Assessing if Mode of Data Collection Impacts Reporting of Race and Hispanic Origin

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ABSTRACT

It is critical that questions designed to collect data on race and Hispanic origin result in the collection of consistent data. If a respondent is asked to report their race at two different points in time, their response should be the same. This paper examines the issue of consistency in the reporting of race and Hispanic origin by mode of data collection to determine if mode affects consistency of response. This study is based on data from two U. S. Census Bureau surveys--the 2000 Decennial Census and the 2000 American Community Survey. Race and Hispanic origin responses for a sample of persons interviewed in both of these surveys were compared, taking into account the mode of data collection. Reliability measures produced from these data provide evidence that in this application, mode had an effect on consistency in the reporting of race and Hispanic origin.

INTRODUCTION

Survey designers strive to develop questions and methods that will result in the production of reliable results. A reliable response to the race question would be a response that would be provided consistently, whenever asked. The mode of data collection should not impact the reliability of results. Collecting race data by mail (self-administered) should provide reliable results, as should race data collected by telephone and personal visit (interviewer-administered) methods. This paper considers research on the race question and research on data reliability to assess if mode of data collection is likely to have an impact on the reliability of race data. We hypothesize that a question, such as race, with known problems of interpretation (primarily for the Hispanic population) is a prime candidate for reliability problems.

Errors of reliability result from response bias as well as response variance. Bias occurs when responses differ from truth in a systematic pattern or direction. This can occur, for example, if respondents consistently understate a measure such as, English proficiency. Variance, on the other hand, reflects random variation in response and occurs when a respondent provides a different response when the same question is asked multiple times. We further suggest that interviewer-collected data will hold greater potential for response bias and response variance because of interviewer effects. Using data from a match study between Census 2000 and the American Community Survey, assessments are made of the reliability of race reporting by mode. The work is extended to see if similar findings hold for collecting data on Hispanic Origin.

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[1] This paper reports the results of research and analysis undertaken by Census Bureau staff. It has undergone a Census Bureau review more limited in scope than that given to official Census Bureau publications. This report is released to inform interested parties of ongoing research and to encourage discussion of work in progress. The authors thank Harland Shoemaker, Tammy Adams, David Hubble, and Raj Singh for their insights and comments.

BACKGROUND

Much has been written noting the complexity of collecting data on race. Gerber and Martin (2001) provide an excellent summary of wording and conceptual issues in the race question as well as issues relating to administering the race question. They identify many reasons to believe that collecting reliable race data will be fraught with difficulty. Bennett and Griffin (2002) compare race reporting in the American Community Survey and Census 2000. They conclude that the differences in question wording were likely explanations for differences in the race results from these two data collection activities. Bates, Martin, DeMaio, and de la Puente (1995) in comparing 1990 Census and reinterview data found that Hispanics were more inconsistent over time in reporting of race than other ethnic groups. The Census 2000 content reinterview identified race as one of several items having low levels of reliability (Singer and Ennis, 2003).

As new modes of data collection are developed, survey methods research is needed to determine if changes in response mode are resulting in changes in the survey data. In a mixed-mode survey it is important that survey questions administered under each mode provide consistent results. To date most studies designed to assess reliability rely on reinterview methods or administrative records. Rather than measuring a mode effect (i.e., if individuals provide a different answer to a question depending on the mode of data collection) they measure reliability either for the new mode or for multiple modes. Studies of response variance and response bias are frequently targeted at self-administered surveys and are often used as tools to identify questions that may be confusing for a respondent. Limited reinterview studies have been done focusing on interviewer-collected data. Bushery (1992) calculated reinterview-based measures of reliability in the mixed-mode (mail and Computer Assisted Telephone Interviewing - CATI) 1993 National Survey of College Graduates and the CATI only 1995 National Survey of Recent College Graduates. He concluded that a mixed mode mail/CATI survey had a slight edge in reliability over an all CATI survey.

Much attention has been given to the potential for interviewer effects, suggesting that the presence of an interviewer may lead to different responses. Most of this research centers on factors of social desirability and anonymity (De Leeuw, 1987, DeMaio, 1984) with applications of responses dealing with behavior or attitudes. It is unclear if one should expect such factors to impact reporting (or recording) of race. Other arguments for reliability differences across modes note that self-response may lead to higher quality data because respondents can respond at their own pace and take their time to read all categories before responding (Bishop, 1988). It is reasonable to believe that for a question such as race, having time to carefully review the question and response options could result in higher quality responses. Removing the interviewer could reduce potential bias in how the question was posed and how responses were recorded. This is where the authors believe the greatest opportunity exists for interviewer error to impact the collection of race data.

We hypothesize that a question, such as race, with known problems of interpretation (primarily for the Hispanic population) is a prime candidate for reliability problems. We further suggest that interviewer-collected data will hold greater potential for response bias and response variance because of interviewer effects. To investigate this hypothesis, data were examined from two Census Bureau

research projects - a match study and a debriefing study. An overview of these studies is provided below. More detailed background information on the match study can be found in Raglin and Leslie (2001). The debriefing study is detailed in Leslie, Raglin, and Schwede (2002).

THE AMERICAN COMMUNITY SURVEY

The American Community Survey (ACS) is a new survey that the Census Bureau has been testing since 1996. Designed to produce the data historically resulting from the decennial "long form", the ACS collects data on basic demographics such as race and Hispanic Origin, on social characteristics such as education and disability, economic characteristics such as employment and income, and housing characteristics such as home value and rent. Data are collected using three sequential modes– mail, computer-assisted telephone interviewing (CATI), and computer assisted personal interviewing (CAPI). The Census 2000 Supplementary Survey or C2SS was a survey of about 900,000 addresses conducted in 2000 using ACS data collection methods. It was designed to test the feasibility of collecting long form data on a national level separate from, but concurrent with, the decennial census. Throughout this report the C2SS will be referred to as the ACS.

CENSUS 2000-ACS MATCH STUDY

In 2000, the Census Bureau conducted both the Decennial Census of Population and Housing and the American Community Survey (ACS). The ACS included a series of monthly national samples. The samples for the months of March, April, and May were the basis for this evaluation because those were the three primary months of data collection for Census 2000. Data were collected for approximately 361,000 persons in these three months in the ACS.

To compare Census 2000 and ACS responses to the race and Hispanic origin questions, ACS sample addresses were matched to Census 2000. ACS sample persons were then matched to persons in the Census files. We were able to match about 90 percent of the ACS sample persons to Census 2000 records. Details of the matching methodology and results can be found in Raglin and Leslie (2002). Once matched, the race and Hispanic origin data in the ACS were compared to the Census 2000 race and Hispanic origin data. This study used data prior to formal editing and imputation in order to isolate reporting differences. The only editing that was done was to take the races and Hispanic origin groups recorded as write-ins and code them to the appropriate check box group.

The focus of this study is mode of data collection. Respondents, therefore, were partitioned into two groups for analysis. All persons who responded by mail in both surveys were studied to assess reliability in the data collected by mail. This universe included about 204,000 persons. Similarly, all persons who were interviewed by personal visit in both Census 2000 and the ACS were studied to assess the reliability of data collected by interviewers. This universe was about 16,000 persons.

INTERVIEWER DEBRIEFING STUDY

The Census Bureau conducted a study in the fall of 2001 to determine if interviewer behavior was one reason for the large difference in race reporting for Hispanics in the C2SS compared to the Census. The study is described in detail by Leslie, Raglin, and Schwede (2002). A self-administered paper-and-pencil questionnaire was developed for ACS interviewers to complete. It asked them several questions to determine how they handle complex situations in administering the race and Hispanic origin questions. The situations included ones where Hispanics attempted to answer the race question by responding that they were Hispanic or that none of the given race categories fit them. Several methods to handle the situation were presented, and the interviewer was asked to pick the method they most used. There was a box to check if the interviewer did not use any of the listed techniques.

The interviewers were promised confidentiality, and towards that end, they were given postage-paid envelopes to return the questionnaires directly to the research staff, as opposed to their supervisors or regional office staff. There were 915 questionnaires received, 76 percent of the number mailed out. For the analysis, interviewers were classified based on their Census 2000 experience–most of their interviewing experience was from Census 2000, some was from Census 2000, and none was from Census 2000–and the differences in behavior among those groups was noted. The assumption was that the interviewers with primary experience on Census 2000 were a proxy for Census 2000 interviewers in general.

ANALYSIS

The analysis of the match study results reported in this paper relies primarily on statistics used when comparing two sets of matched categorical data that are measuring the same phenomena. The first statistic is the Net Difference Rate (NDR). Using race as an example, the NDR is defined as the estimated difference between the estimates of the percent in each race group between the Census and the ACS. The second statistic is the Gross Difference Rate (GDR). The GDR is defined as the expected percentage of people whose race group reported in the ACS is different than the race group reported in the Census.

Net Difference Rate

Define

$n_{.i}$ as the ACS population estimate for the i^{th} race group among people who reported race in both ACS and Census,
$n_{i.}$ as the Census population estimate for the i^{th} race group in both, and
$n_{..}$ is the total population reporting race in both ACS and the Census.

The NDR for the i^{th} race group, is estimated as

$(n_{.i} - n_{i.}) / n_{..}$.

With j race groups, an overall NDR for the race variable is estimated by summing the absolute values of those differences over i from 1 to j.

$$\Sigma\ (\text{abs}(n_{.i} - n_{i.})) / n_{..}.$$

For example, if the ACS estimates 500 people in a given race group and the census estimates 510 people in this given race group, and there are 1000 total people reporting race, the NDR for this race group is (500 - 510) / 1000 = -0.01 = -1.0 percent.

Gross Difference Rate

Define

n_{ii} as the total population reporting the i^{th} race in both the ACS and the Census,
$n_{.i}$ as the ACS population estimate for the i^{th} race group with race in both,
$n_{i.}$ as the Census population estimate for the i^{th} race group with race in both, and
$n_{..}$ is the total population reporting race in both ACS and the Census.

The overall GDR is estimated by summing i from 1 to j for all of the j race groups

$$1 - \Sigma\ (n_{ii}) / n_{..}.$$

The GDR at the individual race group level is defined for the i^{th} race group as

$$1 - ((n_{i.} + n_{.i} - 2*n_{ii}) / n_{..})$$

This is the percentage of people who reported a race and reported a different race in the ACS than in the Census or vice versa.

A GDR value of 5 percent in a given race group means that of the people who reported a race in both the ACS and the Census, about 5 percent reported the given race in one of the data collection operations but not the other.

Often, statistics like the NDR and GDR are calculated when one survey is the original measure and the second is an identical reinterview. In that case, if the two interviews are identical, the NDR should be close to zero and the NDR is considered to be a measure of bias (Singer and Ennis, 1993). The GDR/2 is in that case, if any errors are uncorrelated, an estimate of the simple response variance (SRV) or the average variability of responses to the same question over repeated trials. There is no claim that the Census and the ACS were identical. Some differences existed in the question wording and implementation of the survey questions. There is also no claim that either the Census or the ACS produce a gold standard from which any deviation is considered an error.

Without the assumption of something approaching an exact reinterview, the GDR/2 is not a good estimate of the SRV–it underestimates the SRV. However, it does become a measure of the inconsistency in the reporting of race, as is the GDR at the race group level. If the NDR is low and the GDR is high for race, then we can conclude that there is a lot of variability in the race responses between ACS and Census, but that it tends to even out. If both the NDR and GDR are high, we can

say that there are a lot of differences between ACS and Census, and they tend to go in one direction (a tendency to answer the given race in one survey but not the other).

The purpose of this analysis is to measure differences in actual race responses, therefore the NDR and GDR are calculated using only sample cases with a race response in both Census 2000 and the ACS. If a person did not have a reported race in either the Census or the ACS, that person is not used in the calculation of the statistics.

The weights used were the C2SS sampling weights, taking into account all stages of sampling, including subsampling for CAPI cases. Those weights were multiplied by four to take into account that the match study only included cases from three of the twelve monthly C2SS panels in 2000. The weights did not include the adjustments for unit nonresponse or controls to Census 2000. No attempt was made to impute or adjust weights for cases missing race in the ACS or the Census, or ACS sample cases for which a match was not found in the Census. The standard errors presented in this paper were calculated using a jackknife procedure.

The estimates in this report are based on responses from a sample of the population. As with all surveys, estimates may vary from the actual values because of sampling variation or other factors. All comparisons made in this report have undergone statistical testing and are significant at the 90-percent confidence level unless otherwise noted.

RESULTS

Data are presented separately for two subsets of the matched people: people who responded by mail in both the ACS and the Census, and people who were interviewed by personal visit follow-up in both the ACS and the Census. This allows us to look at the two modes to see if one of the modes produced more consistent data than the other. Results for all of the matched people can be found in Raglin and Leslie (2002).

Tables 1 through 4 include the Census and ACS distributions and the NDR and GDR for the mail and personal visit universes separately. Tables 1 through 3 summarize data on the race question. Given that most of the large differences in race reporting are for Hispanics, we analyzed race reporting for Hispanics and non Hispanics separately. Table 4 summarizes results for the Hispanic origin question. The cross tabulations that are the source for the statistics in each of these tables can be found in the appendix.

Table 1 shows that the overall NDR and GDR are fairly large for people whose race data were collected by personal visit, while they are very small for people who responded by mail. It is important to recall that this study did not randomly assign modes to sample cases. Data were collected by personal visit when households had not responded to the mail questionnaire. In many instances these households can be considered harder to collect data from. The greater variability in responses for households interviewed by personal visit may, therefore, be due to the universe itself.

Differences also existed in the personal visit data collection methods. The Census used, out of necessity, inexperienced interviewers, and the data were collected on paper questionnaires. To contrast, ACS data were collected by permanent interviewers using a computer-assisted instrument. Many of these permanent interviewers work on other Census Bureau surveys that do not have a *Some other race* category, so they are used to getting respondents to identify a specific race group. ACS staff noted that race differences existed in the data collected by personal interview and designed a study to try to assess if interviewer behavior could have contributed to these differences. The results of that debriefing study are discussed later in this paper.

Focusing on the mail results, the NDRs for every race category are low indicating that for this universe the overall proportion of persons reporting in each race group was very similar in the ACS and Census 2000. The highest GDR values are found for *White* and *Two or more races.* The GDR of 1.4 percent for *Two or more races* means that of the persons reporting race, 1.4 percent reported *Two or more races* in ACS but not the Census or vice versa. The GDR values of less than one percent for all other race groups are good news. Fewer than one percent of the persons reporting by mail as *Black, Asian, Native Hawaiian and Other Pacific Islander, American Indian and Alaska Native,* and *Some other race* in the ACS reported in a different race group in Census 2000. The total GDR of 2.2 percent is also low. These results indicate that the race data collected by mail in the ACS and Census 2000 were highly consistent.

The results in Table 1 for data collected by personal visit show higher levels of inconsistency, as measured by NDR and GDR for *White* and *Some other race* than for the other race groups. The differences observed in the data collected by personal visit are driven by greater reporting of *White* in the ACS and greater reporting of *Some other race* in the Census.[2] The *White* and *Some other race* groups have NDRs of between 4 and 5 percent. The GDR values for *White* and *Some other race* are 11.0 percent and 9.2 percent, respectively. A greater level of inconsistency, as measured by the GDR, is seen for *Two or more races* in this mode, when compared with mail. Here we could say that about 3.5 percent of the persons reporting race reported *Two or more races* in the ACS but not the Census or vice versa. Around 10 percent of the persons reporting as *White* or *Some other race* in the ACS reported another race in Census 2000, as shown in Appendix Table A-1b. The GDR of 13.5 for data collected by personal visit suggests problems with the reliability of race data collected by interviewers compared with the 2.2 percent GDR for mail cases.

[2]The Census allowed non-household proxies to provide information in personal visit interviews, which could be a reason for the larger NDR and GDR results for the personal visit-personal visit groups. However, we found that over 90 percent of the data for the people in this study were obtained in the Census from a household member who had lived there on Census Day, April 1, 2000. There is no substantial difference in the statistics calculated excluding the proxies in any of the tables presented. Therefore, we are including all people interviewed by personal visit in thee tables, including those for which the Census data were obtained from a non-household proxy.

Table 1: Race Distributions and Analytical Statistics by Mode, Census 2000 and ACS

Mail	Census		ACS		NDR		GDR	
Race	Percent of Total	Standard Error	Percent of Total	Standard Error	Percent of Total	Standard Error	Percent of Total	Standard Error
White	83.8	(1.0)	82.9	(1.0)	0.1	(0.1)	1.6	(0.1)
Black	6.8	(0.4)	6.6	(0.4)	-0.0	(0.0)	0.3	(0.0)
Asian	3.4	(0.5)	3.4	(0.5)	-0.0	(0.0)	0.2	(0.0)
NHOPI	0.1	(0.0)	0.1	(0.0)	-0.0	(0.0)	0.0	(0.0)
AIAN	0.5	(0.0)	0.5	(0.0)	0.0	(0.0)	0.2	(0.0)
Some other race	1.9	(0.2)	1.6	(0.2)	-0.1	(0.0)	0.8	(0.1)
Two or more races[&]	1.5	(0.1)	1.5	(0.1)	0.0	(0.0)	1.4	(0.1)
Missing*	2.0	(0.2)	3.4	(0.2)	----	-----	----	-----
Total	100.0	-----	100.0	-----	0.3	(0.1)	2.2	(0.2)

Personal Visit	Census		ACS		NDR		GDR	
Race	Percent of Total	Standard Error	Percent of Total	Standard Error	Percent of Total	Standard Error	Percent of Total	Standard Error
White	60.0	(1.4)	64.9	(1.3)	4.5	(0.8)	11.0	(0.9)
Black	20.4	(1.1)	20.5	(1.1)	0.0	(0.2)	1.6	(0.2)
Asian	3.9	(0.4)	3.8	(0.4)	-0.1	(0.1)	0.8	(0.1)
NHOPI	0.2	(0.1)	0.2	(0.1)	-0.0	(0.0)	0.1	(0.0)
AIAN	1.8	(0.3)	1.7	(0.3)	-0.1	(0.1)	0.8	(0.1)
Some other race	9.4	(0.9)	5.0	(0.6)	-4.8	(0.8)	9.2	(0.9)
Two or more races[&]	2.3	(0.2)	2.8	(0.2)	0.5	(0.3)	3.5	(0.3)
Missing*	1.9	(0.2)	0.9	(0.1)	----	-----	----	-----
Total	100.0	----	100.0	-----	10.1	(1.7)	13.5	(0.9)

N = 113.3 million for the mail universe and 23.9 million for the personal visit universe.
NHOPI = Native Hawaiian and Other Pacific Islander
AIAN = American Indian and Alaska Native
& All people reporting Two or more races are in that category; the rest of the race categories are for people reporting that race only.
*People missing race in either the Census or the ACS are not included in the NDR and GDR statistics–therefore, the NDR is not defined as the ACS percentage shown minus the Census percentage shown.

Table 2 includes distributions and statistics for the people who reported as Hispanic in either the ACS or the Census. This table shows that mode differences exist for Hispanics answering the race question. Noteworthy inconsistencies exist in the reporting of *White* and *Some other race* for Hispanics on mail returned forms (GDR for *White* is 15.3 percent, 12.9 percent for *Some other race*, with no others over 10 percent) but more notable differences are seen in the reporting of *White* and *Some other race* in the data collected from Hispanics by interviewers. Here the NDRs are 24.6 percent and -23.9 percent, respectively. The GDRs are both about 43 percent. This means that for Hispanics interviewed by personal visit in the Census and the ACS, about 43 percent of the race responses had *White* in the ACS but not the Census or vice versa. The same was also found for *Some other race*.

The NDR and GDR values for the race groups of *White* and *Some other race* are very large for the persons interviewed by personal visit, leading to a large overall NDR and GDR. To contrast, while the same pattern exists for the persons interviewed by mail, it is nowhere near as large.

Table 2: Race Distributions and Analytical Statistics by Mode - Hispanic Population Only, Census 2000 and ACS

Mail	Census		ACS		NDR		GDR	
Race	Percent of Total	Standard Error	Percent of Total	Standard Error	Percent of Total	Standard Error	Percent of Total	Standard Error
White	48.3	(2.5)	49.6	(2.4)	2.1	(0.8)	15.3	(0.8)
Black	1.9	(0.3)	2.1	(0.3)	0.1	(0.1)	1.1	(0.2)
Asian	0.5	(0.1)	0.5	(0.1)	-0.1	(0.1)	0.3	(0.1)
NHOPI	0.1	(0.0)	0.0	(0.0)	-0.0	(0.0)	0.0	(0.0)
AIAN	1.2	(0.1)	1.0	(0.1)	-0.0	(0.1)	0.9	(0.1)
Some other race	25.6	(1.4)	21.5	(1.2)	-2.0	(0.7)	12.9	(0.7)
Two or more races[&]	6.2	(0.4)	5.9	(0.4)	-0.1	(0.5)	8.9	(0.5)
Missing*	16.3	(1.1)	19.5	(1.3)	----	-----	----	-----
Total	100.0	-----	100.0	-----	4.5	(1.7)	19.7	(0.9)

Personal Visit	Census		ACS		NDR		GDR	
Race	Percent of Total	Standard Error	Percent of Total	Standard Error	Percent of Total	Standard Error	Percent of Total	Standard Error
White	44.4	(2.3)	68.2	(2.8)	24.6	(2.9)	43.2	(1.9)
Black	2.7	(0.6)	2.8	(0.7)	0.1	(0.5)	2.3	(0.6)
Asian	0.3	(0.1)	0.2	(0.1)	-0.1	(0.2)	0.6	(0.2)
NHOPI	0.0	(0.0)	0.1	(0.1)	0.1	(0.1)	0.1	(0.1)
AIAN	0.8	(0.2)	1.3	(0.3)	0.5	(0.4)	1.5	(0.4)
Some other race	44.3	(2.0)	22.8	(2.5)	-23.9	(2.9)	43.5	(2.0)
Two or more races[&]	4.1	(0.5)	3.1	(0.5)	-1.2	(0.7)	6.4	(0.8)
Missing*	3.3	(0.7)	1.5	(0.4)	----	-----	----	-----
Total	100.0	----	100.0	-----	50.5	(4.8)	48.8	(2.0)

N = 7.9 million for the mail universe and 4.9 million for the personal visit universe.
NHOPI = Native Hawaiian and Other Pacific Islander
AIAN = American Indian and Alaska Native
& All people reporting Two or more races are in that category; the rest of the race categories are for people reporting that race only.
* People missing race in either the Census or the ACS are not included in the NDR and GDR statistics–therefore, the NDR is not defined as the ACS percentage shown minus the Census percentage shown.

Table 3 displays the statistics for non-Hispanics in both the ACS and the Census. The NDR and GDR statistics for the persons interviewed by mail are very low. The NDRs are less than 0.05 percent for each race group and only 0.1 percent overall. None of the individual GDRs are over one percent and the overall rate is only 1.2 percent. This indicates that for the non Hispanic respondents who are willing to mail back survey questionnaires, we have methods that collect consistent race

data. These data suggest that, despite minor differences, the mail methods used in the ACS and in Census 2000 are collecting very consistent race data for non Hispanics.

Table 3: Race Distributions and Analytical Statistics by Mode - Non Hispanic Population Only, Census 2000 and ACS

Mail	Census		ACS		NDR		GDR	
Race	Percent of Total	Standard Error	Percent of Total	Standard Error	Percent of Total	Standard Error	Percent of Total	Standard Error
White	86.5	(0.8)	85.5	(0.8)	0.0	(0.0)	0.8	(0.0)
Black	7.1	(0.5)	7.0	(0.4)	-0.0	(0.0)	0.2	(0.0)
Asian	3.7	(0.5)	3.6	(0.5)	-0.0	(0.0)	0.2	(0.0)
NHOPI	0.1	(0.0)	0.1	(0.0)	-0.0	(0.0)	0.0	(0.0)
AIAN	0.4	(0.0)	0.4	(0.0)	0.0	(0.0)	0.2	(0.0)
Some other race	0.1	(0.0)	0.1	(0.0)	-0.0	(0.0)	0.1	(0.0)
Two or more races[&]	1.2	(0.1)	1.2	(0.1)	0.0	(0.0)	0.9	(0.1)
Missing*	1.0	(0.0)	2.2	(0.1)	----	-----	----	-----
Total	100.0	-----	100.0	-----	0.1	(0.1)	1.2	(0.0)

Personal Visit	Census		ACS		NDR		GDR	
Race	Percent of Total	Standard Error	Percent of Total	Standard Error	Percent of Total	Standard Error	Percent of Total	Standard Error
White	64.1	(1.5)	64.1	(1.5)	-0.6	(0.3)	2.8	(0.3)
Black	24.9	(1.3)	25.1	(1.4)	-0.0	(0.2)	1.4	(0.2)
Asian	4.9	(0.6)	4.8	(0.6)	-0.1	(0.2)	0.9	(0.2)
NHOPI	0.3	(0.1)	0.2	(0.1)	-0.0	(0.0)	0.1	(0.0)
AIAN	2.1	(0.4)	1.9	(0.4)	-0.3	(0.1)	0.7	(0.1)
Some other race	0.4	(0.1)	0.4	(0.1)	0.0	(0.1)	0.5	(0.2)
Two or more races[&]	1.8	(0.2)	2.8	(0.3)	1.0	(0.3)	2.8	(0.3)
Missing*	1.6	(0.2)	0.8	(0.1)	----	-----	----	-----
Total	100.0	----	100.0	-----	2.0	(0.7)	4.6	(0.0)

N = 105.3 million for the mail universe and 19.0 million for the personal visit universe.
NHOPI = Native Hawaiian and Other Pacific Islander
AIAN = American Indian and Alaska Native
& All people reporting Two or more races are in that category; the rest of the race categories are for people reporting that race only.
*People missing race in either the Census or the ACS are not included in the NDR and GDR statistics–therefore, the NDR is not defined as the ACS percentage shown minus the Census percentage shown.

The statistics for the persons interviewed by personal visit are also relatively low–all of the NDRs are at one percent or less. The areas of greatest concern involve the *Two or more races* category. A GDR value of 2.8 for personal visit means that about 2.8 percent of the non Hispanic persons providing a response for race had *Two or more races* in the ACS but not the Census or vice versa. Although that difference for the *Two or more races* GDR is not significantly different that the *White* GDR, it is from a much smaller category, and therefore more notable. The results in Table 3 indicate that non Hispanics have less trouble with the race question across both modes than Hispanics, which is consistent with the literature, and that responses collected by mail were more consistent than those for collected by interviewers.

Table 4 includes key analytical statistics for the Hispanic origin question. As in the previous race tables, the results are shown separately by mode of data collection. The distribution of Hispanic origin is different for the two mode groups, but that was expected since Hispanics tend to have a lower response rate by mail.

The data for persons interviewed by mail indicate that Hispanic origin data were collected consistently in the Census and the ACS. The overall NDR is under one percent and the overall GDR is just over one percent. The mail distribution was more concentrated in one response category (non-Hispanic), which tends to lower the difference rates (i.e., when most of the population is in one category, there is less opportunity for differences). Differences in the *Other Hispanic/Latino* and *Mexican* categories indicate that in the ACS slightly fewer mail respondents chose the generic *Other* category and slightly more choose the *Mexican* category.

The overall NDR and the GDR were higher for households interviewed in person, but they were still relatively low. The GDR value of 3.0 for *Mexican* means that about 3 percent of the people reporting *Mexican* in the ACS reported in another Hispanic origin category in Census 2000 or vice versa. A review of the methods used in the ACS found that an additional instruction was included in the CAPI instrument that provided clarification that the other Hispanic/Latino category sought to obtain a specific detailed group such as Salvadoran or Columbian rather than a choice of Hispanic versus Latino. We believe that this difference in procedures is the major explanation for the results found in Table 4.

Table 4: Hispanic Origin Distributions and Analytical Statistics by Mode, Census 2000 and ACS

Mail	Census		ACS		NDR		GDR	
Hispanic Origin	Percent of Total	Standard Error	Percent of Total	Standard Error	Percent of Total	Standard Error	Percent of Total	Standard Error
Non Hispanic	91.0	(0.8)	88.8	(0.8)	0.0	(0.0)	0.6	(0.0)
Mexican	3.6	(0.5)	3.7	(0.5)	0.2	(0.0)	0.7	(0.1)
Puerto Rican	0.7	(0.1)	0.7	(0.1)	0.0	(0.0)	0.1	(0.0)
Cuban	0.3	(0.2)	0.3	(0.2)	0.0	(0.0)	0.0	(0.0)
Other Hispanic/Latino	2.1	(0.2)	1.7	(0.2)	-0.3	(0.0)	0.8	(0.1)
Missing*	2.3	(0.1)	4.8	(0.1)	----	-----	----	-----
Total	100.0	-----	100.0	-----	0.6	(0.1)	1.1	(0.2)

Personal Visit	Census		ACS		NDR		GDR	
	Percent of Total	Standard Error	Percent of Total	Standard Error	Percent of Total	Standard Error	Percent of Total	Standard Error
Non Hispanic	79.3	(1.8)	79.9	(1.9)	-0.4	(0.2)	2.4	(0.3)
Mexican	12.4	(1.5)	13.2	(1.7)	0.8	(0.3)	3.0	(0.4)
Puerto Rican	2.1	(0.3)	2.3	(0.3)	0.2	(0.1)	0.6	(0.1)
Cuban	0.4	(0.2)	0.4	(0.2)	-0.0	(0.1)	0.2	(0.1)
Other Hispanic/Latino	4.2	(0.5)	3.7	(0.6)	-0.6	(0.3)	2.6	(0.3)
Missing*	1.6	(0.2)	0.6	(0.1)	----	-----	----	-----
Total	100.0	----	100.0	-----	2.1	(0.7)	4.4	(0.5)

N = 113.3 million for the mail universe and 23.9 million for the personal visit universe.
*People missing race in either the Census or the ACS are not included in the NDR and GDR statistics–therefore, the NDR is not defined as the ACS percentage shown minus the Census percentage shown.

Insights from the Debriefing Study

To study the interviewer effect, the Census Bureau surveyed some ACS interviewers on how they collected race data. The study is briefly described earlier in this paper–for more details on the design and results, see Leslie, Raglin, and Schwede, 2002.

When the ACS respondent answered the race question by saying "Hispanic", the interviewers with primarily Census 2000 experience were less likely to explain that Hispanic was not a race than the interviewers with no Census 2000 experience. If the Hispanic respondent said "none of these" to the race question, the interviewers with primarily Census 2000 experience were also less likely to repeat the question and show the flashcard with the race categories and more likely to simply mark *Some other race* and ask for a race for the write-in. If the Hispanic respondent responded to the race question with "White and Hispanic", the interviews with more Census 2000 experience were more likely to mark *White* and *Some other race* and type "Hispanic" for the other race. The report concluded that the interviewers who worked on the Census were more likely to accept a *Some other*

race or *Hispanic* answer to the race question than the interviewers with all of their experience outside of Census 2000. Assuming the interviewers who worked on the Census acted the same way when they worked on the Census, the results of this study help explain the differences shown for Hispanics whose data were collected by personal visit for both the Census and the ACS.

CONCLUSION

Our goal was to assess if the mode of data collection had an impact on the consistency of reporting of race and Hispanic origin data. We found such an effect for race, with data collected by mail being more consistent than data collected by personal visit. We acknowledge that the study universes are self-selected–most personal visit cases are households that could have responded by mail but chose not to. In addition, we must recognize that the personal visit methods used in the ACS differed in several respects from those used in Census 2000. Most notably, the instruments were automated in the ACS and paper in Census 2000. However, we see such large differences that we feel that we can conclude that mode impacted the consistency of race and Hispanic origin data in our application. This effect was especially true for Hispanics when compared to non-Hispanics. That was not surprising, given that Hispanics traditionally have more trouble answering the Census Bureau's race question because "Hispanic" is not given as a race category.

The results for Hispanic origin suggest that the current methods are resulting in the collection of consistent data but that personal visit responses were less consistent. We believe that this was mostly a consequence of a different set of instructions (including examples) used in the ACS during personal visit.

Collecting race data by mail appears to provide the most consistent results. About half of the people in the study, non Hispanics who return the mail questionnaire, provided very consistent race data. Even Hispanics, responding by mail, provided fairly consistent race response with the exception of reporting differences in *White* and *Some other race*. Therefore, unless there is a need to change the race question to meet the needs of data users, research to focus on learning how to improve the collection of race data by mail from Hispanics would be most fruitful.

Race data collected by personal visit were less reliable - for both the Hispanic and non Hispanic populations. Major consistency problems were found in comparing the responses to the race questions for Hispanics interviewed by personal visit in Census 2000 and in the ACS. These differences are highly concentrated in the *White* and *Some other race* categories, with noteworthy differences found in the reporting of *Two or more races*. The study by Leslie, Raglin, and Schwede (2002) provided evidence based on an interviewer debriefing that the way the interviewer handled responses to the race question for Hispanics varied based on their experience in Census 2000. Special attention is needed in researching the methods of collecting race data by interviewers. Developing the best questions is only part of the research–procedures to instruct interviewers on what they should do when a respondent feels that none of the categories applies are also important. This could be someone looking for a race category of *Hispanic* or a person wanting to provide an

ancestry as a response. Should the interviewer probe and re-explain the race question or accept the respondent confusion as a response of *Some other race*? Once the procedures have been developed, they would be used to train both the ACS and Census interviewers. Further research is needed to improve interviewer understanding of the purpose of the question and their role in helping gain a correct, but self-identified, race response.

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Cross Tabulations of Responses for Matched Persons
Census 2000 and ACS, Hispanic Origin and Race

Table A-1a, Cross Tabulation of Race, Census 2000 and ACS, Mail

ACS Race	Census Race								
	White	Black	Asian	NHOPI	AIAN	Other	2+ Races	Missing	Total
White	92,070,924	40,704	48,661	5,835	40,366	324,902	446,559	993,446	93,971,396
Black	30,385	7,294,259	6,182	0	10,288	13,978	72,019	61,309	7,488,421
Asian	25,483	5,481	3,686,599	2,976	1,701	2,836	56,141	67,264	3,848,481
NHOPI	1,024	0	2,387	62,123	0	0	8,544	4,044	78,123
AIAN	40,453	5,503	2,596	280	409,359	12,524	59,705	8,090	538,510
Other	263,131	13,200	7,701	0	8,796	1,169,145	73,476	268,924	1,804,373
2+Races	416,625	92,096	67,003	9,486	39,556	129,553	911,640	59,711	1,725,670
Missing	2,085,709	233,130	77,191	4,317	28,461	485,497	82,814	839,685	3,836,804
Total	94,933,733	7,684,373	3,898,321	85,018	538,527	2,138,436	1,710,897	2,302,473	113,291,777

Table A-1b, Cross Tabulation of Race, Census 2000 and ACS, Personal Visit

ACS Race	Census Race								
	White	Black	Asian	NHOPI	AIAN	Other	2+ Races	Missing	Total
White	13,454,028	33,438	34,777	2,792	52,601	1,494,883	175,583	245,802	15,493,903
Black	72,070	4,635,035	5,189	2,331	12,927	19,723	77,770	68,032	4,893,077
Asian	19,186	350	826,988	0	6,696	32,064	18,484	13,392	917,159
NHOPI	3,282	0	0	39,352	0	960	4,500	2,232	50,326
AIAN	35,687	990	2,232	0	317,798	29,496	14,124	16,861	417,187
Other	383,469	28,268	26,784	0	14,142	583,129	57,842	103,044	1,196,677
2+Races	235,050	122,407	38,313	6,298	26,466	41,396	195,401	9,792	675,122
Missing	129,552	38,184	7,004	2,232	3,217	41,448	2,552	2,552	226,741
Total	14,332,323	4,858,672	941,286	53,005	433,846	2,243,098	546,257	461,707	23,870,192

Cross Tabulations of Responses for Matched Persons
Census 2000 and ACS, Hispanic Origin and Race

Table A-2a, Cross Tabulation of Race, Census 2000 and ACS - Hispanic Population, Mail

ACS Race	Census Race								
	White	Black	Asian	NHOPI	AIAN	Other	2+ Races	Missing	Total
White	3,123,358	5,127	851	744	10,839	306,863	177,252	312,245	3,937,279
Black	9,845	118,649	0	0	744	9,792	14,874	11,981	165,884
Asian	1,488	0	22,883	0	0	180	4,551	6,941	36,043
NHOPI	0	0	0	1,788	0	0	0	744	2,532
AIAN	6,090	0	0	0	50,746	12,480	6,485	6,352	82,153
Other	243,155	7,111	180	0	7,308	1,128,769	57,678	260,638	1,704,839
2+Races	118,459	15,568	9,665	1,366	7,345	100,289	174,636	41,321	468,649
Missing	332,521	5,541	3,544	2,673	16,255	477,263	57,019	651,092	1,545,908
Total	3,834,916	151,995	37,122	6,571	93,237	2,035,635	492,497	1,291,315	7,943,288

Table A-2b, Cross Tabulation of Race, Census 2000 and ACS - Hispanic Population, Personal Visit

ACS Race	Census Race								
	White	Black	Asian	NHOPI	AIAN	Other	2+ Races	Missing	Total
White	1,710,583	6,374	0	240	2,652	1,481,491	91,760	54,144	3,347,244
Black	5,304	81,254	2,232	0	2,931	15,821	30,026	990	138,558
Asian	2,232	0	900	0	0	6,696	900	0	10,728
NHOPI	420	0	0	0	0	960	3,600	0	4,980
AIAN	16,104	0	0	0	14,476	29,496	1,680	350	62,105
Other	364,031	22,524	8,928	0	11,910	560,405	49,507	103,044	1,120,349
2+Races	46,864	22,320	4,909	900	7,366	39,164	24,293	3,933	149,749
Missing	32,238	0	0	0	2,232	41,448	0	0	75,918
Total	2,177,776	132,473	16,969	1,140	41,566	2,175,480	201,766	162,460	4,909,631

Cross Tabulations of Responses for Matched Persons
Census 2000 and ACS, Hispanic Origin and Race

Table A-3a, Cross Tabulation of Race, Census 2000 and ACS - Non Hispanic Population, Mail

ACS Race	Census Race								
	White	Black	Asian	NHOPI	AIAN	Other	2+ Races	Missing	Total
White	88,947,566	35,577	47,810	5,091	29,527	18,039	269,307	681,200	90,034,117
Black	20,541	7,175,611	6,182	0	9,544	4,186	57,145	49,328	7,322,536
Asian	23,995	5,481	3,663,717	2,976	1,701	2,656	51,589	60,323	3,812,438
NHOPI	1,024	0	2,387	60,335	0	0	8,544	3,300	75,591
AIAN	34,363	5,503	2,596	280	358,613	44	53,219	1,738	456,358
Other	19,975	6,090	7,521	0	1,488	40,376	15,797	8,286	99,533
2+Races	298,166	76,528	57,338	8,120	32,211	29,264	737,004	18,391	1,257,021
Missing	1,753,188	227,589	73,647	1,644	12,206	8,234	25,795	188,593	2,290,896
Total	91,098,817	7,532,378	3,861,199	78,446	445,290	102,800	1,218,401	1,011,158	105,348,489

Table A-3b, Cross Tabulation of Race, Census 2000 and ACS - Non Hispanic Population, Personal Visit

ACS Race	Census Race								
	White	Black	Asian	NHOPI	AIAN	Other	2+ Races	Missing	Total
White	11,743,444	27,064	34,777	2,552	49,949	13,392	83,823	191,658	12,146,659
Black	66,766	4,553,781	2,957	2,331	9,996	3,902	47,745	67,043	4,754,519
Asian	16,954	350	826,088	0	6,696	25,368	17,584	13,392	906,431
NHOPI	2,862	0	0	39,352	0	0	900	2,232	45,346
AIAN	19,583	990	2,232	0	303,322	0	12,444	16,511	355,082
Other	19,438	5,744	17,856	0	2,232	22,724	8,334	0	76,329
2+Races	188,186	100,087	33,404	5,398	19,100	2,232	171,108	5,859	525,374
Missing	97,315	38,184	7,004	2,232	985	0	2,552	2,552	150,823
Total	12,154,547	4,726,199	924,317	51,865	392,279	67,617	344,490	299,247	18,960,561

Cross Tabulations of Responses for Matched Persons
Census 2000 and ACS, Hispanic Origin and Race

Table A-4a, Cross Tabulation of Hispanic Origin, Census 2000 and ACS, Mail

ACS Hispanic Origin	Census Hispanic Origin						
	Non Hispanic	Mexican	Puerto Rican	Cuban	Other His	Missing	Total
Non Hispanic	98,401,642	129,571	16,958	8,789	176,160	1,821,757	100,554,877
Mexican	136,386	3,649,932	2,232	0	340,277	41,094	4,169,921
Puerto Rican	20,141	1,595	761,558	744	41,916	8,620	834,574
Cuban	16,848	0	233	336,191	16,645	5,208	375,125
Other Hispanic	127,617	127,498	14,519	4,128	1,634,911	38,935	1,947,612
Missing	4,412,196	118,629	22,259	10,660	133,030	712,895	5,409,668
Total	103,114,830	4,027,225	817,759	360,512	2,342,940	2,628,510	113,291,777

Table A-4b, Cross Tabulation of Hispanic Origin, Census 2000 and ACS, Personal Visit

ACS Hispanic Origin	Census Hispanic Origin						
	Non Hispanic	Mexican	Puerto Rican	Cuban	Other His	Missing	Total
Non Hispanic	18,492,700	122,303	27,198	14,790	66,445	351,492	19,074,928
Mexican	169,503	2,689,599	14,592	0	262,751	12,164	3,148,609
Puerto Rican	63,995	4,352	444,949	0	27,959	466	541,721
Cuban	2,232	0	4,464	68,170	9,821	0	84,687
Other Hispanic	94,840	122,244	6,769	5,227	627,846	21,839	878,766
Missing	114,138	20,648	0	0	4,464	2,232	141,482
Total	18,937,408	2,959,146	497,972	88,187	999,287	388,193	23,870,192