.

- Yes – **What was the amount?**
Annual amount – Dollars
\$, .00 Loss
 No

26d. Did (you/...) receive any Social Security or Railroad Retirement income in 1999?

Yes – **What was the amount?**

Annual amount – Dollars

\$, .00

No

26e. Did (you/...) receive any Supplemental Security Income (SSI) in 1999?

Yes – **What was the amount?**

Annual amount – Dollars

\$, .00

No

26f. Did (you/...) receive any public assistance or welfare payments from the state or local welfare office in 1999?

Yes – **What was the amount?**

Annual amount – Dollars

\$, .00

No

26g. Did (you/...) receive retirement, survivor, or disability pensions in 1999? Do NOT include Social Security.

Yes – **What was the amount?**

Annual amount – Dollars

\$, .00

No

26h. Did (you/...) have any other sources of income received regularly such as Veterans' (VA) payments, unemployment compensation, child support, or alimony in 1999? Do not include lump-sum payments such as money from an inheritance or sale of a home.

Yes – **What was the amount?**

Annual amount – Dollars

\$, .00

No

27. *Do not ask this question if 26a–26h are completed. Instead sum these entries and subtract any losses. Enter the amount below. If total amount was a loss, mark the "Loss" box next to the amount.*

What was (your/...'s) total income in 1999?

Annual amount – Dollars

None OR \$, .00 Loss

28a. CHECK ITEM – Was the selected sample person answering for himself/herself?

- Yes → Ask 28b
- No → Skip to 28c

28b. On the Census 2000 form that was completed for your household, did you provide most of the answers about yourself or was this information provided by another household member? Mark the appropriate box.

- CRS respondent answered for himself/herself in Census 2000 → Skip to 29
- Information was provided by another household member in Census 2000 → Skip to 29
- Don't know/refused → Skip to 29

28c. On the Census 2000 form that was completed for your household, did (...) provide most of the answers about (him/her)self, did you provide this information for (...), or was this information provided by another household member? Mark the appropriate box.

- Sample person answered for himself/herself in Census 2000
- CRS respondent answered for sample person in Census 2000
- Information was provided by another household member in Census 2000
- Don't know/refused

The next set of questions is about your household.

29. Is this (house/apartment/mobile home) —

- 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, or**
- Occupied without payment of cash rent?**

30. (Show Card G.) Which of these categories best describes this building? Include all apartments, flats, etc., even if vacant.

- A mobile home
- A one-family house detached from any other house
- A one-family house attached to one or more houses
- A building with 2 apartments
- A building with 3 or 4 apartments
- A building with 5 to 9 apartments
- A building with 10 to 19 apartments
- A building with 20 to 49 apartments
- A building with 50 or more apartments
- Boat, RV, van, etc.

31. About when was this building first built?

- | | |
|---------------------------------------|--|
| <input type="checkbox"/> 1999 or 2000 | <input type="checkbox"/> 1960 to 1969 |
| <input type="checkbox"/> 1995 to 1998 | <input type="checkbox"/> 1950 to 1959 |
| <input type="checkbox"/> 1990 to 1994 | <input type="checkbox"/> 1940 to 1949 |
| <input type="checkbox"/> 1980 to 1989 | <input type="checkbox"/> 1939 or earlier |
| <input type="checkbox"/> 1970 to 1979 | |

32. When did you move into this (house/apartment/mobile home)?

- | | |
|---------------------------------------|--|
| <input type="checkbox"/> 1999 or 2000 | <input type="checkbox"/> 1980 to 1989 |
| <input type="checkbox"/> 1995 to 1998 | <input type="checkbox"/> 1970 to 1979 |
| <input type="checkbox"/> 1990 to 1994 | <input type="checkbox"/> 1969 or earlier |

33. How many rooms do you have in this (house/apartment/mobile home)? Do NOT count bathrooms, porches, balconies, foyers, halls, or half-rooms.

Rooms

--	--

34. How many bedrooms do you have; that is, how many would you list if this (house/apartment/mobile home) were on the market for sale or rent?

- | | |
|-------------------------------------|---|
| <input type="checkbox"/> None | <input type="checkbox"/> 3 bedrooms |
| <input type="checkbox"/> 1 bedroom | <input type="checkbox"/> 4 bedrooms |
| <input type="checkbox"/> 2 bedrooms | <input type="checkbox"/> 5 or more bedrooms |

35. Do you have COMPLETE plumbing facilities in this (house/apartment/mobile home); that is, 1) hot and cold piped water, 2) a flush toilet, and 3) a bathtub or shower?

- Yes, have all three facilities
 No

36. Do you have COMPLETE kitchen facilities in this (house/apartment/mobile home); that is, 1) a sink with piped water, 2) a range or stove, and 3) a refrigerator?

- Yes, have all three facilities
 No

37. Is there telephone service available in this (house/apartment/mobile home) from which you can both make and receive calls?

- Yes
 No

38. (Show Card H.) Which FUEL is used MOST for heating this (house/apartment/mobile home)?

- Gas: from underground pipes serving the neighborhood
- Gas: bottled, tank, or LP
- Electricity
- Fuel oil, kerosene, etc.
- Coal or coke
- Wood
- Solar energy
- Other fuel
- No fuel used

39. How many automobiles, vans, and trucks of one-ton capacity or less are kept at home for use by members of your household?

Vehicles

40. REFER TO 30. Ask 40a, 40b, and 40c, ONLY if this is a ONE-FAMILY HOUSE OR MOBILE HOME. All others skip to 41.

40a. Is there a business (such as a store or barber shop) or a medical office on this property?

- Yes
- No

40b. How many acres is this (house/mobile home) on?

- Less than 1 acre → *Skip to 41*
- 1 to 9.9 acres
- 10 or more acres

40c. In 1999, what were the actual sales of all agricultural products from this property?

- None
- \$1 to \$999
- \$1,000 to \$2,499
- \$2,500 to \$4,999
- \$5,000 to \$9,999
- \$10,000 or more

41. What is the annual cost for – *If the respondent has lived here less than 1 year, ask him/her to estimate the annual cost.*

41a. Electricity?

Annual cost – Dollars

\$, .00

OR

- Included in rent or in condominium fee
 No charge or electricity not used

41b. Gas?

Annual cost – Dollars

\$, .00

OR

- Included in rent or in condominium fee
 No charge or gas not used

41c. Water and sewer?

Annual cost – Dollars

\$, .00

OR

- Included in rent or in condominium fee
 No charge

41d. Oil, coal, kerosene, wood, etc.?

Annual cost – Dollars

\$, .00

OR

- Included in rent or in condominium fee
 No charge or these fuels not used

42. REFER TO 29. Ask 42a and 42b ONLY if RENT is paid for this (house/apartment/mobile home) – All others skip to 43

42a. What was the monthly rent as of April 1, 2000?

Monthly amount – Dollars

\$, .00

42b. Did the monthly rent include any meals?

- Yes
 No

43. REFER TO 29. Ask 43a to 49b if someone in the household OWNS or IS BUYING this house, apartment, or mobile home; otherwise, skip to 50.

43a. On April 1, 2000, did you have a mortgage, deed of trust, contract to purchase, or similar debt on THIS property?

- Yes, mortgage, deed of trust, or similar debt
- Yes, contract to purchase
- No → Skip to 44a

43b. On April 1, 2000, how much was your regular monthly mortgage payment on THIS property? Include payment only on first mortgage or contract to purchase.

Monthly amount – Dollars

\$, .00

OR

- No regular payment required → Skip to 44a

43c. On April 1, 2000, did your regular monthly mortgage payment include payments for real estate taxes on THIS property?

- Yes, taxes included in mortgage payment
- No, taxes paid separately or taxes not required

43d. On April 1, 2000, did your regular monthly mortgage payment include payments for fire, hazard, or flood insurance on THIS property?

- Yes, insurance included in mortgage payment
- No, insurance paid separately or no insurance

44a. On April 1, 2000, did you have a second mortgage or a home equity loan on THIS property? Mark all boxes that apply.

If "Yes," ASK – Which ones?

- Yes, a second mortgage
- Yes, a home equity loan
- No → Skip to 45

44b. On April 1, 2000, how much was your regular monthly payment on all second or junior mortgages and all home equity loans on THIS property?

Monthly amount – Dollars

\$, .00

OR

- No regular payment required

45. What were the real estate taxes on THIS property last year?

Yearly amount – Dollars

\$, .00

OR

- None

46. What was the annual payment for fire, hazard, and flood insurance on THIS property?

Annual cost – Dollars

\$, .00

OR

None

47. (Show Card I.) What is the value of this property; that is, how much do you think this (house and lot/apartment/mobile home and lot) would sell for if it were for sale?

- | | |
|---|---|
| <input type="checkbox"/> Less than \$10,000 | <input type="checkbox"/> \$90,000 to \$99,999 |
| <input type="checkbox"/> \$10,000 to \$14,999 | <input type="checkbox"/> \$100,000 to \$124,999 |
| <input type="checkbox"/> \$15,000 to \$19,999 | <input type="checkbox"/> \$125,000 to \$149,999 |
| <input type="checkbox"/> \$20,000 to \$24,999 | <input type="checkbox"/> \$150,000 to \$174,999 |
| <input type="checkbox"/> \$25,000 to \$29,999 | <input type="checkbox"/> \$175,000 to \$199,999 |
| <input type="checkbox"/> \$30,000 to \$34,999 | <input type="checkbox"/> \$200,000 to \$249,999 |
| <input type="checkbox"/> \$35,000 to \$39,999 | <input type="checkbox"/> \$250,000 to \$299,999 |
| <input type="checkbox"/> \$40,000 to \$49,999 | <input type="checkbox"/> \$300,000 to \$399,999 |
| <input type="checkbox"/> \$50,000 to \$59,999 | <input type="checkbox"/> \$400,000 to \$499,999 |
| <input type="checkbox"/> \$60,000 to \$69,999 | <input type="checkbox"/> \$500,000 to \$749,999 |
| <input type="checkbox"/> \$70,000 to \$79,999 | <input type="checkbox"/> \$750,000 to \$999,999 |
| <input type="checkbox"/> \$80,000 to \$89,999 | <input type="checkbox"/> \$1,000,000 or more |

48a. Is this (house/apartment/mobile home) part of a condominium?

Yes

No → *Skip to 49*

48b. What was the monthly condominium fee on April 1, 2000?

Monthly amount – Dollars

\$, .00

49. REFER TO 30. Ask 49a and 49b ONLY if this is a MOBILE HOME.

49a. On April 1, 2000, did you have an installment loan or contract on THIS mobile home?

Yes

No

49b. What was the total cost for installment loan payments, personal property taxes, site rent, registration fees, and license fees on THIS mobile home and its site last year? Exclude real estate taxes.

Yearly amount – Dollars

\$, .00

50. On the Census 2000 form that was completed for your household, did you provide most of the answers for the household questions, or was this information provided by another household member?

- CRS respondent provided household answers
- Another household member provided household answers
- Don't know/refused

51. (Ask only on personal visit)
In case we need to contact you, what is your telephone number and the best time to call?

Area code Telephone number Extension
□□□ — □□□□ — □□□□□ — □□□□□

- Day
- Evening
- Either

52. CHECK ITEM – In what language was this interview primarily conducted?

- English
- Spanish
- Other

Conclude interview by reading following:

Thank you for your cooperation.

The U.S. Office of Management and Budget has approved this survey and has assigned 0607-0869 as the survey's number.

Comments may be sent to:

**Associate Director for Finance and Administration
Paperwork Reduction Act Project 0607-0869
Room 3104, Federal Building 3
Bureau of the Census
Washington, DC 20233-0001**

**My office may check to see if I have done my job properly.
Therefore you may receive a call checking on my work.
Thank you again.**

ENUMERATOR QUESTIONNAIRE

United States Census 2000

Continuation form(s) attached

Number of continuation forms for this address

LCO	State	County	Tract	Block
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
AA	Map Spot	Unit ID		
<input type="text"/>	<input type="text"/>	<input type="text"/>		
← APPLY LABEL HERE →				
House No.	Street name, Rural route and box, or PO box			
<input type="text"/>	<input type="text"/>			
Apt. No. or Location	<input type="text"/>			
<input type="text"/>	<input type="text"/>			
City	State	ZIP Code		
<input type="text"/>	<input type="text"/>	<input type="text"/>		

RECORD OF CONTACT

Type	Month	Day	Time	Outcome	Type	Month	Day	Time	Outcome
<input checked="" type="checkbox"/> Personal	<input type="text"/>	<input type="text"/>	<input type="text"/> : <input type="text"/>	<input type="checkbox"/> a.m. <input type="checkbox"/> p.m.	<input type="checkbox"/> Personal	<input type="text"/>	<input type="text"/>	<input type="text"/> : <input type="text"/>	<input type="checkbox"/> a.m. <input type="checkbox"/> p.m.
<input type="checkbox"/> Personal	<input type="text"/>	<input type="text"/>	<input type="text"/> : <input type="text"/>	<input type="checkbox"/> a.m. <input type="checkbox"/> p.m.	<input type="checkbox"/> Telephone	<input type="text"/>	<input type="text"/>	<input type="text"/> : <input type="text"/>	<input type="checkbox"/> a.m. <input type="checkbox"/> p.m.
<input type="checkbox"/> Telephone	<input type="text"/>	<input type="text"/>	<input type="text"/> : <input type="text"/>	<input type="checkbox"/> a.m. <input type="checkbox"/> p.m.	<input type="checkbox"/> Personal	<input type="text"/>	<input type="text"/>	<input type="text"/> : <input type="text"/>	<input type="checkbox"/> a.m. <input type="checkbox"/> p.m.
<input type="checkbox"/> Personal	<input type="text"/>	<input type="text"/>	<input type="text"/> : <input type="text"/>	<input type="checkbox"/> a.m. <input type="checkbox"/> p.m.	<input type="checkbox"/> Telephone	<input type="text"/>	<input type="text"/>	<input type="text"/> : <input type="text"/>	<input type="checkbox"/> a.m. <input type="checkbox"/> p.m.
<input type="checkbox"/> Telephone	<input type="text"/>	<input type="text"/>	<input type="text"/> : <input type="text"/>	<input type="checkbox"/> a.m. <input type="checkbox"/> p.m.	<input type="checkbox"/> Personal	<input type="text"/>	<input type="text"/>	<input type="text"/> : <input type="text"/>	<input type="checkbox"/> a.m. <input type="checkbox"/> p.m.
<input type="checkbox"/> Personal	<input type="text"/>	<input type="text"/>	<input type="text"/> : <input type="text"/>	<input type="checkbox"/> a.m. <input type="checkbox"/> p.m.	<input type="checkbox"/> Telephone	<input type="text"/>	<input type="text"/>	<input type="text"/> : <input type="text"/>	<input type="checkbox"/> a.m. <input type="checkbox"/> p.m.

OUTCOME CODES: NV = Left notice of visit NC = No contact RE = Refusal CI = Conducted interview OT = Other

CERTIFICATION

I certify that the entries I have made on this questionnaire are true and correct to the best of my knowledge.
Enumerator's signature and date

Crew Leader's initials	CLD number
<input type="text"/>	<input type="text"/>
Month	Day
<input type="text"/>	<input type="text"/>

INTRODUCTION

- S1. Hello, I'm (Your name) from the Census Bureau. (Show ID card.) Is this (Read address)?**
 Yes - Continue with question S2
 No - Ask: **Can you tell me where to find (Read address)? END INTERVIEW**
- S2. I'm here to complete a census questionnaire for this address. It should take about 30 minutes. This notice (Hand respondent a Privacy Act Notice) explains that your answers are kept confidential. Did you or anyone in this household live here on Saturday, April 1, 2000?**
 Yes - Continue with question S3 No → Skip to question S4
- S3. Is this (house/apartment/mobile home) a vacation or seasonal home, or only occasionally occupied by your household?**
 Yes → Skip to question 35 on page 8, and ask the double-underlined questions (35, 36, 38-41, and 45a-b).
 • If the unit is "For rent," ask questions 47a-b. If the unit is "For sale only," ask question 56.
 • Then complete items A, B, and C in the "Interview Summary" block and refer to Card J.
 No → Skip to S5
- S4. On April 1, 2000 was this unit —**
 Vacant → Skip to question 35 and ask the double-underlined questions (35, 36, 38-41, and 45a-b).
 • If the unit was "For rent," ask questions 47a-b. If the unit was "For sale only," ask question 56.
 • Then complete items A, B, and C in the "Interview Summary" block and refer to Card K.
 Occupied by a different household? Using a knowledgeable respondent, complete this questionnaire for the Census Day household and refer to Card K.
- S5. How many people were living or staying in this (house/apartment/mobile home) on April 1, 2000?**
 Number of people

ENUMERATOR NOTE: For questions 2 through 6, prompt respondent with names if needed, for example, "Let's start with Bob."

1. What is each person's name? Start with the name of a person who owns, is buying, or rents this (house/apartment/mobile home).	2. (Show Card A.) Which of these categories best describes how each person is related to (Read name of Person 1)?	3. What is each person's sex? Mark <input checked="" type="checkbox"/> ONE box.
<p>Person 1</p> <p>First Name MI <input type="text"/></p> <p>Last Name <input type="text"/></p> <p><input type="checkbox"/> Cancel <input type="checkbox"/> Add</p>	<p><input checked="" type="checkbox"/> Person 1</p>	<p><input type="checkbox"/> Male</p> <p><input type="checkbox"/> Female</p>
<p>Person 2</p> <p>First Name MI <input type="text"/></p> <p>Last Name <input type="text"/></p> <p><input type="checkbox"/> Cancel <input type="checkbox"/> Add</p>	<p> <input type="checkbox"/> Husband/wife <input type="checkbox"/> Father/mother <input type="checkbox"/> Natural-born son/daughter <input type="checkbox"/> Grandchild <input type="checkbox"/> Adopted son/daughter <input type="checkbox"/> Parent-in-law <input type="checkbox"/> Stepson/stepdaughter <input type="checkbox"/> Son-in-law/daughter-in-law <input type="checkbox"/> Brother/sister <input type="checkbox"/> Other relative – Specify relationship. <input type="text"/> </p> <p>NONRELATIVE: <input type="checkbox"/> Roomer/boarder <input type="checkbox"/> Unmarried partner <input type="checkbox"/> Other nonrelative <input type="checkbox"/> Housemate/roommate <input type="checkbox"/> Foster child </p>	<p><input type="checkbox"/> Male</p> <p><input type="checkbox"/> Female</p>
<p>Person 3</p> <p>First Name MI <input type="text"/></p> <p>Last Name <input type="text"/></p> <p><input type="checkbox"/> Cancel <input type="checkbox"/> Add</p>	<p> <input type="checkbox"/> Husband/wife <input type="checkbox"/> Father/mother <input type="checkbox"/> Natural-born son/daughter <input type="checkbox"/> Grandchild <input type="checkbox"/> Adopted son/daughter <input type="checkbox"/> Parent-in-law <input type="checkbox"/> Stepson/stepdaughter <input type="checkbox"/> Son-in-law/daughter-in-law <input type="checkbox"/> Brother/sister <input type="checkbox"/> Other relative – Specify relationship. <input type="text"/> </p> <p>NONRELATIVE: <input type="checkbox"/> Roomer/boarder <input type="checkbox"/> Unmarried partner <input type="checkbox"/> Other nonrelative <input type="checkbox"/> Housemate/roommate <input type="checkbox"/> Foster child </p>	<p><input type="checkbox"/> Male</p> <p><input type="checkbox"/> Female</p>
<p>Person 4</p> <p>First Name MI <input type="text"/></p> <p>Last Name <input type="text"/></p> <p><input type="checkbox"/> Cancel <input type="checkbox"/> Add</p>	<p> <input type="checkbox"/> Husband/wife <input type="checkbox"/> Father/mother <input type="checkbox"/> Natural-born son/daughter <input type="checkbox"/> Grandchild <input type="checkbox"/> Adopted son/daughter <input type="checkbox"/> Parent-in-law <input type="checkbox"/> Stepson/stepdaughter <input type="checkbox"/> Son-in-law/daughter-in-law <input type="checkbox"/> Brother/sister <input type="checkbox"/> Other relative – Specify relationship. <input type="text"/> </p> <p>NONRELATIVE: <input type="checkbox"/> Roomer/boarder <input type="checkbox"/> Unmarried partner <input type="checkbox"/> Other nonrelative <input type="checkbox"/> Housemate/roommate <input type="checkbox"/> Foster child </p>	<p><input type="checkbox"/> Male</p> <p><input type="checkbox"/> Female</p>
<p>Person 5</p> <p>First Name MI <input type="text"/></p> <p>Last Name <input type="text"/></p> <p><input type="checkbox"/> Cancel <input type="checkbox"/> Add</p>	<p> <input type="checkbox"/> Husband/wife <input type="checkbox"/> Father/mother <input type="checkbox"/> Natural-born son/daughter <input type="checkbox"/> Grandchild <input type="checkbox"/> Adopted son/daughter <input type="checkbox"/> Parent-in-law <input type="checkbox"/> Stepson/stepdaughter <input type="checkbox"/> Son-in-law/daughter-in-law <input type="checkbox"/> Brother/sister <input type="checkbox"/> Other relative – Specify relationship. <input type="text"/> </p> <p>NONRELATIVE: <input type="checkbox"/> Roomer/boarder <input type="checkbox"/> Unmarried partner <input type="checkbox"/> Other nonrelative <input type="checkbox"/> Housemate/roommate <input type="checkbox"/> Foster child </p>	<p><input type="checkbox"/> Male</p> <p><input type="checkbox"/> Female</p>

2 ENUMERATOR NOTE: Refer to S5 on the cover. If the number of people is more than 5, add additional household members to Form D-2(E)SUPP, Continuation Form.

FORM D-2(E) (4-9-99)

ENUMERATOR NOTE: It is important to ask BOTH questions 5 and 6 and show Cards B and C.

4. What was each person's age on April 1?

Print numbers in boxes.

Age

What is this person's date of birth?

Month

Day

Year of birth

5. Are any of the persons that I have listed Mexican, Puerto Rican, Cuban, or of another Hispanic or Latino group?

- No, not Spanish/Hispanic/Latino
- Yes, Mexican, Mexican Am., Chicano
- Yes, Puerto Rican
- Yes, Cuban
- Yes, other Spanish/Hispanic/Latino - **What is this group?** ↘

6. Now choose one or more races for each person. Which race or races does each person consider himself/herself to be?

- White
- Black, African Am., or Negro
- Asian Indian
- Chinese
- American Indian or Alaska Native - **What is the name of (your/. . .'s) enrolled or principal tribe?** ↘
- Filipino
- Japanese
- Korean
- Vietnamese
- Other Asian
- Native Hawaiian
- Guamanian/Chamorro
- Samoan
- Other Pacific Islander
- Some other race

What is this race? ↘

Age

What is this person's date of birth?

Month

Day

Year of birth

- No, not Spanish/Hispanic/Latino
- Yes, Mexican, Mexican Am., Chicano
- Yes, Puerto Rican
- Yes, Cuban
- Yes, other Spanish/Hispanic/Latino - **What is this group?** ↘

- White
- Black, African Am., or Negro
- Asian Indian
- Chinese
- American Indian or Alaska Native - **What is the name of (your/. . .'s) enrolled or principal tribe?** ↘
- Filipino
- Japanese
- Korean
- Vietnamese
- Other Asian
- Native Hawaiian
- Guamanian/Chamorro
- Samoan
- Other Pacific Islander
- Some other race

What is this race? ↘

Age

What is this person's date of birth?

Month

Day

Year of birth

- No, not Spanish/Hispanic/Latino
- Yes, Mexican, Mexican Am., Chicano
- Yes, Puerto Rican
- Yes, Cuban
- Yes, other Spanish/Hispanic/Latino - **What is this group?** ↘

- White
- Black, African Am., or Negro
- Asian Indian
- Chinese
- American Indian or Alaska Native - **What is the name of (your/. . .'s) enrolled or principal tribe?** ↘
- Filipino
- Japanese
- Korean
- Vietnamese
- Other Asian
- Native Hawaiian
- Guamanian/Chamorro
- Samoan
- Other Pacific Islander
- Some other race

What is this race? ↘

Age

What is this person's date of birth?

Month

Day

Year of birth

- No, not Spanish/Hispanic/Latino
- Yes, Mexican, Mexican Am., Chicano
- Yes, Puerto Rican
- Yes, Cuban
- Yes, other Spanish/Hispanic/Latino - **What is this group?** ↘

- White
- Black, African Am., or Negro
- Asian Indian
- Chinese
- American Indian or Alaska Native - **What is the name of (your/. . .'s) enrolled or principal tribe?** ↘
- Filipino
- Japanese
- Korean
- Vietnamese
- Other Asian
- Native Hawaiian
- Guamanian/Chamorro
- Samoan
- Other Pacific Islander
- Some other race

What is this race? ↘

Age

What is this person's date of birth?

Month

Day

Year of birth

- No, not Spanish/Hispanic/Latino
- Yes, Mexican, Mexican Am., Chicano
- Yes, Puerto Rican
- Yes, Cuban
- Yes, other Spanish/Hispanic/Latino - **What is this group?** ↘

- White
- Black, African Am., or Negro
- Asian Indian
- Chinese
- American Indian or Alaska Native - **What is the name of (your/. . .'s) enrolled or principal tribe?** ↘
- Filipino
- Japanese
- Korean
- Vietnamese
- Other Asian
- Native Hawaiian
- Guamanian/Chamorro
- Samoan
- Other Pacific Islander
- Some other race

What is this race? ↘



COVERAGE

- C1.** I need to make sure I have counted everyone who lived or stayed here on April 1, 2000. Did I miss —
 – any children, including foster children?
 – anyone away on business or vacation?
 – any roomers or housemates?
 – anyone else who had no other home?
- Yes – Add person(s) to question 1 and mark the "Add" box. Ask questions 2–6 for each person and correct the POP count in question S5 on the front cover.
- No – Continue with C2.
- C2.** The Census Bureau has already counted certain people so I don't want to count them again here. On April 1, 2000, were any of the people you told me about —
 – away at college?
 – away in the Armed Forces?
 – in a nursing home?
 – in a correctional facility?
- Yes – Delete person(s) from 1 by marking the "Cancel" box. Correct the POP count in question S5 on the front cover.
- No – Continue with question 7.

Person 1

7. Print the name of Person 1 from page 2.

First Name MI

Last Name

8. What is (your/. . .'s) marital status?

- Now married
 Widowed
 Divorced
 Separated
 Never married

9a. At any time since February 1, 2000, (have you attended/has . . . attended) regular school or college? Include only nursery school or preschool, kindergarten, elementary school, and schooling which leads to a high school diploma or a college degree.

- If "Yes," ASK – Was it public or private?
- No, has not attended since February 1 → Skip to 10
 Yes, public school or public college
 Yes, private school or private college

9b. What grade or level (were you/was . . .) attending?

- Mark ONE box.
- Nursery school, preschool
 Kindergarten
 Grade 1 to grade 4
 Grade 5 to grade 8
 Grade 9 to grade 12
 College undergraduate years (freshman to senior)
 Graduate or professional school (for example: medical, dental, or law school)

- 10.** (Show Card D.) What is the highest degree or level of school (you have/. . . has) COMPLETED? Mark ONE box. If currently enrolled, mark the previous grade or highest degree received.
- No schooling completed
 Nursery school to 4th grade
 5th grade or 6th grade
 7th grade or 8th grade
 9th grade
 10th grade
 11th grade
 12th grade – NO DIPLOMA
 HIGH SCHOOL GRADUATE – high school DIPLOMA or the equivalent (for example: GED)
 Some college credit, but less than 1 year
 1 or more years of college, no degree
 Associate degree (for example: AA, AS)
 Bachelor's degree (for example: BA, AB, BS)
 Master's degree (for example: MA, MS, MEng, MEd, MSW, MBA)
 Professional degree (for example: MD, DDS, DVM, LLB, JD)
 Doctorate degree (for example: PhD, EdD)

11. What is (your/. . .'s) ancestry or ethnic origin?

(For example: Italian, Jamaican, African Am., Cambodian, Cape Verdean, Norwegian, Dominican, French Canadian, Haitian, Korean, Lebanese, Polish, Nigerian, Mexican, Taiwanese, Ukrainian, and so on.)

12a. (Do you/Does . . .) speak a language other than English at home?

- Yes
 No → Skip to 13

12b. What is that language?

(For example: Korean, Italian, Spanish, Vietnamese)

12c. How well (do you/does . . .) speak English?

- Very well
 Well
 Not well
 Not at all

Person 1 (continued)

13. Where (were you/was . . .) born?

In the United States – *Print name of state.*

Outside the United States – *Print name of foreign country, or Puerto Rico, Guam, etc.*

14. (Are you/Is . . .) a CITIZEN of the United States?

- Yes, born in the United States → *Skip to 16a*
- Yes, born in Puerto Rico, Guam, the U.S. Virgin Islands, or Northern Marianas
- Yes, born abroad of American parent or parents
- Yes, U.S. citizen by naturalization
- No, not a citizen of the United States

15. What year did (you/. . .) come to live in the United States?

Year

16a. Did (you/. . .) live in this (house/apartment) 5 years ago (on April 1, 1995)?

- Person is under 5 years old → *Skip to 34*
- Yes, this house → *Skip to 17*
- No, outside the United States – *Print name of foreign country, or Puerto Rico, Guam, etc. below; then skip to 17.*

No, different house in the United States

16b. Where did (you/. . .) live 5 years ago?

Name of city, town, or post office?

Did (you/. . .) live inside the limits of that city or town?

Yes No, outside the city/town limits

Name of county?

Name of state?

What was the ZIP Code?

17. (Do you/Does . . .) have any of the following long-lasting conditions:

17a. Blindness, deafness, or a severe vision or hearing impairment?

Yes No

17b. A condition that substantially limits one or more basic physical activities such as walking, climbing stairs, reaching, lifting, or carrying?

Yes No

18. Because of a physical, mental, or emotional condition lasting 6 months or more, (do you/does . . .) have any difficulty in doing any of the following activities:

18a. Learning, remembering, or concentrating?

Yes No

18b. Dressing, bathing, or getting around inside the home?

Yes No

18c. ASK if this person is 16 YEARS OLD OR OVER. Going outside the home alone to shop or visit a doctor's office?

Yes No

18d. ASK if this person is 16 YEARS OLD OR OVER. Working at a job or business?

Yes No

19. INTERVIEWER INSTRUCTION – Refer to question 4 on page 3 to mark a response box below.

Born on or before April 1, 1985 or at least age 15 by April 1, 2000 – *Ask 20a*

Born after April 1, 1985 → *Skip to 34*

If question 4 is blank, ASK – (Were you/Was . . .) under 15 years of age on April 1, 2000?

Yes → *Skip to 34* No – *Ask 20a*

20a. (Do you/Does . . .) have any of (your/his/her) own grandchildren under the age of 18 living in this (house/apartment)?

Yes No → *Skip to 21a*

20b. (Are you/Is . . .) currently responsible for most of the basic needs of any grandchild(ren) under the age of 18 who live(s) in this (house/apartment)?

Yes No → *Skip to 21a*

20c. How long (have you/has . . .) been responsible for the(se) grandchild(ren)? If more than one grandchild lives with (you/. . .), answer the question for the grandchild for whom (you have/. . . has) been financially responsible for the longest period of time.

- Less than 6 months
- 6 to 11 months
- 1 or 2 years
- 3 or 4 years
- 5 years or more



Person 1 (continued)

- 21a.** (Have you/Has . . .) ever served on active duty in the U.S. Armed Forces, military Reserves, or National Guard? Active duty does not include training for the Reserves or National Guard, but DOES include activation, for example, for the Persian Gulf War.
- Yes, now on active duty
 - Yes, on active duty in past, but not now
 - No, training for Reserves or National Guard only
 - No, never served in the military } *Skip to 22*

- 21b.** (Show Card E.) When did (you/. . .) serve on active duty in the U.S. Armed Forces? Mark a box for EACH period served.
- After each response ASK – Any other time?
- April 1995 or later
 - August 1990 to March 1995 (including Persian Gulf War)
 - September 1980 to July 1990
 - May 1975 to August 1980
 - Vietnam era (August 1964 to April 1975)
 - February 1955 to July 1964
 - Korean conflict (June 1950 to January 1955)
 - World War II (September 1940 to July 1947)
 - Some other time

- 21c.** In total, how many years of active-duty military service (have you/has . . .) had?
- Less than 2 years
 - 2 years or more

- 22.** LAST WEEK, did (you/. . .) do ANY work for either pay or profit? Answer "Yes" even if (you/. . .) worked only 1 hour, or helped without pay in a family business or farm for 15 hours or more, or (were/was) on active duty in the Armed Forces.
- Yes
 - No → *Skip to 26a*

- 23.** At what location did (you/. . .) work LAST WEEK? If the person worked at more than one location, print where (he/she) worked most last week.

- 23a.** Number and street name?
- _____
- _____
- If the exact address is not known, ask for a description of the location such as the building name or the nearest street or intersection.

- 23b.** Name of city, town, or post office?
- _____

- 23c.** Is the work location inside the limits of that city or town?
- Yes
 - No, outside the city/town limits

- 23d.** Name of county?
- _____

- 23e.** Name of U.S. state or foreign country?
- _____

- 23f.** What was the ZIP Code?
- _____

- 24a.** How did (you/. . .) usually get to work LAST WEEK? If the person usually used more than one method of transportation during the trip, mark the one used for most of the distance.
- Car, truck, or van – Continue with 24b
 - Bus or trolley bus
 - Streetcar or trolley car . . .
 - Subway or elevated
 - Railroad
 - Ferryboat
 - Taxicab
 - Motorcycle
 - Bicycle
 - Walked
 - Worked at home → *Skip to 28*
 - Other method → *Skip to 25a*

- 24b.** How many people, including (yourself/. . .), usually rode to work in the car, truck, or van LAST WEEK?
- Drove alone
 - 2 people
 - 3 people
 - 4 people
 - 5 or 6 people
 - 7 or more people

- 25a.** What time did (you/. . .) usually leave home to go to work LAST WEEK?
- _____ : _____
- a.m.
 - p.m.

- 25b.** How many minutes did it usually take (you/. . .) to get from home to work LAST WEEK?
- Minutes
- _____ → *Skip to 28*

- 26a.** LAST WEEK, (were you/was . . .) on layoff from a job?
- Yes → *Skip to 26c*
 - No

- 26b.** LAST WEEK, (were you/was . . .) TEMPORARILY absent or on vacation from a job or business?
- Yes, on vacation, temporary illness, labor dispute, etc. → *Skip to 27*
 - No → *Skip to 26d*

Person 1 (continued)

32. The next set of questions is about each income source received during 1999 by (you/. . .). If the net income was a loss, please give the dollar amount of the loss. For income received jointly, report, if possible, the appropriate share for each person; otherwise, report the whole amount for only one person (and mark the "No" box for the other person). If exact amount is not known, please give best estimate. If net income is a loss, mark the "Loss" box next to the dollar amount.

32a. Did (you/. . .) receive any wages, salary, commissions, bonuses or tips in 1999?
 Yes - What was the amount from all jobs before deductions for taxes, bonds, dues, or other items?
 Annual amount - Dollars
 \$ | | | , | | | .00

No

32b. Did (you/. . .) have any self-employment income from own nonfarm businesses or farm businesses, including proprietorships and partnerships in 1999?
 Yes - What was the net income after business expenses?
 Annual amount - Dollars

\$ | | | , | | | .00 Loss

No

32c. Did (you/. . .) receive any interest, dividends, net rental income, royalty income, or income from estates and trusts in 1999? Report even small amounts credited to an account.

Yes - What was the amount?
 Annual amount - Dollars
 \$ | | | , | | | .00 Loss

No

32d. Did (you/. . .) receive any Social Security or Railroad Retirement income in 1999?

Yes - What was the amount?
 Annual amount - Dollars
 \$ | | , | | | .00

No

32e. Did (you/. . .) receive any Supplemental Security Income (SSI) in 1999?

Yes - What was the amount?
 Annual amount - Dollars
 \$ | | , | | | .00

No

32f. Did (you/. . .) receive any public assistance or welfare payments from the state or local welfare office in 1999?

Yes - What was the amount?
 Annual amount - Dollars
 \$ | | , | | | .00

No

32g. Did (you/. . .) receive retirement, survivor, or disability pensions in 1999? Do NOT include Social Security.

Yes - What was the amount?
 Annual amount - Dollars
 \$ | | | , | | | .00

No

32h. Did (you/. . .) have any other sources of income received regularly such as Veterans' (VA) payments, unemployment compensation, child support, or alimony in 1999? Do not include lump-sum payments such as money from an inheritance or sale of a home.

Yes - What was the amount?
 Annual amount - Dollars
 \$ | | | , | | | .00

No

33. Do not ask this question if 32a-32h are completed. Instead sum these entries and subtract any losses. Enter the amount below. If total amount was a loss, mark the "Loss" box next to the amount.

What was (your/. . .'s) total income in 1999?
 Annual amount - Dollars
 None OR \$ | | | , | | | .00 Loss

The next set of questions is about your household.

34. Is this (house/apartment/mobile home) -
 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, or
 Occupied without payment of cash rent?

35. (Show Card G.) Which of these categories best describes this building? Include all apartments, flats, etc., even if vacant.

- A mobile home
- A one-family house detached from any other house
- A one-family house attached to one or more houses
- A building with 2 apartments
- A building with 3 or 4 apartments
- A building with 5 to 9 apartments
- A building with 10 to 19 apartments
- A building with 20 to 49 apartments
- A building with 50 or more apartments
- Boat, RV, van, etc.

36. About when was this building first built?

- 1999 or 2000
- 1995 to 1998
- 1990 to 1994
- 1980 to 1989
- 1960 to 1969
- 1950 to 1959
- 1940 to 1949
- 1939 or earlier
- 1970 to 1979

Person 1 (continued)

37. When did (Read Person 1's name) move into this (house/apartment/mobile home)?

- 1999 or 2000 1980 to 1989
- 1995 to 1998 1970 to 1979
- 1990 to 1994 1969 or earlier

38. How many rooms do you have in this (house/apartment/mobile home)? Do NOT count bathrooms, porches, balconies, foyers, halls, or half-rooms.

Rooms

39. How many bedrooms do you have; that is, how many would you list if this (house/apartment/mobile home) were on the market for sale or rent?

- None 3 bedrooms
- 1 bedroom 4 bedrooms
- 2 bedrooms 5 or more bedrooms

40. Do you have COMPLETE plumbing facilities in this (house/apartment/mobile home); that is, 1) hot and cold piped water, 2) a flush toilet, and 3) a bathtub or shower?

- Yes, have all three facilities
- No

41. Do you have COMPLETE kitchen facilities in this (house/apartment/mobile home); that is, 1) a sink with piped water, 2) a range or stove, and 3) a refrigerator?

- Yes, have all three facilities
- No

42. Is there telephone service available in this (house/apartment/mobile home) from which you can both make and receive calls?

- Yes
- No

43. (Show Card H.) Which FUEL is used MOST for heating this (house/apartment/mobile home)?

- Gas: from underground pipes serving the neighborhood
- Gas: bottled, tank, or LP
- Electricity
- Fuel oil, kerosene, etc.
- Coal or coke
- Wood
- Solar energy
- Other fuel
- No fuel used

44. How many automobiles, vans, and trucks of one-ton capacity or less are kept at home for use by members of your household?

Vehicles

45. REFER TO 35. Ask 45a, 45b, and 45c ONLY if this is a ONE-FAMILY HOUSE OR MOBILE HOME. All others skip to 46.

45a. Is there a business (such as a store or barber shop) or a medical office on this property?

- Yes
- No

45b. How many acres is this (house/mobile home) on?

- Less than 1 acre → Skip to 46
- 1 to 9.9 acres
- 10 or more acres

45c. In 1999, what were the actual sales of all agricultural products from this property?

- None
- \$1 to \$999
- \$1,000 to \$2,499
- \$2,500 to \$4,999
- \$5,000 to \$9,999
- \$10,000 or more

46. What is the annual cost for – If respondent has lived here less than 1 year, ask him/her to estimate the annual cost.

46a. Electricity?

Annual cost – Dollars

OR

- Included in rent or in condominium fee
- No charge or electricity not used

46b. Gas?

Annual cost – Dollars

OR

- Included in rent or in condominium fee
- No charge or gas not used

46c. Water and sewer?

Annual cost – Dollars

OR

- Included in rent or in condominium fee
- No charge

46d. Oil, coal, kerosene, wood, etc.?

Annual cost – Dollars

OR

- Included in rent or in condominium fee
- No charge or these fuels not used



Person 1 (continued)

47. REFER TO 34. Ask 47a and 47b ONLY if RENT is paid for this (house/apartment/mobile home) – All others skip to 48.

47a. What is the monthly rent?

Monthly amount – Dollars

\$ | | , | | .00

47b. Does the monthly rent include any meals?

- Yes
- No

48. REFER TO 34. Ask questions 48 to 58b if someone in the household OWNS or IS BUYING this house, apartment, or mobile home; otherwise, skip to questions for Person 2.

Do you have a mortgage, deed of trust, contract to purchase, or similar debt on THIS property?

- Yes, mortgage, deed of trust, or similar debt
- Yes, contract to purchase
- No → Skip to 52

49. How much is your regular monthly mortgage payment on THIS property? Include payment only on first mortgage or contract to purchase.

Monthly amount – Dollars

\$ | | , | | .00

OR

- No regular payment required → Skip to 52

50. Does your regular monthly mortgage payment include payments for real estate taxes on THIS property?

- Yes, taxes included in mortgage payment
- No, taxes paid separately or taxes not required

51. Does your regular monthly mortgage payment include payments for fire, hazard, or flood insurance on THIS property?

- Yes, insurance included in mortgage payment
- No, insurance paid separately or no insurance

52. Do you have a second mortgage or a home equity loan on THIS property? Mark all boxes that apply.

If "Yes," ASK – Which ones?

- Yes, a second mortgage
- Yes, a home equity loan
- No → Skip to 54

53. How much is your regular monthly payment on all second or junior mortgages and all home equity loans on THIS property?

Monthly amount – Dollars

\$ | | , | | .00

OR

- No regular payment required

54. What were the real estate taxes on THIS property last year?

Yearly amount – Dollars

\$ | | , | | .00

OR

- None

55. What was the annual payment for fire, hazard, and flood insurance on THIS property?

Annual cost – Dollars

\$ | | , | | .00

OR

- None

56. (Show Card I.) What is the value of this property; that is, how much do you think this (house and lot/apartment/mobile home and lot) would sell for if it were for sale?

- | | |
|---|---|
| <input type="checkbox"/> Less than \$10,000 | <input type="checkbox"/> \$90,000 to \$99,999 |
| <input type="checkbox"/> \$10,000 to \$14,999 | <input type="checkbox"/> \$100,000 to \$124,999 |
| <input type="checkbox"/> \$15,000 to \$19,999 | <input type="checkbox"/> \$125,000 to \$149,999 |
| <input type="checkbox"/> \$20,000 to \$24,999 | <input type="checkbox"/> \$150,000 to \$174,999 |
| <input type="checkbox"/> \$25,000 to \$29,999 | <input type="checkbox"/> \$175,000 to \$199,999 |
| <input type="checkbox"/> \$30,000 to \$34,999 | <input type="checkbox"/> \$200,000 to \$249,999 |
| <input type="checkbox"/> \$35,000 to \$39,999 | <input type="checkbox"/> \$250,000 to \$299,999 |
| <input type="checkbox"/> \$40,000 to \$49,999 | <input type="checkbox"/> \$300,000 to \$399,999 |
| <input type="checkbox"/> \$50,000 to \$59,999 | <input type="checkbox"/> \$400,000 to \$499,999 |
| <input type="checkbox"/> \$60,000 to \$69,999 | <input type="checkbox"/> \$500,000 to \$749,999 |
| <input type="checkbox"/> \$70,000 to \$79,999 | <input type="checkbox"/> \$750,000 to \$999,999 |
| <input type="checkbox"/> \$80,000 to \$89,999 | <input type="checkbox"/> \$1,000,000 or more |

57a. Is this (house/apartment/mobile home) part of a condominium?

- Yes
- No → Skip to 58

57b. What is the monthly condominium fee?

Monthly amount – Dollars

\$ | | , | | .00

58. REFER TO 35. Ask 58a and 58b ONLY if this is a MOBILE HOME –

58a. Do you have an installment loan or contract on THIS mobile home?

- Yes
- No

58b. What was the total cost for installment loan payments, personal property taxes, site rent, registration fees, and license fees on THIS mobile home and its site last year? Exclude real estate taxes.

Yearly amount – Dollars

\$ | | , | | .00

59. Refer to S5 on the front cover. If the number of people is more than one, continue on the next page. If not, skip to the "Respondent Information" block on page 31.

Person 2

7. Print the name of Person 2 from page 2.

First Name MI

Last Name

8. What is (your/. . . 's) marital status?

- Now married Separated
 Widowed Never married
 Divorced

9a. At any time since February 1, 2000, (have you attended/has . . . attended) regular school or college? Include only nursery school or preschool, kindergarten, elementary school, and schooling which leads to a high school diploma or a college degree.

If "Yes," ASK – Was it public or private?

- No, has not attended since February 1 → Skip to 10
 Yes, public school or public college
 Yes, private school or private college

9b. What grade or level (were you/was . . .) attending?

Mark ONE box.

- Nursery school, preschool
 Kindergarten
 Grade 1 to grade 4
 Grade 5 to grade 8
 Grade 9 to grade 12
 College undergraduate years (freshman to senior)
 Graduate or professional school (for example: medical, dental, or law school)

10. (Show Card D.) What is the highest degree or level of school (you have/. . . has) COMPLETED? Mark ONE box. If currently enrolled, mark the previous grade or highest degree received.

- No schooling completed
 Nursery school to 4th grade
 5th grade or 6th grade
 7th grade or 8th grade
 9th grade
 10th grade
 11th grade
 12th grade – NO DIPLOMA
 HIGH SCHOOL GRADUATE – high school DIPLOMA or the equivalent (for example: GED)
 Some college credit, but less than 1 year
 1 or more years of college, no degree
 Associate degree (for example: AA, AS)
 Bachelor's degree (for example: BA, AB, BS)
 Master's degree (for example: MA, MS, MEng, MEd, MSW, MBA)
 Professional degree (for example: MD, DDS, DVM, LLB, JD)
 Doctorate degree (for example: PhD, EdD)

11. What is (your/. . . 's) ancestry or ethnic origin?

(For example: Italian, Jamaican, African Am., Cambodian, Cape Verdean, Norwegian, Dominican, French Canadian, Haitian, Korean, Lebanese, Polish, Nigerian, Mexican, Taiwanese, Ukrainian, and so on.)

12a. (Do you/Does . . .) speak a language other than English at home?

- Yes
 No → Skip to 13

12b. What is that language?

(For example: Korean, Italian, Spanish, Vietnamese)

12c. How well (do you/does . . .) speak English?

- Very well
 Well
 Not well
 Not at all

13. Where (were you/was . . .) born?

- In the United States – Print name of state.

- Outside the United States – Print name of foreign country, or Puerto Rico, Guam, etc.

14. (Are you/Is . . .) a CITIZEN of the United States?

- Yes, born in the United States → Skip to 16a
 Yes, born in Puerto Rico, Guam, the U.S. Virgin Islands, or Northern Marianas
 Yes, born abroad of American parent or parents
 Yes, U.S. citizen by naturalization
 No, not a citizen of the United States

15. What year did (you/. . .) come to live in the United States?

Year



HOUSING

H1. *If address label includes a Map Spot number, ask* — **What is the mailing address of this unit?**

House number

Street name, Rural route and box, or PO box

Apartment number

City

State

ZIP Code

RESPONDENT INFORMATION

R1. *Enter respondent's name.*

First Name

Last Name

R2. *In case we need to contact you, what is your telephone number and the best time to call?*

Area code

Telephone number

Day

Evening

Either

R3. Respondent –

Lived here on April 1, 2000

Moved in after April 1, 2000
(Refer to Card K)

Is neighbor or other

INTERVIEW SUMMARY

A. Status on April 1, 2000

1 = Occupied
2 = Occupied – Continuation
3 = Vacant – Regular
4 = Vacant – Usual home elsewhere
5 = Demolished/Burned out
6 = Cannot locate
7 = Duplicate
8 = Nonresidential
9 = Other (open to elements, condemned, under construction)

B. POP on April 1, 2000

01–97 = Total persons
00 = Vacant
98 = Delete
99 = POP unknown

C. VACANT – Which category best described this vacant unit as of April 1, 2000?

For rent

For sale only

Rented or sold, not occupied

For seasonal, recreational, or occasional use

For migrant workers

Other vacant

D. SP

E. UHE

F. MOV

G. PI

H. REF

I. REP

J. CO

K. TC

L. JIC1

M. JIC2

N. JIC3

O. JIC4



Appendix B

COMPUTATION OF RESPONSE VARIANCE MEASURES AND THEIR 90-PERCENT CONFIDENCE INTERVALS

This appendix presents the computational forms of the response variance measures used in this report, along with numerical examples. It also presents weights and weighted cross-tabulations.

We start with three cross-tabulations, one in general form and two for the numerical examples used throughout this appendix. We follow with section B.1 for the measures, section B.2 for confidence intervals for the measures, and section B.3 for weights and weighted cross-tabulations.

Table B.1 Display of cross-tabulated data - General procedure

[Display of cross-tabulated data for characteristic with L categories ($L \geq 2$). The general term X_{ij} represents the number of weighted or unweighted sample elements in the i^{th} category in the reinterview and the j^{th} category in the census.]

Reinterview classification	Census classification								
	Total	Not reported	Reported	1	2	...	i	...	L
Total	$n'_{..1}$								
Not reported ²									
Reported			$n_{..}$ ³	$X_{.1}$	$X_{.2}$	...	$X_{.i}$	...	$X_{.L}$
Item responses:									
1. Category 1			$X_{1.}$	X_{11}	X_{12}	...	X_{1i}	...	X_{1L}
2. Category 2			$X_{2.}$	X_{21}	X_{22}	...	X_{2i}	...	X_{2L}
.		
.		
.		
i. Category i			$X_{i.}$	X_{i1}	X_{i2}	...	X_{ii}	...	X_{iL}
.		
.		
.		
L. Category L			$X_{L.}$	X_{L1}	X_{L2}	...	X_{Li}	...	X_{LL}

¹ $n'_{..}$ is the total number of sample cases. In the actual data tables, row 1 and column 1 contain the appropriate marginal totals.

² In the actual data tables, row 2 and column 2 contain the numbers of cases for which there was no report for that item in either the census or the reinterview.

³ $n_{..}$ is the total number of sample cases for which there was a report in both the census and the reinterview. That is, $n_{..}$ is the of the sample cases minus the "not reported" cases.

Table B.2 Example of procedure: Tenure (Unedited data; 2000)

Reinterview classification	Census classification						
	Total	Not reported	Reported	1	2	3	4
Total	19897	1454	18443	9143	4514	4364	422
Not reported	31	8	23	9	7	5	2
Reported	19866	1446	18420	9134	4507	4359	420
Item response:							
1. Loan	9861	634	9227	8226	882	90	29
2. Owned ... free and clear	4720	364	4356	752	3498	32	74
3. Rented for cash rent	4872	418	4454	120	56	4192	86
4. Cash rent	413	30	383	36	71	45	231

Table B.3 Example of procedure: Marital status (Unedited data; 2000)*

Reinterview classification	Census classification					
	Reported	1	2	3	4	5
Reported	18409.5500	8842.6900	1067.4100	1369.3800	268.2150	6861.8500
1. Now married	8827.2100	8654.2000	10.4500	39.0910	32.8980	90.5670
2. Widowed	1080.9600	16.6430	1017.1000	32.5110	3.0963	11.6110
3. Divorced	1315.9700	33.2850	20.5130	1192.5000	35.9950	33.6720
4. Separated	250.7990	37.9300	5.4186	29.0280	169.5200	8.9019
5. Never married	6934.6200	100.6300	13.9330	76.2470	26.7060	6717.1000

* The tables for population characteristics in the appendix have entries rounded to the nearest integer.

B.1 Computing the net difference rate, gross difference rate, and index of inconsistency.

B.1.1 Net difference rate (NDR)

For category I

$$NDR = \frac{X_j - X_i}{n} \times 100$$

For tenure category “2. Owned..free and clear”

$$NDR = \frac{4507 - 4356}{18420} \times 100 \approx 0.8$$

For marital status category “4. Separated”

$$NDR = \frac{268.2150 - 250.7990}{18409.5500} \times 100 \approx 0.1$$

B.1.2 Gross difference rate (GDR)

For category I

$$\text{GDR} = \frac{X_{.i} + X_{i.} - 2X_{ii}}{n..} \times 100$$

For tenure category “2. Owned..free and clear”

$$\text{GDR} = \frac{4507 + 4356 - 2(3498)}{18420} \times 100 \approx 10.1$$

For marital status category “4. Separated”

$$\text{GDR} = \frac{268.2150 + 250.7990 - 2(169.5200)}{18409.5500} \times 100 \approx 1.0$$

B.1.3 Aggregate gross difference rate (GDR_A)

General Formula

$$\text{GDR}_A = \frac{n.. - \sum_{i=1}^L X_{ii}}{n..} \times 100$$

For tenure

$$\begin{aligned} \text{GDR}_A &= \frac{18420 - (8226 + 3498 + 4192 + 231)}{18420} \times 100 \\ &= \frac{18420 - 16147}{18420} \times 100 \approx 12.3 \end{aligned}$$

For marital status

$$\begin{aligned} \text{GDR}_A &= \frac{18409.5500 - (8654.2000 + 1017.1000 + 1192.5000 + 169.5200 + 6717.1000)}{18409.5500} \times 100 \\ &= \frac{18409.5500 - 17750.4200}{18409.5500} \times 100 \approx 3.6 \end{aligned}$$

B.1.4 Index of inconsistency

For category I

$$I = \frac{X_{.i} + X_{i.} - 2X_{ii}}{\frac{1}{n_{..}}[X_{.i}(n_{..} - X_{i.}) + X_{i.}(n_{..} - X_{.i})]} \times 100$$

For tenure category “2. Owned..free and clear”

$$\begin{aligned} I &= \frac{4507 + 4356 - 2(3498)}{\frac{1}{18420}[4507(18420 - 4356) + 4356(18420 - 4507)]} \times 100 \\ &= \frac{8863 - 6996}{\frac{1}{18420}[4507(14064) + 4356(13913)]} \times 100 \approx 27.7 \end{aligned}$$

For marital status category “4. Separated”

$$\begin{aligned} I &= \frac{268.2150 + 250.7990 - 2(169.5200)}{\frac{1}{18409.5500}[268.2150(18409.5500 - 250.7990) + 250.7990(18409.550 - 268.2150)]} \times 100 \\ &= \frac{519.0140 - 339.0400}{\frac{1}{18409.5500}[268.2150(18158.7510) + 250.7990(18141.3350)]} \times 100 \approx 35.2 \end{aligned}$$

B.1.5 Aggregate index of inconsistency (I_A)

General formula

$$I_A = \frac{n_{..} - \sum_{i=1}^L X_{ii}}{n_{..} - \sum_{i=1}^L X_{.i} X_{i.}} \times 100$$

For tenure

$$I_A = \frac{18420 - (8226 + 3498 + 4192 + 231)}{18420 - \frac{1}{18420} [9134(9227) + 4507(4356) + 4359(4454) + 420(383)]} \times 100$$

$$= \frac{18420 - 16147}{18420 - \frac{1}{18420} (123487756)} \times 100 \approx 19.4$$

For marital status

$$I_A = \frac{18409.5500 - (8654.2000 + 1017.1000 + 1192.5000 + 169.5200 + 6717.1000)}{18409.5500 - \frac{1}{18409.5500} [8842.6900(8827.2100) + 1067.4100(1080.9600) + 1369.3800(1315.9700) + 268.2150(250.7990) + 6861.8500(6934.6700)]} \times 100$$

$$= \frac{18409.5500 - 17750.4200}{18409.5500 - \frac{1}{18409.5500} (128663732.4080)} \times 100 \approx 5.8$$

B.2 Computing 90-percent confidence intervals

This section shows formulas for the lower confidence limit (LCL) and upper confidence limit (UCL) for the confidence intervals for the NDR, GDRs, and indexes of inconsistency. Computational examples follow the general formulas for each measure. For 90-percent confidence intervals, $Z=1.645$.

B.2.1 90-percent confidence interval for net difference rate

For category I

If ...

Then the confidence limits for the NDR are...

$$X_i \neq X_{ii} \text{ and } X_i \neq X_{ii}$$

$$LCL = \frac{1}{n..} [(X_i - X_{ii}) - \frac{Z}{2} \sqrt{Z^2 + 4(X_i + X_{ii} - 2X_{ii})}] \times 100$$

$$UCL = \frac{1}{n..} [(X_i - X_{ii}) + \frac{Z}{2} \sqrt{Z^2 + 4(X_i + X_{ii} - 2X_{ii})}] \times 100$$

$$X_i \neq X_{ii} \text{ and } X_i = X_{ii}$$

$$LCL = \frac{1}{n..} [(X_i - X_{ii}) - \frac{Z}{2} \sqrt{Z^2 + 4(X_i + X_{ii} - 2X_{ii})}] \times 100$$

$$UCL = \frac{1}{n..} [(X_i - X_{ii} + \frac{Z^2}{2}) + \frac{Z}{2} \sqrt{Z^2 + 4(X_i + X_{ii} - 2X_{ii})}] \times 100$$

If ...

Then the confidence limits for the NDR are...

$$X_{.i} = X_{.ii} \text{ and } X_{.i} \neq X_{.ii}$$

$$\text{LCL} = \frac{1}{n..} \left[(X_{.i} - X_{.i}) - \frac{Z^2}{2} - \frac{Z}{2} \sqrt{Z^2 + 4(X_{.i} + X_{.i} - 2X_{.ii})} \right] \times 100$$

$$\text{UCL} = \frac{1}{n..} \left[(X_{.i} - X_{.i}) + \frac{Z^2}{2} + \frac{Z}{2} \sqrt{Z^2 + 4(X_{.i} + X_{.i} - 2X_{.ii})} \right] \times 100$$

$$X_{.i} = X_{.ii} \text{ and } X_{.i} = X_{.ii}$$

$$\text{LCL} = -\frac{Z^2}{n} \times 100$$

$$\text{UCL} = \frac{Z^2}{n} \times 100$$

For tenure category “2. Owned..free and clear”

$$X_{22} = 3498, X_{.2} = 4507, \text{ and } X_{2.} = 4356.$$

Since $X_{.2} \neq X_{22}$ and $X_{2.} \neq X_{22}$, the 90-percent confidence limits are

$$\frac{1}{18420} [(4507 - 4356) \pm \frac{1.645}{2} \sqrt{1.645^2 + 4(4507 + 4356 - 2(3498))}] \times 100:$$

$$\text{LCL} \approx 0.4 \text{ and } \text{UCL} \approx 1.2.$$

For marital status category “4. Separated”

$$X_{44} = 169.5200, X_{.4} = 268.2150, \text{ and } X_{4.} = 250.7990.$$

Since $X_{.4} \neq X_{44}$ and $X_{4.} \neq X_{44}$, the 90-percent confidence limits are

$$\frac{1}{18409.5500} \left[(268.2150 - 250.7990) \pm \frac{1.645}{2} \sqrt{1.645^2 + 4(268.2150 + 250.7990 - 2(169.5200))} \right] \times 100:$$

$$\text{LCL} \approx -0.0 \text{ and } \text{UCL} \approx 0.2$$

B.2.2 90-percent confidence interval for gross difference rate

For category I

If ...	Then the confidence limits for the GDR are...
$\frac{1}{n..}(X_{.i} + X_{i.} - 2X_{ii}) \leq 0.1$	$\frac{1}{n..} \left[(X_{.i} + X_{i.} - 2X_{ii} + \frac{Z^2}{2}) \pm \frac{Z}{2} \sqrt{Z^2 + 4(X_{.i} + X_{i.} - 2X_{ii})} \right] \times 100$
$\frac{1}{n..}(X_{.i} + X_{i.} - 2X_{ii}) > 0.1$	$\frac{1}{n..} \left[(X_{.i} + X_{i.} - 2X_{ii} + \frac{Z^2}{2}) \pm Z \sqrt{\frac{1}{n..}(X_{.i} + X_{i.} - 2X_{ii})(n.. - X_{.i} - X_{i.} + 2X_{ii})} \right] \times 100$

For tenure category “2. Owned..free and clear”

Since $\frac{1}{n..}(X_{.2} + X_{2.} - 2X_{22}) = \frac{1}{18420} [4507 + 4356 - 2(3498)] = 0.101 > 0.1$,

the 90-percent confidence limits are

$$\frac{1}{18420} \left[(4507 + 4356 - 2(3498) + \frac{1.645^2}{2}) \pm 1.645 \sqrt{\frac{1}{18420} (4507 + 4356 - 2(3498))(18420 - 4507 - 4356 + 2(3498))} \right] \times 100:$$

LCL \approx 9.8 and UCL \approx 10.5

For marital status category “4. Separated”

Since $\frac{1}{n..}(X_{.4} + X_{4.} - 2X_{44}) = \frac{1}{18409.5500} [268.2150 + 250.7990 - 2(169.5200)] \approx 0.01 < 0.1$,

the 90-percent confidence limits are

$$\frac{1}{18409.5500} \left[(268.2150 + 250.7990 - 2(169.5200) + \frac{1.645^2}{2}) \pm \frac{1.645}{2} \sqrt{1.645^2 + 4(268.2150 + 250.7990 - 2(169.5200))} \right] \times 100:$$

LCL \approx 0.9 and UCL \approx 1.1

B.2.3 90-percent confidence interval for aggregate gross difference rate

General formula

$$\left[\frac{n.. - \sum_{i=1}^L X_{ii}}{n..} \pm \frac{Z}{n.. \sqrt{n..}} \sqrt{\left(n.. - \sum_{i=1}^L X_{ii} \right) \left(\sum_{i=1}^L X_{ii} \right)} \right] \times 100$$

For tenure

$$\sum_{i=1}^4 X_{ii} = 8226 + 3498 + 4192 + 231 = 16147, \text{ so the confidence limits are}$$

$$\left[\frac{18420 - 16147}{18420} \pm \frac{1.645}{18420 \sqrt{18420}} \sqrt{(18420 - 16147)(16147)} \right] \times 100:$$

$$\text{LCL} \approx 11.9 \text{ and } \text{UCL} \approx 12.7.$$

For marital status

$$\sum_{i=1}^5 X_{ii} = 8654.2000 + 1017.1000 + 1192.5000 + 169.5200 + 6717.1000 = 17750.4200,$$

so the confidence limits are

$$\left[\frac{18409.5500 - 17750.4200}{18409.5500} \pm \frac{1.645}{18409.5500 \sqrt{18409.5500}} \sqrt{(18409.5500 - 17750.4200)(17750.4200)} \right] \times 100:$$

$$\text{LCL} \approx 3.4 \text{ and } \text{UCL} \approx 3.8.$$

B.2.4 90-percent confidence interval for index of inconsistency

For category I

If ...	Then the confidence limits for the index are...
$\frac{1}{n..} (X_i + X_i - 2X_{ii}) \leq 0.1$	$\frac{(X_i + X_i - 2X_{ii} + \frac{Z^2}{2}) \pm \frac{Z}{2} \sqrt{Z^2 + 4(X_i + X_i - 2X_{ii})}}{[X_i(n.. - X_i) + X_i(n.. - X_i)] / n..} \times 100$
$\frac{1}{n..} (X_i + X_i - 2X_{ii}) \geq 0.1$	$\frac{(X_i + X_i - 2X_{ii} + \frac{Z^2}{2}) \pm Z \sqrt{\frac{1}{n..} (X_i + X_i - 2X_{ii})(n.. - X_i - X_i + 2X_{ii})}}{[X_i(n.. - X_i) + X_i(n.. - X_i)] / n..} \times 100$

For tenure category “2. Owned... free and clear”

$$\frac{1}{n..}(X_{.2} + X_{2.} - 2X_{22}) = \frac{1}{18420}[4507 + 4356 - 2(3498)] \approx 0.101 > 0.1,$$

so the 90-percent confidence limits are

$$\frac{\left(4507 + 4356 - 2(3498) + \frac{1.645^2}{2}\right) \pm 1.645 \sqrt{\frac{1}{18420}(4507 + 4356 - 2(3498))(18420 - 4507 - 4356 + 2(3498))}}{[4507(18420 - 4356) + 4356(18420 - 4507)] / 18420} \times 100:$$

LCL \approx 26.8 and UCL \approx 28.8.

For marital status category “4. Separated”

$$\frac{1}{n..}(X_{.4} + X_{4.} - 2X_{44}) = \frac{1}{18409.5500}[268.2150 + 250.7990 - 2(169.5200)] \approx 0.01 \leq 0.1,$$

so the 90-percent confidence limits are

$$\frac{\left(268.2150 + 250.7990 - 2(169.5200) + \frac{1.645^2}{2}\right) \pm \frac{1.645}{2} \sqrt{1.645^2 + 4(268.2150 + 250.7990 - 2(169.5200))}}{[268.2150(18409.5500 - 250.7990) + 250.7990(18409.5500 - 268.2150)] / 18409.5500} \times 100:$$

LCL \approx 31.1 and UCL \approx 39.8

B.2.5 90-percent confidence interval for aggregate index of inconsistency

General formula

If ...	Then the confidence limits for the index are...
$\frac{n.. - \sum_{i=1}^L X_{ii}}{n..} \leq 0.1$	$\frac{(n.. - \sum_{i=1}^L X_{ii} + \frac{Z^2}{2}) \pm \frac{Z}{2} \sqrt{Z^2 + 4(n.. - \sum_{i=1}^L X_{ii})}}{n.. - \frac{1}{n..} \sum_{i=1}^L X_i X_i} \times 100$
$\frac{n.. - \sum_{i=1}^L X_{ii}}{n..} > 0.1$	$\frac{(n.. - \sum_{i=1}^L X_{ii} + \frac{Z^2}{2}) \pm Z \sqrt{\frac{1}{n..} \left(n.. - \sum_{i=1}^L X_{ii}\right) \left(\sum_{i=1}^L X_{ii}\right)}}{n.. - \frac{1}{n..} \sum_{i=1}^L X_i X_i} \times 100$

For tenure

$$\frac{n.. - \sum_{i=1}^4 X_{ii}}{n..} = \frac{18420 - (8226 + 3498 + 4192 + 231)}{18420} = \frac{18420 - 16147}{18420} \approx 0.12 > 0.1, \quad \sum_{i=1}^4 X_{ii} = 16147,$$

$$\text{and } \sum_{i=1}^4 X_{.i} X_{i.} = 9134(9227) + 4507(4356) + 4359(4454) + 420(383) = 123487756,$$

so the 90-percent confidence limits are

$$\frac{(18420 - 16147 + \frac{1.645^2}{2}) \pm 1.645 \sqrt{\frac{1}{18420} (18420 - 16147)(16147)}}{18420 - \frac{1}{18420} (123487756)} \times 100:$$

LCL \approx 18.8 and UCL \approx 20.0.

For marital status

$$\frac{n.. - \sum_{i=1}^5 X_{ii}}{n..} = \frac{18409.5500 - (8654.2000 + 1017.1000 + 1192.5000 + 169.5200 + 6717.1000)}{18409.5500}$$

$$= \frac{18409.5500 - 17750.4200}{18409.5500} \approx 0.04 < 0.1,$$

$$\sum_{i=1}^5 X_{ii} = 17750.4200, \text{ and}$$

$$\sum_{i=1}^5 X_{.i} X_{i.} = 8842.6900(8827.2100) + 1067.4100(1080.9600) + 1369.3800(1315.9700) + 268.2150(250.7990) + 6861.8500(6934.6200)$$

$$= 128663762.4080,$$

so the 90-percent confidence limits are

$$\frac{(18409.5500 - 17750.4200 + \frac{1.645^2}{2}) \pm \frac{1.645}{2} \sqrt{1.645^2 + 4(18409.5500 - 17750.4200)}}{18409.5500 - \frac{1}{18409.5500} (128663762.4080)} \times 100:$$

LCL \approx 5.4 and UCL \approx 6.2.

B.3 Weights in the CRS and weighted crosstabs

B.3.1 Assigning weights for the CRS

If the size of a household is k ($1 \leq k \leq 12$) then the probability of selection $P(k)$ of an individual in that household is $1/k$. A preliminary weight for that individual is $1/P(k)=k$. We scale the preliminary weights so that the sum of all weights is the number of households with a sample-person match. That is, the weight for a household of size k_o is

$$\text{weight} = \frac{k_o}{\sum_{k=1}^{12} m_k \cdot k} \times 100,$$

where m_k is the number of households with k members.

B.3.2 Weighted crosstabs

The “count” in cell (i,j) , CRS category i and census category j , for a “weighted crosstab” is found as follows:

1. Find the number of each size household that is in CRS category i and census category j .
2. Multiply the number of such households by the weight of the household.
3. Add these products together.

As an example, in the next table we find the count for the $(4,4)$ cell of the weighted crosstab for marital status.

Table B.4 Households (HHLDs) in category “4. Separated” for both CRS and Census 2000

Size of HHLD	Number of HHLDs, m	Weight of HHLD, wgt	$m^* wgt$
1	112	0.387039	43.348368
2	52	0.774079	40.252108
3	33	1.161118	38.316894
4	8	1.548157	12.385256
5	5	1.935197	9.675985
6	6	2.322236	13.933416
7	2	2.709275	5.418550
8	2	3.096314	6.192628
9	0	3.483354	0.000000
10	0	3.870393	0.000000
11	0	4.257432	0.000000
12	0	4.644472	0.000000
Sum	220		169.523205

Up to rounding error, this agrees well with the entry X_{44} of table B.3.

