**Improving Measurement of Same-Sex Couple Households in Census Bureau Surveys: Results from Recent Tests**
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Abstract:

Over the past decade, the U.S. Census Bureau worked to improve measurement of same-sex couple households in its demographic surveys and the decennial census. This paper presents results from recent testing of the revised relationship question. We have found four ways to greatly improve the quality of the estimate of same-sex married couple households: additional relationship categories; the move to internet response; the addition of a check for consistency between the reports of sex and relationship in data collection via electronic instruments; and use in data processing of what is essentially an implied sex value reported for coupled households via the relationship question. We conclude with a discussion of next steps in the testing and implementation of the revised relationship question on Census Bureau surveys and the census.

**INTRODUCTION**

Since the 2010 Census, the Census Bureau has worked to improve measurement of same-sex couple households in its demographic surveys, as well as for the next Census. These surveys ask how everyone in the household is related to the householder, or reference person—someone who owns or rents the home. Historically, estimates of coupled households have been derived from the relationship question and the sex reported for the householder and their spouse or partner.[1] The June 2015 Supreme Court decision that legalized same-sex marriage in all states increased the need for estimates of same-sex married couples, since some federal agencies administer programs based on marital status.

In reviewing the Census 2010 data, the Census Bureau became aware of a reporting error that affects data quality. When two groups are related, and a very small proportion of the large group makes mismarks, their answers can affect the estimates of the smaller group. In order to investigate this issue, we compared the sex reported in the 2010 Census and 2010 ACS with the Social Security record and found that a high percentage of those reported as same-sex married couples were likely opposite-sex married couples (Kreider and Lofquist, 2015). Figure 1 shows the percentage of coupled households by whether their sex reported in the 2010 ACS or the 2010 Census matched the value on the Social Security record. About 57 percent of those reported as same-sex married couples in the 2010 ACS are opposite-sex in the Social Security data file, compared to 73 percent of those in the 2010 Census.[2] This drops to about 65 percent when excluding cases from 2010 Census Non-Response Follow-up (NRFU). The paper

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[1] Keep in mind that this measure only includes couples, whether same-sex or opposite sex, where one member is the householder. If the child of the householder and the child's partner live in the household, they will not be included in the estimate of couples based on this measure. For this reason, we often refer to it as 'coupled households.'

[2] Note that these percentages are out of the subset of responses for records we could match to the Social Security file, and who had names that were reported to be male (or female) at least 95 percent of the time. In order to determine this, we created an index showing the number of times the name was reported as male. These values are stored on the person record, so that it is possible to see how often each name is reported as male (or conversely, as female). For this project, the names index created based on Census 2010 data was used.

form used in the NRFU operations had a known issue since the response options for the sex question were placed such that it was easy to mark both responses (O'Connell and Feliz, 2011). The effect of mismarks on the estimate of same-sex married couple households is substantial. Working in the context of an OMB-led interagency group focused on measuring household relationships in federal surveys, the Census Bureau revised the relationship question to list additional categories and to address these kinds of reporting error.

Through quantitative tests of the revised relationship question, we have found four ways to improve the quality of the estimate of same-sex married couple households. The first is the addition of specific answer categories for coupled households. The second is the move to internet response. Third, the revised relationship question, which is similar to that used in other countries (e.g., Canada, the United Kingdom, New Zealand) that make these estimates, allows for an additional check for consistency between the reports of sex and relationship in data collection via electronic instruments. Finally, since the revised relationship question contains what is essentially an implied sex value for coupled households, this is additional information that can be used when editing responses.

Results from recent testing that the Census Bureau has conducted as preparation for the 2020 Census, and the 2016 American Community Survey (ACS) Content Test show how these changes contribute to improved estimates of same-sex married couple households in particular. We also examine the operation of an automated relationship/sex consistency check which is included in electronic modes, including internet, Computer Assisted Telephone Interviews (CATI), Computer Assisted Personal Interviews (CAPI), and NRFU.

1. **Revisions to the relationship to householder question**

A series of focus groups and cognitive testing led to the development of the revised relationship question. The results indicated that respondents wanted to see a category for same-sex spouses, and wanted to see the spouse and unmarried partner categories treated similarly (DeMaio, Bates and O'Connell, 2013). Figure 2 shows the relationship question fielded in the 2010 Census, and the newly developed question. The categories for spouse and partner are spelled out so that respondents can choose opposite-sex spouse or same-sex spouse. The same is true for the unmarried partner categories. The unmarried partner categories now appear immediately after the spouse categories.

Highlights from recent testing

The Census Bureau has tested the new question in several surveys over the last few years. These tests included the 2013 ACS Questionnaire Design Test (QDT), the Department of Housing and Urban Development's 2013 American Housing Survey (AHS), the tests leading up to the 2014 panel of the Survey of Income and Program Participation (SIPP), and tests that were part of the decennial testing program.[3]

We focus here on results from the 2015 National Content Test (NCT) and the 2016 ACS Content Test (ACS CT) since they included paper and internet modes, were nationally representative, and included both the old and new relationship question. We also include some results from the 2016 Census Test

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[3] For results of ACS-QDT and the AHS test, see the following publications. Lewis, Jamie M. 2014. "Testing Alternative Relationship and Marital Status Questions on the 2013 American Community Survey-Questionnaire Design Test: Final Report." *2014 American Community Survey Research and Evaluation Report Memorandum Series #ACS14-RER-16*. U.S. Census Bureau: Washington, DC, available online at: https://www.census.gov/content/dam/Census/library/working-papers/2014/acs/2014_Lewis_01.pdf Lofquist, Daphne A., and Jamie M. Lewis. 2015. "Improving Measurement of Same-Sex Couples." *SEHSD Working Paper 2015-13*. U.S. Census Bureau: Washington, DC, available online at: http://www.census.gov/hhes/samesex/files/Lofquist_Lewis_2015-13.pdf Results of the 2014 Census Test can be found in: Bentley, M., Rothhaas, C. (2016). "2020 Census Research and Testing: 2014 Census Test Results for Optimizing Self-Response." 2020 Census Program Memorandum Series #2016.04. U.S. Census Bureau. June 14, 2016.

(CT), which included several versions of the new relationship question, but was not nationally representative.

Testing has gone smoothly. Respondents have not had major issues with the new categories.[4] When respondents commented on the new categories, it was clear that they understood what we mean by them. The new question collects data comparable with the old question. Item non-response was low, and did not differ when comparing the new question with the old (see Figure 3). Few respondents failed to answer the relationship question (about 0.5 percent), and this did not differ between the control and test relationship questions. The distributions of relationship categories did not differ from the old question to the new (see Figure 4). The percentage of spouses or partners reported did not differ across the control and test relationship questions. This was true in both the 2015 National Content Test and the 2016 ACS CT.

Test details: 2015 National Content Test, 2016 ACS Content Test, and 2016 Census Test

The 2015 National Content Test (NCT) was fielded in the fall of 2015. The test was nationally representative, with a sample of about 1.18 million households. This is the largest test fielded during the decennial testing program, and employed a split panel design for the relationship question, allowing comparisons of the control and test questions. The test included paper, internet, and Telephone Questionnaire Assistance (TQA) modes. The internet instrument contained an automated check, which was triggered when the reported sex values for the householder and their spouse or partner did not agree with the relationship value chosen (e.g., both the householder and their spouse or partner were

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[4] For example, Nichols, Elizabeth, Erica Olmsted-Hawala, and Rebecca Keegan. 2015. "Usability Testing of the 2014 Census Test Online English Instrument," Survey Methodology Study Series 2015-04, Center for Survey Measurement, Research and Methodology Directorate, U.S. Census Bureau. available online at http://www.census.gov/srd/papers/pdf/ssm2015-04.pdf

reported as male and their relationship was reported as opposite-sex). We will describe the check in detail later in the paper. The results were weighted using a basic household weight. Non-response followup was not included in the 2015 NCT.

The 2016 ACS CT consisted of a nationally representative sample of 70,000 residential addresses in the United States and was independent of the production ACS sample. The Content Test sample universe did not include GQs, nor did it include housing units in Alaska, Hawaii, or Puerto Rico.[5] The sample design for the 2016 ACS CT was largely based on the ACS production sample design with some modifications to better meet the test objectives.[6] The modifications included adding an additional level of stratification by stratifying addresses into high and low self-response areas, over-sampling addresses from low self-response areas to ensure equal response from both strata, and sampling units as pairs.[7] The high and low self-response strata were defined based on ACS self-response rates at the tract level. Sampled pairs were formed by first systematically sampling an address within the defined sampling stratum and then pairing that address with the address listed next in the geographically sorted list. Note that the pair was likely not neighboring addresses. One member of the pair was randomly assigned to receive the control version of the question and the other member was assigned to receive the test version of the question, thus resulting in a sample of 35,000 control cases and 35,000 test cases.

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[5] Alaska and Hawaii were excluded for cost reasons. GQs and Puerto Rico were excluded because the sample sizes required to produce reliable estimates would be overly large and burdensome, as well as costly.

[6] The ACS production sample design is described in Chapter 4 of the ACS Design and Methodology report (U.S. Census Bureau, 2014).

[7] Tracts with the highest response rate based on data from the 2013 and 2014 ACS were assigned to the high response stratum in such a way that 75 percent of the housing units in the population (based on 2010 Census estimates) were in the high response areas; all other tracts were designated in the low response strata. Self-response rates were used as a proxy for overall cooperation. Oversampling in low response areas helps to mitigate larger variances due to CAPI subsampling. This stratification at the tract level was successfully used in previous ACS Content Tests, as well as the ACS Voluntary Test in 2003.

As in the production ACS, an attempt was made to contact a sample of nonresponding addresses after efforts to reach a sampled address by mail, and telephone. Nonresponding addresses were sampled at a rate of 1-in-3, with some exceptions that were sampled at a higher rate.[8] For the Content Test, the development of workload estimates for the CAPI did not take into account the over-sampling of low response areas. This over-sampling resulted in a higher than expected workload for CAPI and therefore required more budget than was allocated. To address this issue, the CAPI sampling rate for the Content Test was adjusted to meet the budget constraint.

The 2016 Census Test (CT) was conducted with a census day of April 1, 2016. Possible modes of response included Internet, TQA, Mail, and Non-response Followup (NRFU). Only a sample of nonrespondents were sent to NRFU. The 2016 CT was a site test, fielded in Harris County, Texas and Los Angeles County, California. The results are not nationally representative. A total of roughly 450,000 households were included, split evenly between the two counties, with about 120,000 of those going to NRFU. A coverage re-interview was also conducted, but is not examined here. Three versions of the relationship question were included. Figure 5 shows the internet version that included the largest list of response categories. Two other versions were also fielded in the Internet, TQA and NRFU modes, one without 'Roomer or Boarder' and one without either 'Roomer or Boarder' or 'Housemate or Roommate.' Those three versions are not the focus of this paper, but Figure 6 shows that the percentage of those marking the nonrelative categories: roomer or boarder, roommate or housemate, foster child, and other nonrelative are about 3 percent or less across the three different treatments.

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[8] The ACS production sample design for CAPI follow-up is described in Chapter 4, Section 4.4 of the ACS Design and Methodology report (U.S. Census Bureau, 2014).

Since the revised relationship question contains explicit response categories for opposite-sex and same-sex spouses and partners, it is possible to compare the relationship response with the sex values reported for the householders and their partners or spouses, and see if the relationship and sex reports are consistent. Figure 7 shows the percentage of cases that had inconsistent relationship and sex reports, by couple type. The percentage of responses for which the relationship category chosen does not agree with the sex values reported for the householder and their spouse or partner in the new question is shown. For example, if the spouse/partner is reported as a 'same-sex spouse,' but the householder is reported as male, and the spouse is reported as female, then the case is shown as inconsistent. Keep in mind that samples are not large, especially for smaller groups like same-sex married couples.

The lower inconsistency rates for self-response may also be related to the fact that data collected in non-response follow up operations is known to be of lower quality.[9] The group of respondents who do not respond initially, and are then contacted by a field representative (FR) are not a random group; they tend to be less inclined to respond at all. In addition, the FR has many cases to complete, while a self-responding household only has to provide their own information. The FR's main goal is to obtain an interview from an often reluctant respondent, and they may tend to skip checks in the field to save time or avoid what they think might be awkward situations.

One difference between internet and mail mode is that the internet instrument included an automated check between the relationship and sex reports in coupled households, and triggered a series of confirmation questions if their reported answers were inconsistent. The large group of opposite-sex

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[9] Bowling, Ann. 2005. "Mode of questionnaire administration can have serious effects on data quality." *J Public Health*, 27 (3): 281-291. doi: 10.1093/pubmed/fdi031

married couples, which has a very small percentage that are inconsistent is actually the most important category in terms of its inadvertent effect on the estimates of same-sex married couples. To have the reduction in the inconsistent responses from 0.5 in NCT mail mode where there is no automated check, to 0.03 percent in the NCT internet mode for the largest group, opposite-sex married couples, for example, makes a substantial difference. We will return to this point when discussing improvement 2 below.

Inconsistency rates also vary within self-response, with the internet instrument obtaining higher quality data. Figure 8 shows the inconsistency rates by mode, for self-response only.[10] Rates for the internet instrument are lower than for the mail option. The percentages for mail for same-sex married couples are noticeably high. The inconsistency rates are higher for mail responses partly because internet mode makes some things easier for the respondent. That is, it fills in the names of the people for whom we are asking about relationship, reducing the chance that the respondent may forget who they have reported as the householder. For example, if opposite-sex spouses mark their spouse as the householder, but then answer as though they have marked themselves as the householder, they would be likely to report the same sex for both themselves and their spouse, causing an inconsistency between the relationship and sex reports. More specifically, while the paper form simply asks *how is this person related to person 1*, the internet instrument personalizes the question, asking *how is Mary related to John*. In addition, those who respond via the mail option are a different group than those who respond via the internet. Internet responders tend to be younger, more educated, and likely more experienced at filling out surveys.[11]

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[10] Keep in mind that some of these groups have small sample sizes in the ACS CT. For example, there were 19 same-sex spouses in ACS CT in the mail mode, and 40 in the internet mode.

[11] Matthews, Brenna. 2012. "2011 American Community Survey Internet Tests: Results from Second Test in November 2011- Revision," 2012 AMERICAN COMMUNITY SURVEY RESEARCH AND EVALUATION REPORT MEMORANDUM SERIES #ACS12-RER-21-R1 and DSSD 2012 AMERICAN COMMUNITY SURVEY

## 2. Automated check in electronic data collection reduces inconsistent relationship and sex reports

The new relationship question allows an automated check in electronic instruments that alerts the respondent when the reported relationship does not agree with the reported sex for the couple. In the 2015 NCT internet mode, if the respondent reported Mary as John's opposite-sex spouse, but then recorded them both as female, they received a series of confirmation questions that were triggered automatically. The first question in the check sequence asked: "Please confirm that your answers are correct. Mary is John's opposite-sex husband/wife/spouse. Is that correct?" Figure 9 illustrates the screen image seen by the respondent. If they said the relationship value was not correct, they were then shown a screen that re-asked the relationship question. If they said the relationship value was correct, they were then asked: "John is recorded as female. Is that correct?" See Figure 10 for an illustration of this question. The sex confirmation question was asked for both the householder and the spouse or partner. If the respondent said the answer was not correct, the sex question was asked again, and they could change the answer. However, the check is programmed as a 'soft edit' that respondents can ignore and move past (i.e., respondents can choose to leave the inconsistent responses as they originally reported them).

The 2016 ACS CT internet instrument also included an automated check that was set up basically parallel to the check as it operated in the 2015 NCT. As in the 2015 NCT, when the check was triggered, the respondent would get a screen asking them to confirm their answers, beginning with their report of relationship (see Figure 11). The images captured here lack the fills for the names of the householder

and the spouse/partner.  If the respondent said that their previous answer to relationship was not correct, they were taken back to the relationship question (see Figure 12). If they said their answer to relationship was correct, they were then asked to confirm the sex report for the householder (see Figure 13). If they said it was incorrect, they were re-asked the sex question (see Figure 14). If they said it was correct, they were asked to confirm the sex of the spouse/partner.  This series of confirmation questions in the 2015 NCT and 2016 ACS CT, and opportunity for the respondent to correct their answer on the relationship or sex questions, is an automated check sequence and therefore can only be added to automated instruments. The 2016 ACS CT also included a CATI/CAPI/NRFU component, which used the same check sequence, with the interviewer leading the respondent through the question series.

To examine the efficacy of the automated check, we have to focus on the internet mode responses.  The very small percentages in Figure 15 for opposite-sex couples in internet mode for the 2015 NCT indicate the inconsistency rate where the automated check was operating. The level of inconsistency for opposite-sex married couples was 0.03 percent. While both 0.5 and 0.03 appear to be small, because the group is so large, it translates into a substantial number of couples who could have been affecting the estimates of same-sex married couples. Since the automated check is effective in reducing mismarking error, we are committed to implementing the check in electronic instruments for the 2020 Census.

The 2016 CT instrument was set up somewhat differently than the other two tests. The questions were arranged in a person-based order, rather than topic-based. In the 2015 NCT and 2016 ACS CT respondents were led through the questions based on the topic, answering the relationship question for each household member, and then the sex question for each household member, for example.  But in the 2016 CT, respondents answered questions for a single household member before moving on to

another household member. In addition, limitations in the setup of the internet instrument meant that if the automated check was triggered, respondents saw the lengthy explanation on Figure 16 about how to change either the sex report for the householder, the spouse/partner, or their response to the relationship item. Unlike in the 2015 NCT and the 2016 ACS CT, we do not have output variables indicating responses to the confirmation questions, since separate questions did not exist, and there wasn't a coherent sequence to them. This limits the analysis we can do to investigate the function of the automated check in the 2016 CT internet mode. The 2016 CT CATI/CAPI/NRFU also used the internet instrument.

### 3. Joint editing of relationship and sex provides opportunity to improve data quality

There are also editing, that is post-processing, decisions that we are working to make. When people have inconsistent relationship and sex reports, or do not report relationship and/or sex, we may use their first name to assign their sex value. When we matched 2010 Census and 2010 ACS data to the Social Security file, we found first name is a very good predictor of sex for those with names that are reported as male (or female) at least 95 percent of the time (Kreider and Lofquist, 2015). First, we created a names index that shows the number of times the name is reported as male per thousand times the name is reported in Census 2010 data. For example, if the name John is reported as male 99 percent of the time, then the names index would show a value of 990. For those with names that were reported as male (or female) at least 95 percent of the time, [12] a very high percentage matched that sex value on their Social Security record—on the order of about 97 percent of the time. The majority of people have names that are reported as male (or female) 95 percent of the time.

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[12] A names index value of 950 or higher indicates that the name is reported as male at least 95 percent of the time, while a value of 50 or lower indicates the name is reported as female at least 95 percent of the time.

Analysis of the automated relationship/sex consistency check in the 2015 NCT also provides information we will use when editing responses. About 0.7 percent of coupled households in the 2015 NCT received the automated relationship/sex consistency check. We can see the cases that responded 'yes' or 'no' to at least one of the automated check questions, but it was not possible to distinguish between respondents who were out of universe for the check, and those who refused to answer all three confirmation questions, or navigated past them.

It is also useful to look at the operation of the check in the 2016 ACS CT. In the internet mode, just as in the 2015 NCT, about 0.7 percent of coupled households received the check. In CATI/CAPI, this was higher, at about 6 percent. This is understandable, given that those who respond via CATI/CAPI are likely to be more reluctant respondents, and an interview is involved. Unlike someone who is responding for their own household, the interviewer has many households for which they are trying to gain completed surveys, and so may be more in a hurry, or face other barriers as they work to convince the respondent to provide answers to the questions.

In terms of what respondents changed when they had the opportunity, Figure 17 shows the results for the 2015 NCT, the largest of the tests. Recall that the 2015 NCT included internet, but not NRFU. So, for the 0.7 percent of coupled households who received the consistency check, what did they change? Of the 780 married couples who changed something in the confirmation question series, the largest group, 46 percent, said the spouse's sex was incorrect (see Figure 17). The 25 percent who said everything was correct, but the relationship and sex values were inconsistent are a bit mystifying. A proportion of these 780 couples do come through with inconsistent relationship and sex values. Of the 64 unmarried couples who changed something in the confirmation check variables, the largest group, 27 percent, said

that the relationship was incorrect. Forty-four percent said everything was correct, even though the inconsistency in reporting suggests it was not.

We do not show parallel results for the 2016 ACS CT and 2016 CT here since sample sizes are smaller and CATI/CAPI/NRFU were included in those tests, so the results may not be strictly comparable. Given the large sample size of the 2015 NCT, we lean toward using those results to inform the editing process for the 2020 Census.

Responses for sex and relationship are edited together. For example, for the householder and their spouse (or partner), the edit will consider the following information:

1. Relationship report for the spouse;

2. Sex report for the householder;

3. Sex report for the spouse.

If the relationship reported agrees with the sex reported, then all is well. However, if the sex for the spouse is not reported, another answer is missing, or the relationship and sex reports are inconsistent, then the edit will consider whether:

1. The sex value is reported for the householder;

2. The sex value is reported for the spouse/partner;

3. The sex ratio value for the first name of the householder is 95 percent or higher;

4. The sex ratio value for the first name of the spouse is 95 percent or higher;

5. The sex reported for the householder matches the implied sex value based on assignment from the first name sex ratio index value;

6. The sex reported for the partner matches the implied sex value based on assignment from the first name sex ratio index value;

7. The reported relationship and sex values are consistent.

The edit contains rules for how to decide which values need to be assigned and how to assign them, depending on what information is available from the respondent's report and the sex ratio (number of males per 100 women) value of the reported first names. In the 2010 Census edit, first name sex values were only used to assign sex if it was missing. Since the revised relationship question contains an implied sex value, we can also make use of that information when relationship and sex reports are inconsistent, as well as using first name values to help establish our best approximation of what the respondent meant to report. Employing the first name index, as well as information gleaned from comparing the relationship and sex values for coupled households, will improve our editing processes and result in more accurate estimates of coupled households.

**Conclusions**

This paper outlined four improvements to data quality in the relationship question: including new relationship response categories; self-response, especially internet mode; the use of an automated consistency check in electronic instruments; and changes to editing procedures. While we have presented results from various earlier tests in other work, this paper concentrates on the 2015 National Content Tests as well as the two most recent tests that were fielded in 2016: the 2016 Census Test and the 2016 American Community Survey Content Test. We continue to test the new relationship question, as well as the operation of the automated check in 2017 and 2018 tests that are part of the decennial program.

Like any research, this work has limitations. These include the fact that the test data have not been edited and weighted as public use data would be. This means that these test data sets do not generate estimates of coupled households that we can compare with existing data sources, or with each other. It

would be ideal to be able to do so, in order to see whether the tests, at least those that were nationally

representative, end up providing comparable estimates. In addition, since we plan to use all available

data in the edit in order to reconcile cases where the relationship and sex reports are inconsistent, it

would be useful to know how that process will affect the estimates, especially for same-sex married

couple households.

Given the testing we have already conducted on the revised relationship question, we expect to move

forward with the new specific spouse/partner answer categories, and to implement the automated

check in electronic instruments. We plan to take name sex values into account in the editing process, as

well as the sex value implied by the reported relationship in coupled households. We expect that these

three actions will result in higher quality estimates of coupled households, particularly for same-sex

married couples in Census 2020.

**References**

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**Appendix Table 1. Response Distribution for Control and Test Treatment: ACS 2016 Content Test**

| | Combined | | | Internet | | |
|---|---|---|---|---|---|---|
| | UW | % | SE | UW | % | SE |
| **Control Panel (N=43,671)** | | | | | | |
| **Total Persons** | 43,671 | 100.0% | | 20,861 | 100.0% | |
| **Householder** | 17,688 | 39.8% | 0.21% | 8,073 | 38.9% | 0.23% |
| **Husband or Wife** | 8,222 | 19.4% | 0.19% | 4,440 | 23.1% | 0.22% |
| **Unmarried Partner** | 1,094 | 2.6% | 0.12% | 530 | 2.4% | 0.12% |
| **Other Relative** | 15,205 | 34.7% | 0.31% | 7,130 | 32.7% | 0.35% |
| **Other Non-Relative** | 1,373 | 3.2% | 0.15% | 686 | 2.9% | 0.17% |
| **Missing** | 72 | 0.1% | 0.04% | 2 | 0.0% | <0.01% |
| **Multiple Marks** | 17 | 0.0% | 0.01% | 0 | 0.0% | NA |
| **Test Panel (N=43,671)** | | | | | | |
| **Total Persons** | 43,593 | 100.0% | | 21,102 | 100.0% | |
| **Householder** | 17,596 | 39.9% | 0.24% | 8,105 | 38.5% | 0.23% |
| **Spouse** | 8,183 | 19.4% | 0.23% | 4,477 | 22.8% | 0.24% |
| **Opposite-Sex Spouse** | 8,105 | 19.3% | 0.23% | 4,437 | 22.6% | 0.24% |
| **Same-Sex Spouse** | 78 | 0.2% | 0.03% | 40 | 0.2% | 0.04% |
| **Unmarried Partner** | 1,157 | 2.7% | 0.13% | 556 | 2.5% | 0.14% |
| **Opposite-Sex Partner** | 1,087 | 2.6% | 0.13% | 512 | 2.3% | 0.12% |
| **Same-Sex Partner** | 70 | 0.1% | 0.03% | 44 | 0.2% | 0.05% |
| **Other Relative** | 15,219 | 34.5% | 0.36% | 7,265 | 33.0% | 0.41% |
| **Other Non-Relative** | 1,283 | 3.2% | 0.22% | 664 | 3.0% | 0.22% |
| **Missing** | 143 | 0.2% | 0.04% | 35 | 0.2% | 0.07% |
| **Multiple Marks** | 12 | 0.0% | 0.00% | 0 | 0.0% | NA |

**Appendix Table 1. Response Distribution for Control and Test Treatment: ACS 2016 Content Test (Continued)**

| | Mail | | | CAPI/CATI | | |
|---|---|---|---|---|---|---|
| | UW | % | SE | UW | % | SE |
| **Control Panel (N=43,671)** | | | | | | |
| **Total Persons** | 10,623 | 100.0% | | 12,187 | 100.0% | |
| **Householder** | 5,056 | 47.7% | 0.46% | 4,559 | 37.0% | 0.42% |
| **Husband or Wife** | 2,106 | 21.4% | 0.37% | 1,676 | 14.7% | 0.39% |
| **Unmarried Partner** | 207 | 1.9% | 0.16% | 357 | 3.2% | 0.24% |
| **Other Relative** | 2,924 | 26.2% | 0.56% | 5,151 | 41.0% | 0.61% |
| **Other Non-Relative** | 250 | 2.2% | 0.21% | 437 | 4.0% | 0.37% |
| **Missing** | 63 | 0.5% | 0.09% | 7 | 0.1% | 0.09% |
| **Multiple Marks** | 17 | 0.1% | 0.03% | 0 | 0.0% | NA |
| **Test Panel (N=43,671)** | | | | | | |
| **Total Persons** | 10,126 | 100.0% | | 12,365 | 100.0% | |
| **Householder** | 4,847 | 48.0% | 0.44% | 4,644 | 37.8% | 0.46% |
| **Spouse** | 2,024 | 21.8% | 0.42% | 1,682 | 14.8% | 0.38% |
| **Opposite-Sex Spouse** | 2,005 | 21.7% | 0.41% | 1,663 | 14.7% | 0.39% |
| **Same-Sex Spouse** | 19 | 0.2% | 0.06% | 19 | 0.2% | 0.06% |
| **Unmarried Partner** | 219 | 2.1% | 0.18% | 382 | 3.2% | 0.30% |
| **Opposite-Sex Partner** | 201 | 2.0% | 0.18% | 374 | 3.1% | 0.30% |
| **Same-Sex Partner** | 18 | 0.2% | 0.05% | 8 | 0.1% | 0.03% |
| **Other Relative** | 2,719 | 25.7% | 0.54% | 5,235 | 40.0% | 0.65% |
| **Other Non-Relative** | 207 | 1.7% | 0.20% | 412 | 4.1% | 0.48% |
| **Missing** | 98 | 0.7% | 0.13% | 10 | 0.1% | 0.03% |
| **Multiple Marks** | 12 | 0.1% | 0.02% | 0 | 0.0% | NA |

NOTE: CATI/CAPI refers to Computer Assisted Telephone Interview and Computer Assisted Personal Interview
Source: 2016 American Community Survey Content Test

**Appendix Table 2. Relationship Response Distributions in Control and Experimental Panels: 2015 NCT**

| Relationship | Combined | | | Internet | | |
|---|---|---|---|---|---|---|
| | UW | % | SE | UW | % | SE |
| **Control Panel** | | | | | | |
| Total Persons | 671,829 | 100.0% | | 471,440 | 100.0% | |
| Householder | 266,858 | 41.0% | 0.07% | 178,789 | 39.0% | 0.07% |
| Husband or Wife | 140,934 | 21.2% | 0.19% | 104,402 | 22.4% | 0.16% |
| Unmarried Partner | 14,660 | 2.4% | 0.03% | 10296 | 2.5% | 0.04% |
| Other Relative | 224,087 | 32.0% | 0.10% | 160,154 | 33.0% | 0.10% |
| Other non-relative | 22,459 | 2.9% | 0.07% | 16132 | 2.9% | 0.00% |
| Missing | 2619 | 0.4% | 0.02% | 1667 | 0.3% | 0.02% |
| Multiple Marks | 212 | 0.0% | 0.00% | 0 | 0.0% | N/A |
| **Test Panel** | | | | | | |
| Total Persons | 658,115 | 100.0% | | 468,804 | 100.0% | |
| Householder | 261,736 | 41.1% | 0.07% | 178,207 | 39.1% | 0.07% |
| Spouse | 138,326 | 21.2% | 0.18% | 103,766 | 22.4% | 0.15% |
|    Opposite-Sex Spouse | 137,093 | 21.0% | 0.18% | 102,814 | 22.1% | 0.15% |
|    Same-Sex Spouse | 1233 | 0.2% | 0.01% | 952 | 0.2% | 0.01% |
| Partner | 14,096 | 2.4% | 0.03% | 10166 | 2.5% | 0.04% |
|    Opposite-Sex Partner | 12,932 | 2.2% | 0.03% | 9235 | 2.2% | 0.04% |
|    Same-Sex Partner | 1164 | 0.2% | 0.01% | 931 | 0.2% | 0.01% |
| Other Relative | 218,953 | 32.0% | 0.11% | 158,795 | 32.8% | 0.11% |
| Other non-relative | 21,986 | 2.9% | 0.07% | 16060 | 3.0% | 0.08% |
| Missing | 2794 | 0.4% | 0.02% | 1810 | 0.3% | 0.02% |
| Multiple Marks | 224 | 0.0% | 0.00% | 0 | 0.0% | N/A |

**Appendix Table 2. Relationship Response Distributions in Control and Experimental Panels: 2015 NCT (Continued)**

| Relationship | Mail | | | Phone | | |
|---|---|---|---|---|---|---|
| | UW | % | SE | UW | % | SE |
| **Control Panel** | | | | | | |
| **Total Persons** | 147,614 | 100.0% | | 52,775 | 100.0% | |
| **Householder** | 58,816 | 41.4% | 0.13% | 29,253 | 56.3% | 0.3% |
| **Husband or Wife** | 26,910 | 18.4% | 0.17% | 9,622 | 18.7% | 0.18% |
| **Unmarried Partner** | 3667 | 2.7% | 0.06% | 697 | 1.4% | 0.07% |
| **Other Relative** | 52,552 | 33.8% | 0.23% | 11,381 | 20.3% | 0.33% |
| **Other non-relative** | 4865 | 3.0% | 0.08% | 1462 | 2.6% | 0.14% |
| **Missing** | 592 | 0.4% | 0.03% | 360 | 0.6% | 0.06% |
| **Multiple Marks** | 212 | 0.1% | 0.01% | 0 | 0.0% | N/A |
| **Test Panel** | | | | | | |
| **Total Persons** | 136,835 | 100.0% | | 52,476 | 100.0% | |
| **Householder** | 54,279 | 41.1% | 0.13% | 29,250 | 56.3% | 0.32% |
| **Spouse** | 24,932 | 18.4% | 0.18% | 9,628 | 19.1% | 0.21% |
| **Opposite-Sex Spouse** | 24,673 | 18.2% | 0.18% | 9,606 | 19.0% | 0.21% |
| **Same-Sex Spouse** | 259 | 0.2% | 0.01% | 22 | 0.0% | 0.01% |
| **Partner** | 3268 | 2.6% | 0.05% | 662 | 1.3% | 0.06% |
| **Opposite-Sex Partner** | 3067 | 2.5% | 0.05% | 630 | 1.2% | 0.06% |
| **Same-Sex Partner** | 201 | 0.2% | 0.01% | 32 | 0.1% | 0.02% |
| **Other Relative** | 48,901 | 34.2% | 0.21% | 11,257 | 20.3% | 0.37% |
| **Other non-relative** | 4543 | 3.0% | 0.08% | 1383 | 2.4% | 0.11% |
| **Missing** | 688 | 0.5% | 0.03% | 296 | 0.6% | 0.07% |
| **Multiple Marks** | 224 | 0.2% | 0.02% | 0 | 0.0% | N/A |

Source: 2015 National Content Test

**Appendix Table 3. CT 2016 Relationship by Panel - Internet/CQA**

| Relationship | Control | No roomer or boarder | No roomer or boarder and no housemate or roommate |
|---|---|---|---|
| Householder[1] | 40.8% (0.15) | 40.9% (0.15) | 40.9% (0.15) |
| Spouse or partner[2] | 21.6% (0.12) | 21.6% (0.13) | 21.8% (0.13) |
| Relative[3] | 33.6% (0.14) | 33.3% (0.14) | 33.3% (0.14) |
| Nonrelative | 3.2% (0.05) | 3.2% (0.05) | 3.0% (0.05) |
|     Roomer or boarder | 0.5% (0.02) | N/A | N/A |
|     Housemate or roommate | 1.8% (0.04) | 2.0% (0.04) | N/A |
|     Foster child | <0.1% (0.01) | <0.1% (0.01) | <0.1% (0.01) |
|     Other nonrelative | 0.9% (0.03) | 1.1% (0.03) | 3.0% (0.05) |
| Missing | 0.8% (0.03) | 1.0% (0.03) | 1.0% (0.03) |

Source: Decennial Census, 2016 Census Test

Notes: Estimates exclude non-response households and are weighted with standard errors in parentheses.

1: The reference person (the owner or renter of the housing unit) is counted as the householder. No relationship question is asked for the reference person since this person is the reference person for all other relationships.

2: Includes the groups opposite-sex husband/wife/spouse, opposite-sex married partner, same-sex husband/wife/spouse, and same-sex unmarried partner.

3: Includes the groups biological son or daughter, adopted son or daughter, stepson or stepdaughter, brother or sister, father or mother, grandchild, parent-in-law, son-in-law or daughter-in-law, and other relative.