

**MEASURING SAME-SEX COUPLES: THE WHAT AND WHO OF MISREPORTING ON RELATIONSHIP AND SEX****Jamie M. Lewis, Nancy Bates, and Matthew Streeter<sup>1</sup>****U.S. Census Bureau****ABSTRACT**

Prior research on same-sex couples has identified relative group size as a key issue in obtaining accurate estimates. If a small percentage of opposite-sex couples are misreported as same-sex, the impact on estimates of same-sex couples is substantial. Despite the Census Bureau's development of a revised relationship item, inconsistency in reports of couples' relationship versus sex persists. Here, we investigate relationship-sex inconsistency in the 2013 American Housing Survey. Results suggest inconsistencies are due more to errors on the relationship item than sex. Both inconsistent reports and mismarks on relationship are most common for couples whose relationship was reported as same-sex married, followed by same-sex unmarried, opposite-sex unmarried, and opposite-sex married couples. Older respondents and larger households are associated with mismarks on relationship, and returning households are less likely to have sex misreported. We suggest some strategies, such as educating interviewers about relative group size, to improve estimates of same-sex couples.

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<sup>1</sup> This paper is released to inform interested parties of ongoing research and to encourage discussion of work in progress. The views expressed on statistical or methodological issues are those of the authors and not necessarily those of the U.S. Census Bureau.

## **MEASURING SAME-SEX COUPLES: THE WHAT AND WHO OF MISREPORTING ON RELATIONSHIP AND SEX**

**Jamie M. Lewis, Nancy Bates, and Matthew Streeter**

### **INTRODUCTION**

Recent years have seen a call for improved estimates of same-sex couples. The need for quality estimates has grown in the first part of the 21<sup>st</sup> century, as recognition of same-sex couples has hastened. Massachusetts was the first state to perform same-sex marriage in 2004, and many additional states have followed suit. As of March 2015, thirty-seven states and the District of Columbia allow same-sex marriage. Several more states have received judicial rulings against a ban on same-sex marriage, though these decisions have been stayed pending appeal. Further, some states offer domestic partnerships or civil unions to same-sex couples that grant some or all the privileges of marriage.

Same-sex couples have also received greater recognition at the federal level. Although states retain the right to determine legal recognition of same-sex marriage, a June 2013 Supreme Court decision on the Defense of Marriage Act (DOMA) found Section 3 of the Act to be unconstitutional. That is, DOMA can no longer be used to bar same-sex married couples from receiving federal benefits. As a result, the Office of Personnel Management requires data on same-sex married couples to estimate beneficiaries. Other federal agencies may soon use this information for programmatic reasons, as marital status is a factor in many federal regulations and programs.

Quality data on same-sex couples is also needed to assess levels of discrimination. For example, the Department of Housing and Urban Development's (HUD) Office of Fair Housing and Equal Opportunity aims to ensure that all Americans have access to housing of their choice. More broadly, there is a desire to describe the characteristics and well-being of members of same-sex couples as well as children residing in households headed by these couples.

For all these reasons, researchers at the Census Bureau have been working to improve the measurement of same-sex couples, both married and unmarried. In this paper, we continue this research by investigating inconsistency in reports of couples' relationship status (i.e., same-sex married, same-sex unmarried, opposite-sex married, or opposite-sex unmarried) versus sex in an experiment conducted during the 2013 American Housing Survey (AHS). For instance, what is going on in cases where a couple is recorded as a same-sex married couple on the relationship item, but one person's sex is marked as male and the other's as female? The 2013 AHS data provide a unique opportunity because

the survey's split-panel design and large sample size allow us to investigate relationship-sex inconsistency for a substantial number of same-sex couples. Here, we estimate whether errors are more often made in reports of couples' relationship or sex, and explore which couples have inconsistent data. That is, we examine the what and who of misreporting on relationship and sex. Although a driving focus is improving estimates of same-sex couples, we assess relationship-sex inconsistency for both same- and opposite-sex couples. Further, the ultimate goal is a measurement strategy that accurately captures various relationship forms.

## BACKGROUND

### Relationship Measurement

Currently, the Census Bureau uses an indirect approach to measure couple type, including same-sex couples, in the 2010 Census and most Census surveys. Information from both the relationship to householder and sex items is needed to classify couples. Figure 1 shows the control relationship to householder item as it appears in the 2013 AHS. As an example of how this information is used to classify couples, if Person Two's relationship to Person One was recorded as 'Husband/wife/spouse,' and both Person One and Person Two's sex recorded as 'Male,' they would be considered a same-sex married couple.

#### What is Person Two's relationship to Person One?

- |                                               |                                              |
|-----------------------------------------------|----------------------------------------------|
| <input type="radio"/> 20. Husband/wife/spouse | <input type="radio"/> 26. Other relative     |
| <input type="radio"/> 21. Unmarried Partner   | <input type="radio"/> 27. Foster Child       |
| <input type="radio"/> 22. Son or daughter     | <input type="radio"/> 28. Housemate/roommate |
| <input type="radio"/> 23. Grandchild          | <input type="radio"/> 29. Roomer/boarder     |
| <input type="radio"/> 24. Father or mother    | <input type="radio"/> 30. Other nonrelative  |
| <input type="radio"/> 25. Brother or sister   |                                              |

Figure 1: Control Relationship to Householder Question from 2013 AHS

Census Bureau researchers have developed a revised relationship to householder item through focus groups and cognitive testing.<sup>2</sup> The Interagency Working Group on Measuring Relationships in Federal Household Surveys, convened by the Statistical and Science Policy Branch of the Office of Management and Budget, has recommended that this revised question be tested and used more widely (MRFHS 2014). The revised or test relationship item, as it appears in the AHS, is displayed in Figure 2. An important change in the revised item is the expansion of the ‘Husband/wife/spouse’ and ‘Unmarried Partner’ categories into separate choices for same- and opposite-sex couples. With this change, each of the four couple types of interest—same-sex married, same-sex unmarried, opposite-sex married, and opposite-sex unmarried—can be classified directly using only this item.

**What is Person Two's relationship to Person One?**

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<input type="radio"/> 1. Opposite-sex husband/wife/spouse	<input type="radio"/> 7. Stepson or stepdaughter
<input type="radio"/> 2. Opposite-sex unmarried partner	<input type="radio"/> 8. Grandchild
<input type="radio"/> 3. Same-sex husband/wife/spouse	<input type="radio"/> 9. Father or mother
<input type="radio"/> 4. Same-sex unmarried partner	<input type="radio"/> 10. Brother or sister
<input type="radio"/> 5. Biological son or daughter	<input type="radio"/> 11. Parent-in-law
<input type="radio"/> 6. Adopted son or daughter	<input type="radio"/> 12. Son-in-law or daughter-in-law
<input type="radio"/> 13. Other relative	
<input type="radio"/> 14. Foster child	
<input type="radio"/> 15. Housemate/roommate	
<input type="radio"/> 16. Roomer/boarder	
<input type="radio"/> 17. Other nonrelative	

Figure 2: Test Relationship to Householder Question from 2013 AHS

In addition to allowing direct measurement of couple type, the revised item can be compared to the couple members’ responses on the sex item for consistency. In effect, this comparison provides a check on the accuracy of reports on relationship and sex that is not possible when using the control relationship question. This new approach should prove useful in 1) estimating error rates for the various couple types, and 2) gaining insight into the nature and likely sources of these errors.

<sup>2</sup> DeMaio, Bates, and O’Connell (2013) provide a review of the qualitative testing that led to the revised relationship item.

## Previous Research

Prior research on the measurement of same-sex couples has identified the issue of relative group size as a key obstacle in obtaining accurate estimates (e.g., Cortina and Festy 2014; O’Connell and Feliz 2011). This is a statistical issue whereby a small amount of measurement error among a very large population leads to a large amount of error among a small population. In the case of couple measurement, if a small percentage of opposite-sex couples has incorrect information on relationship or sex and these couples are inadvertently recorded as same-sex couples, it has a substantial impact on estimates of same-sex couples. This issue is more problematic among married couples compared with unmarried couples, as opposite-sex married couples outnumber same-sex marrieds by a far greater margin than opposite- versus same-sex unmarried couples.

Using administrative records, Kreider and Lofquist (2015) found that some same-sex couples in Census data result from misreporting. They tested this by matching couples’ sex as reported on the 2010 Census or 2010 American Community Survey (ACS) to sex on file with the Social Security Administration (SSA). A substantial proportion of couples reported as same-sex in the ACS or 2010 Census appeared to be opposite-sex in the SSA data. This discrepancy was more problematic for same-sex married couples than for their unmarried counterparts. A full 57.3 percent of couples reported as same-sex married in the ACS and 72.5 percent of these couples in the 2010 Census appeared to be opposite-sex in SSA data, compared with 7.0 percent of same-sex unmarried couples in both the ACS and 2010 Census. Inconsistencies for reported opposite-sex couples were also found, but were much less common. In both the ACS and decennial Census, less than 1 percent of reported opposite-sex married couples appeared to be same-sex in the SSA data. This was true of 1.6 percent of opposite-sex unmarried couples in the ACS and 0.8 percent of these couples in the 2010 Census.

Both the 2010 ACS and 2010 Census used the current or control version of the relationship to householder item. Potentially, the revised relationship item, with its explicit categories for same- versus opposite-sex relationships, may reduce errors of this type. As part of their study, Lofquist and Lewis (2014) assessed the level of inconsistent reports on relationship and sex in the 2013 American Housing Survey (AHS) for the panel receiving the revised relationship question. They concluded that although it may be reduced, relationship-sex inconsistency remains an issue, particularly for couples reported as same-sex married on the relationship item. In the AHS, 55.9 percent of couples recorded as same-sex married on the relationship item and 12.7 percent of those marked as same-sex unmarried had opposite

sexes marked on the sex item. In contrast, 0.6 percent of couples reported as opposite-sex married and 1.8 percent of those marked as opposite-sex unmarried had same sexes marked on the sex item.

This phenomenon is not unique to the United States, and has been found to impact estimates of same-sex couples in other Western countries. In the 2001 Census of Canada, 26.4 percent of couples who had marked ‘Common-law partner (same-sex)’ on the relationship item reported one person as male and the other as female on the sex item (Cortina and Festy 2014).<sup>3</sup> Estimates of same-sex couples in the 2011 French census (Enquête annuelle de recensement, EAR) were corrected using information from an accompanying family and housing survey (Enquête famille et logement, EFL). Of those couples reported to be same-sex in the EAR, 43 percent were reclassified, mostly as opposite-sex couples (Banens 2013).<sup>4</sup> Thus, the issue of relative group size is pervasive, affecting estimates of same-sex couples for a variety of countries that measure relationship in different ways. Further, the Canadian example, which specifies the sex composition of common-law partnerships, provides additional evidence that explicit categories for same-and opposite-sex intimate relationships do not fully eliminate the problem.

### Current Study

Our research serves the effort toward more accurate estimates of same-sex couples by providing detailed information on misreports of couples’ relationship and sex. We investigate relationship-sex inconsistency for four types of couples—same-sex married, same-sex unmarried, opposite-sex married, and opposite-sex unmarried, classified according to their reports on the relationship item. In particular, we address two research questions:

- ***Are errors more often made on the relationship or sex item? What can we learn using couple members’ first names and the associated probability of being male?***
- ***Which couples are mismarked on relationship or sex? What are the characteristics of couples with inconsistent versus consistent reports on relationship and sex?***

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<sup>3</sup> Because Canada did not legalize same-sex marriage until 2005, the relationship item on the 2001 Census questionnaire had a single category for spouse: ‘Husband or wife.’

<sup>4</sup> The 2011 EAR asked relationship to householder using an open-ended field rather than specific categories, although some specific examples were offered, including: époux/épouse (spouse), union libre (free union, or cohabitation), fils/fille (son or daughter), mère/père (mother or father), and sous-locataire (subtenant).

In researching these questions, our study delineates the what and who of couples' relationship-sex inconsistency. The ultimate aim is to learn more about the sources of inconsistency on sex and relationship in order to develop improved strategies for addressing misreporting.

## **METHODOLOGY**

### **Data**

We used data from the 2013 American Housing Survey (AHS) to conduct our research. The AHS is sponsored by the Department of Housing and Urban Development (HUD), with data collected by the Census Bureau. Although the AHS is designed primarily to monitor housing supply, conditions, and costs, it also collects a wealth of demographic data. Further, its large sample size (the 2013 sample includes about 167,000 housing units) makes it a good candidate for studying same-sex couples, who comprise about 1 percent of all coupled households (Lofquist 2011).

The 2013 AHS was fielded from May through September of 2013, and was comprised of both national and metropolitan samples. More importantly, the survey featured a split-panel design, with about half of the sampled households receiving the control version of the relationship to householder item (see Figure 1), and the second half receiving the revised question (see Figure 2). We restricted our analysis to data from the test panel, as relationship-sex inconsistency can only be assessed using the revised relationship item. We further omitted interviews completed in a language other than English. Although both an English and Spanish version of the instrument was fielded, the Spanish translations require additional cognitive testing, and thus are not yet ready for quantitative analysis.

The AHS was interviewer-administered via an automated Computer-Assisted Personal Interviewing (CAPI) instrument. The interviewer could use the instrument to conduct interviews in-person or over the phone. The instrument included automated soft edits aimed at reducing inconsistencies on relationship and sex. In the test panel, these soft edits appeared when the recorded relationship did not match the recorded sexes of the couple members, providing interviewers an opportunity to correct errors on either item.<sup>5</sup>

The AHS is a panel survey of housing units, and uses dependent interviewing for returning households in order to reduce errors and respondent burden. Although sex was not asked or verified for

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<sup>5</sup> Because the AHS is interviewer-administered, it is difficult to determine whether a reporting error arises from the answer the respondent provides or the response the interviewer records. We consider both possibilities.

returning households, it was displayed in the roster, which interviewers could enter to make corrections. All respondents in the test panel, both new and returning, received the revised relationship item.

### **Method of Analysis**

In the initial part of our analysis, we describe what is going on with inconsistent reports on relationship and sex. First, we estimated the proportion of all coupled households that have inconsistent information on relationship and sex. Next, we used the first names of couple members and the associated probability that a given name is male to judge whether couples' relationship or their sex was misreported. We used a method similar to that employed by O'Connell and Feliz (2011). Information on the probability that a name is male was derived from the 2010 Census statistical names directory, and this probability was merged onto the 2013 AHS data.

The 2010 Census names directory was created at the state level from internal microdata on individual records. Each name in the directory has a value for the male probability index, which ranges from 0 to 1,000. The probability was obtained by taking the ratio of the number of times the name was recorded with a male response to the sex item to the total number of times the name was recorded as either male or female. We used the 95 percent rule, meaning that a person's probable sex was classified as male if that person's name had a value on the male probability index of 950 or more. This value means that when the name appeared in the 2010 Census for a given state, at least 950 times out of 1,000, or 95 percent of the time, the person was reported as male. A person's probable sex was classified as female if that person's name had a value on the male probability index of 50 or below.

Note that, using the 95 percent rule, probable sex can only be determined for a subset of the AHS sample. First, a value on the male probability index is not available for some names. This occurs where 1) there is not a full name for matching; 2) a name is not found in the names directory; or 3) in fewer than 10 of the cases used to create the directory, a sex was reported along with the name. Second, we do not determine probable sex for those with ambiguous names—names with a value between 51 and 949 on the male probability index (e.g., Jamie, Taylor, Sidney). Despite these limitations, we were able to apply this method to the majority of the sample. In 68.6 percent of couples with inconsistent reports on relationship and sex, both couple members had a value on the male probability index of 50 or below or 950 or above. That is, they fit the 95 percent rule, and we assigned probable sex. Using this method, we compared probable sex and reported sex to judge whether a



couples' relationship or sex was misreported. Analysis was conducted by couple type—same-sex married, same-sex unmarried, opposite-sex married, and opposite-sex unmarried.<sup>6</sup>

In the second part of the analysis, we investigate which couples have inconsistent reports on relationship or sex, in two stages. The first stage involved a logistic regression predicting the likelihood that a couple has inconsistent versus consistent reports on relationship and sex. All couples in the AHS test panel were analyzed in this stage. For the second stage, we ran a multinomial logistic regression model to understand which couples are more likely to 1) be misreported on sex or 2) have relationship incorrectly coded, compared with having consistent responses. This stage of analysis excluded couples that have inconsistent responses on relationship and sex but for whom we cannot determine which item was incorrectly marked (i.e., couples where at least one member has a name that is ambiguous or at least one member's probable sex cannot be determined using the names directory). Regression models include a number of demographic and social characteristics, including couple type, age of respondent, Hispanic origin of respondent, nativity of respondent, education of respondent, and number of people in the household. We also included information on whether the household was a returning household as a predictor.<sup>7</sup>

All analyses were conducted using unweighted data, for two reasons. First, we are concerned with investigating couples for whom errors were made on the relationship or sex item, rather than making statements generalizable to the larger population. Second, even with the large size of the overall AHS sample, sample sizes for couples with inconsistent responses on relationship and sex are small. Because there are separate weights for households in the national versus metropolitan samples, several couples with errors would be dropped from analysis were only one of the weights and its corresponding sample used. All comparative statements in this paper have undergone statistical testing, and, unless otherwise noted, all comparisons are statistically significant at the 95 percent confidence level.<sup>8</sup>

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<sup>6</sup> In preliminary analysis, we looked at mismarks on relationship and sex for the various couple types in greater detail. For couples with sex in error, we assessed which spouse/partner's sex was mismarked, and for couples with relationship mismarked, we looked at their sex composition. However, due to small sample sizes, we were unable to draw conclusions.

<sup>7</sup> In preliminary analysis, we produced separate models for each of the four couple types. However, due to small sample size for some couple types, we instead used couple type as an independent variable in the final models.

<sup>8</sup> Methodological documentation—including information on sample design and weighting—needed to assess the statistical uncertainty of the information is accessible at the AHS methodology website (<http://www.census.gov/programs-surveys/ahs/tech-documentation/ahs-definitions--errors--historical-changes--and-sample-design--.html>).

## RESULTS

### What: Errors on Relationship Versus Sex

In order to provide some context for the issue of relationship-sex inconsistency, we calculated the inconsistency rate across all coupled households from the test panel. A tiny minority of coupled households, at 1.2 percent, has conflicting responses on relationship status and couple members' sexes. Further, this rate does not differ statistically for those responding by telephone compared with those responding via personal visit.

Table 1, which contains information extracted from Lofquist and Lewis (2014), displays relationship-sex inconsistency by couple type. As noted previously, inconsistency in reports of relationship and sex is more common for couples reported as same-sex on the relationship item, especially married same-sex couples, than for those reported as opposite-sex. Thus, although this issue is rare among all coupled households, relationship-sex inconsistency appears to have a substantial impact on same-sex married couples, as 55.9 percent of them has conflicting responses.

**Table 1. Inconsistency in Reports of Relationship and Sex, by Couple Type**<sup>1</sup>

	Number or Percent	Standard Error of Percent
<b>Total same-sex married couples</b>	<b>213</b>	
Consistent	42.3	3.4
Inconsistent	<b>55.9</b>	<b>3.4</b>
One or both missing	1.9	0.9
<b>Total same-sex unmarried couples</b>	<b>237</b>	
Consistent	86.9	2.2
Inconsistent	<b>12.7</b>	<b>2.2</b>
One or both missing	0.4	0.4
<b>Total opposite-sex married couples</b>	<b>27,108</b>	
Consistent	99.1	0.1
Inconsistent	<b>0.6</b>	<b>Z</b>
One or both missing	0.3	Z
<b>Total opposite-sex unmarried couples</b>	<b>2,851</b>	
Consistent	98.1	0.3
Not consistent	<b>1.8</b>	<b>0.3</b>
One or both missing	0.1	Z

<sup>1</sup> The results presented use unweighted data and may not fully account for the sample design. For this reason, some results could relate to the sample design.

Z Rounds to zero.

Source: U.S. Census Bureau, American Housing Survey, 2013. Extracted from Lofquist and Lewis (2014).

Results from a comparison of reported and probable sex for the four types of couples—reported same-sex married, same-sex unmarried, opposite-sex married, and opposite-sex unmarried—appear in Table 2. Looking first at couples reported as same-sex married on the relationship item, we see that 119 of these couples had opposite sexes marked on the sex item. We could not determine probable sex for 11 (9.2 percent) of these couples using the 2010 Census names directory. For an additional 26 (21.8 percent) of these couples, we could not discern probable sex due to name ambiguity.

Of the 82 reported same-sex married couples for whom we could determine probable sex, none were judged to be same-sex couples, meaning that the sex item was incorrectly marked. Indeed, all 82 couples were found to be opposite-sex couples based on probable sex, suggesting the relationship item was mismarked. Thus, relationship-sex inconsistency for reported same-sex married couples is driven by errors on relationship rather than sex. That is, these inconsistent cases are due to opposite-sex couples whose relationship is incorrectly recorded as ‘Same-sex husband/wife/spouse.’

**Table 2. Probable Sex of Couples with Inconsistent Reports on Relationship and Sex<sup>1</sup>**

	Number	Percent	Standard Error of Percent
<b>Total reported same-sex married couples with inconsistent sex</b>	<b>119</b>	<b>100.0</b>	
At least one member lacks value for probable sex	11	9.2	2.7
At least one member has ambiguous name	26	21.8	3.8
<i>Subset of couples for whom probable sex can be determined</i>	82	100.0	
Probable sex is same-sex	0	0.0	0.0
Probable sex is opposite-sex	82	100.0	0.0
<b>Total reported same-sex unmarried couples with inconsistent sex</b>	<b>30</b>	<b>100.0</b>	
At least one member lacks value for probable sex	5	16.7	6.8
At least one member has ambiguous name	4	13.3	6.2
<i>Subset of couples for whom probable sex can be determined</i>	21	100.0	
Probable sex is same-sex	5	23.8	9.3
Probable sex is opposite-sex	16	76.2	9.3
<b>Total reported opposite-sex married couples with inconsistent sex</b>	<b>156</b>	<b>100.0</b>	
At least one member lacks value for probable sex	30	19.2	3.2
At least one member has ambiguous name	20	12.8	2.7
<i>Subset of couples for whom probable sex can be determined</i>	106	100.0	
Probable sex is same-sex	15	14.2	3.4
Probable sex is opposite-sex	91	85.8	3.4
<b>Total reported opposite-sex unmarried couples with inconsistent sex</b>	<b>52</b>	<b>100.0</b>	
At least one member lacks value for probable sex	6	11.5	4.4
At least one member has ambiguous name	10	19.2	5.5
<i>Subset of couples for whom probable sex can be determined</i>	36	100.0	
Probable sex is same-sex	26	72.2	7.5
Probable sex is opposite-sex	10	27.8	7.5

<sup>1</sup> The results presented use unweighted data and may not fully account for the sample design. For this reason, some results could relate to the sample design.

Source: U.S. Census Bureau, American Housing Survey, 2013.

Turning to couples reported as same-sex unmarried on relationship, 30 of these couples were marked as opposite sexes on the sex item. Of these 30 couples, in 5 (16.7 percent) at least one member lacked a value for probable sex, and in another 4 (13.3 percent) at least one member had an ambiguous name. Looking at the remaining 21 couples with information on probable sex, 5 (23.8 percent) of these couples were likely same-sex, meaning that misreporting occurred on the sex item. The other 16 (76.2 percent) couples were judged to be opposite-sex based on probable sex, meaning that the relationship item was misreported. These results indicate that this particular inconsistency, whereby a couple is marked as same-sex partners on relationship but has opposite sexes marked, is caused by mistakes on

both the relationship and sex item, although mistakes on relationship occur about three times as often as those on sex.

Looking next at couples whose relationship was reported as opposite-sex married, 156 were reported as being of the same sex. Among this subgroup, 30 (19.2 percent) couples contained at least one member lacking a value for probable sex, and in another 20 (12.8 percent) at least one member had an ambiguous name. Focusing on the 106 couples with information on probable sex, 15 (14.2 percent) were judged to be same-sex couples, indicating a mistake on the relationship item. The remaining 91 (85.8 percent) couples appear to be opposite-sex, meaning the sex item was misreported. Thus, in cases where a couple's relationship is recorded as opposite-sex married but same sexes are marked, the mismatch occurred on the sex item in a large majority of cases.

Finally, there were 52 couples who were recorded as opposite-sex unmarried on relationship but had same sexes marked. Of these couples, 6 (11.5 percent) contained at least one member lacking a value for probable sex. In another 10 (19.2 percent) couples, at least one person had an ambiguous name. Looking at the remaining 36 couples with information on probable sex, 26 (72.2 percent) appear to be same-sex couples, indicating the relationship item was misreported. The other 10 (27.8 percent) couples were judged to be opposite-sex using information on probable sex. These results suggest that this specific inconsistency, in which a couple's relationship is reported as opposite-sex unmarried but same sexes are marked, is due to mismatches on both the relationship and sex item. However, misreporting on relationship occurs about three times as frequently as misreporting on sex.

### **Who: Which Couples are Mismatched**

*Inconsistent versus Consistent.* In addition to describing couples' mismatches on relationship and sex, information on the characteristics of couples with mismatches is also useful. Table 3 presents results from the logistic regression testing the likelihood of couples having inconsistent reports on the relationship and sex items against having consistent reports. When looking at individual characteristics, we assess the traits of the household respondent, as this was the household member playing the largest role in reporting information.<sup>9</sup>

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<sup>9</sup> The householder was the respondent for 75.3 percent of couples.

**Table 3. Logistic Regression Predicting Couples' Likelihood of Inconsistent Reports on Relationship and Sex**<sup>1</sup>

	Estimate	Standard	
		Error	Odds Ratio
<b>Reported relationship type</b> ( <i>reference category is opposite-sex married</i> )			
Same-sex married	5.4972 ***	0.17	244.00
Same-sex unmarried	3.3471 ***	0.22	28.42
Opposite-sex unmarried	0.9775 ***	0.18	2.66
<b>Respondent age</b> ( <i>reference category is 45 to 54 years</i> )			
15 to 24 years	-0.8537 *	0.36	0.43
25 to 34 years	0.1575	0.19	1.17
35 to 44 years	-0.0511	0.19	0.95
55 to 64 years	0.2295	0.20	1.26
65 years and older	0.2036	0.22	1.23
<b>Respondent Hispanic or Latino</b> ( <i>reference category is not Hispanic or Latino</i> )	0.2448	0.18	1.28
<b>Respondent foreign-born</b> ( <i>reference category is native-born</i> )	0.0308	0.18	1.03
<b>Respondent education</b> ( <i>reference category is high school graduate</i> )			
Less than high school	0.2093	0.23	1.23
Some college or associate's degree	-0.0778	0.17	0.93
Bachelor's degree or more	-0.0372	0.16	0.96
<b>Number of people in household</b> ( <i>reference category is 2 people</i> )			
3 people	0.5450 ***	0.16	1.73
4 people	0.2800	0.18	1.32
5 or more people	0.4233 *	0.20	1.53
<b>Returning household</b> ( <i>reference category is nonreturning household</i> )	-0.7138 ***	0.14	0.49
<b>Intercept</b>	-5.2175 ***	0.22	
<b>N</b>	30,240		

<sup>1</sup> The results presented use unweighted data and may not fully account for the sample design. For this reason, some results could relate to the sample design.

Significance is noted at the following: \*( $p < 0.05$ ); \*\*( $p < 0.01$ ); \*\*\*( $p < 0.001$ ).

Source: U.S. Census Bureau, American Housing Survey, 2013.

Looking first at the effect of reported relationship type, compared with couples reported as opposite-sex married on the relationship item, inconsistent responses are more likely for reported same-sex married, same-sex unmarried, and opposite-sex unmarried couples. These results confirm the pattern observed in Table 1 above, in which inconsistent reports are most common for reported same-sex married couples, followed in order by same-sex unmarried, opposite-sex unmarried, and opposite-sex married couples. Couples marked as having an opposite-sex unmarried relationship are 2.7 times as likely as reported opposite-sex married couples to have inconsistent responses on relationship and sex.

The odds of inconsistent reporting are still higher among reported same-sex unmarried couples (28.4) and particularly those whose relationship was recorded as same-sex married (244.0).

Age is another factor related to the likelihood of having inconsistent reports. Couples in households with a young respondent are less likely to have inconsistent responses on relationship and sex. Compared with respondents aged 45 to 54 years, couples with a respondent aged 15 to 25 years are 57 percent less likely to have inconsistent reports.

Household size also relates to inconsistent reporting on relationship and sex. The odds of having inconsistent reports are 73 percent higher for couples in 3-person households, compared with those in 2-person homes. Inconsistent reports are also more likely for couples in households with 5 or more members, and the size of the effect is not statistically different from that for 3-person households. However, this relationship is not observed for couples residing in 4-person households. Because the AHS asks a number of demographic items, including relationship to householder and sex, of all household members, the survey instrument grows in tandem with the household. For larger households, it becomes easier for the respondent or interviewer to confuse which household member a question is asking about, consequently increasing the chances of misreporting.

Finally, couples in returning households are less likely than those in nonreturning households to have inconsistent reports on relationship and sex. The odds of inconsistent reporting for couples in returning households are about half as much as the odds for couples in nonreturning households. This suggests that dependent interview is a useful tool for reducing reporting errors.

*Misreported Sex and Misreported Relationship versus Consistent.* Above, we explored characteristics associated with couples having inconsistent versus consistent reports on relationship and sex. Here, we break inconsistent reports down further to assess the likelihood of specific reporting errors. Table 4 presents results from the multinomial logistic regression testing the odds of misreporting sex and misreporting relationship against having consistent reports.

Focusing first on the odds of having sex misreported versus having consistent reports on relationship and sex, we see an association with reported relationship type. Compared with couples recorded as being in an opposite-sex married relationship, those reported as same-sex unmarried are 5.5 times as likely to have an error on the sex item. This means that these couples were recorded as same-sex unmarried on relationship but marked as opposite sexes on sex, and were determined to be same-sex using information on probable sex. The odds of misreporting sex do not differ statistically for

couples marked as same-sex married or opposite-sex unmarried on relationship, compared with reported opposite-sex married couples.

**Table 4. Multinomial Logistic Regression Predicting Couples' Likelihood of Misreporting Sex and Misreporting Relationship <sup>1</sup>**

	Misreported Sex versus Consistent Reporting			Misreported Relationship versus Consistent Reporting		
	Estimate	Standard Error	Odds Ratio	Estimate	Standard Error	Odds Ratio
<b>Reported relationship type</b> ( <i>reference category is opposite-sex married</i> )						
Same-sex married	-11.0933	397.40	Z	7.5755 ***	0.30	1000.00
Same-sex unmarried	1.6984 ***	0.48	5.47	5.2254 ***	0.37	185.93
Opposite-sex unmarried	-0.2815	0.35	0.76	2.7063 ***	0.34	14.97
<b>Respondent age</b> ( <i>reference category is 45 to 54 years</i> )						
15 to 24 years	-0.5501	0.63	0.58	-2.0880 **	0.80	0.12
25 to 34 years	0.1449	0.30	1.16	-0.1631	0.33	0.85
35 to 44 years	-0.3259	0.34	0.72	-0.1586	0.31	0.85
55 to 64 years	0.4090	0.29	1.51	0.2076	0.35	1.23
65 years and older	-0.4748	0.38	0.62	0.9791 **	0.37	2.66
<b>Respondent Hispanic or Latino</b> ( <i>reference category is not Hispanic or Latino</i> )						
	0.3911	0.29	1.48	0.1248	0.32	1.13
<b>Respondent foreign-born</b> ( <i>reference category is native-born</i> )						
	-1.0300 *	0.41	0.36	0.0673	0.36	1.07
<b>Respondent education</b> ( <i>reference category is high school graduate</i> )						
Less than high school	0.7053	0.36	2.02	0.4923	0.41	1.64
Some college or associate's degree	0.0697	0.29	1.07	0.3058	0.29	1.36
Bachelor's degree or more	0.1909	0.27	1.21	-0.1011	0.30	0.90
<b>Number of people in household</b> ( <i>reference category is 2 people</i> )						
3 people	0.1836	0.24	1.20	0.3915	0.31	1.48
4 people	-0.5930	0.34	0.55	0.8979 **	0.32	2.46
5 or more people	-0.3321	0.35	0.72	1.2398 ***	0.33	3.46
<b>Returning household</b> ( <i>reference category is nonreturning household</i> )						
	-2.0397 ***	0.34	0.13	0.2662	0.22	1.31
<b>Intercept</b>	-5.1670 ***	0.33		-8.2571 ***	0.44	
<b>N</b>	30,130					

<sup>1</sup> The results presented use unweighted data and may not fully account for the sample design. For this reason, some results could relate to the sample design.

Z Rounds to zero.

Significance is noted at the following: \*(p<0.05); \*\*(p<0.01); \*\*\*(p<0.001).

Source: U.S. Census Bureau, American Housing Survey, 2013.



A second demographic factor related to the risk of mismarking sex is respondent nativity. Couples are 63 percent less likely to have sex misreported when the respondent is foreign-born versus native-born. Recall that the analytic sample excludes couples who were interviewed in a language other than English, so this nativity effect is independent of interview language.

Finally, whether a household was a returning household is associated with the probability of marking a couple's sex in error. Misreporting sex is less likely for couples in returning households. Having an error on the sex item is 87 percent less likely for couples in returning versus nonreturning households. This is consistent with the operation of dependent interviewing in the AHS. For members of returning households, information on sex was copied from a previous wave.

Turning to the results for the odds of misreporting relationship against having consistent reports, we see significant and substantial effects for reported relationship type. Compared with couples reported as having an opposite-sex married relationship, all other reported types—same-sex married, same-sex unmarried, and opposite-sex unmarried—are more likely to have had their relationship mismarked. This association is particularly strong for couples reported as being in a same-sex married relationship, who are 1,000 times as likely as reported opposite-sex married couples to have the incorrect relationship marked. Thus, consistent with our findings from frequency distributions of probable sex, there is a high probability that couples marked as having a same-sex married relationship are actually opposite-sex couples whose relationship was mismarked. The odds of misreporting relationship are also greater for couples reported as having a same-sex unmarried (185.9) or opposite-sex unmarried (15.0) relationship.

Reinforcing the findings for the likelihood of having inconsistent versus consistent responses on relationship and sex, respondent age is associated with the odds of misreporting relationship. Couples with respondents in the youngest age group, 15 to 24 years, are 88 percent less likely than those with respondents aged 45 to 54 to have relationship mismarked. In contrast, the likelihood of having an error on the relationship item is greater when the respondent is 65 or older (2.7). These age differences likely relate to how familiar different generations are with same-sex relationships and related terminology. Because legal recognition of same-sex marriage only began in 2004 in the United States, same-sex marriage did not garner much attention during much of the life spans of older Americans. In contrast, same-sex marriage has been a key issue during the formative years of young adults.

A third factor related to the chance of couples being misreported on relationship is household size. Couples in 4-person homes, compared with those in 2-person households, are 2.5 times as likely to have relationship mismarked. The likelihood of having an error on relationship is also greater among households with 5 or more members (3.5). Recall that the AHS instrument is longer and more complex for larger households. In these longer interviews, the respondent or interviewer may be more likely to confuse which household member a question is asking about. It is also possible that respondents become disengaged in longer interviews, or for the interviewer to go through the instrument more quickly. In these ways, longer interviews can lead to more reporting errors.

## **CONCLUSION**

The Census Bureau strives to measure household and family relationships in a way that accurately captures the complexity of and shifts in American family life. As same-sex couples have gained greater recognition in recent years, the need for quality estimates of these couples has increased. Currently, most Census surveys capture same-sex households indirectly using information on relationship and sex from two separate questionnaire items. Census researchers have developed a revised relationship question that also captures couples' sex composition. Preliminary results from tests of the revised item show that the new item alone does not eliminate errors in estimates of same-sex couples (Lofquist and Lewis 2014). A particularly thorny issue is relative group size, in which estimates of same-sex couples, particular same-sex married couples, are inflated by opposite-sex couples who are misreported as same-sex (Cortina and Festy 2014; O'Connell and Feliz 2011).

In this paper, we used 2013 AHS data using the revised relationship question to conduct a detailed examination of inconsistency between couples' reports of relationship (i.e., same-sex married, same-sex unmarried, opposite-sex married, or opposite-sex unmarried) and their reported sex. We delineate the what and who of relationship-sex inconsistency. Analysis comparing reported and probable sex indicates that the relationship item is mismarked more frequently than sex. Misreports on relationship explain relationship-sex inconsistency for the majority of couples whose relationship was reported as same-sex married, same-sex unmarried, or opposite-sex unmarried. However, errors on sex are more often responsible for inconsistent reports among couples marked as being in an opposite-sex married relationship. Because opposite-sex married couples are the most numerous couple type, errors on sex explain relationship-sex inconsistency for a substantial minority of couples overall.

These findings are generally consistent with the statistical issue of relative group size. Couples with inconsistent reports on relationship and sex more frequently belong to the more numerous group—opposite-sex couples—than to the smaller group—same-sex couples. The exception is for couples marked as opposite-sex unmarried on relationship but as same-sex on sex, who are actually same-sex in the majority of cases. In addition, our findings confirm previous research indicating that estimates of same-sex couples, particularly same-sex married couples, are inflated by errors on the part of opposite-sex couples (Banens 2013; Lofquist and Lewis 2014; O’Connell and Feliz 2011).

Regarding which couples are more likely to have errors made on the relationship or sex items, we find inconsistent reports to be most common for couples whose relationship was reported as same-sex married, followed in order by reported same-sex unmarried, opposite-sex unmarried, and opposite-sex married couples. This pattern is consistent with the findings of Lofquist and Lewis (2014). The same pattern holds for errors specific to the relationship item. Once more, this points to the importance of relative group size, as smaller groups are impacted more by mismarks on relationship.

Respondent age, household size, and whether a household is a returning household are also key factors for relationship-sex inconsistency. Respondent nativity has a limited impact, and Hispanic origin and education are unrelated to inconsistencies. Older respondents are associated with mismarks on relationship. It is likely that older respondents are more apt to make mistakes on the revised relationship question due to lower levels of familiarity with issues and terminology pertaining to same-sex couples. Indeed, for much of their lives, same-sex marriage was peripheral to mainstream politics and culture. Also in line with this reasoning, both relationship-sex inconsistency and misreports on relationship are less likely for younger respondents.

Larger households were found to correlate both with higher odds of relationship-sex inconsistency in general and misreported information on relationship in particular. Instrument operation and length likely account for the positive relationship between household size and relationship errors. In the AHS, demographic items including relationship to householder are asked of all household members. In consequence, larger households have longer instruments, increasing the chance that the respondent or interviewer could confuse which household member the present question is referring to. Longer instruments can also lead respondents to become disengaged or for the interviewer to progress more quickly through the instrument, thereby contributing to reporting errors.

Couples in returning households are less likely to have inconsistent responses on relationship and sex, and are also less likely to have misreports on sex. This suggests that the use of dependent interviewing in the AHS reduces errors as intended. Because information on sex but not relationship was copied for members of returning households, dependent interviewing specifically lessened the likelihood of misreporting on sex.

Although the current study provides useful information regarding the what and who of relationship-sex inconsistencies, it is not without shortcomings. The 2013 AHS has a large sample size, necessary for studying small groups such as same-sex married couples. Despite this, however, the size of groups being analyzed became smaller as we split them in various ways, including by misreporting type (sex versus relationship item). These finer groups offer less statistical power for analysis. For example, regression using larger samples of couples misreporting on sex and relationship may yield additional or stronger relationships between misreporting and couple characteristics. In addition, we were limited in terms of analytic detail. For instance, small group size prevented us from assessing whether the characteristics related to relationship-sex inconsistency differ for various types of couples. We suggest that, if and when possible, our research be repeated using a still larger survey sample in order to confirm and expand our results.

A second weakness of our study is that we cannot distinguish between misreporting on the part of respondents and mismarks made by interviewers. That is, we are uncertain whether reporting errors arise from the answers respondents provide or what the interviewers record. To better tackle this issue, we suggest that future research on relationship-sex misreporting use a survey that collects data through both self-administered and interviewer-administered modes. Because self-administered modes are free from interviewer effects, comparing the two types of data collection would provide more information on respondent versus interviewer effects. Results from the 2014 Census Test will allow such a comparison. In addition, future research could use multilevel modeling to help isolate interviewer effects.

Limitations are inherent in our use of the statistical names directory and the 95 percent rule to determine probable sex and whether relationship or sex was reported in error. As noted earlier, using this method we were able to determine probable sex for only 68.6 percent of couples with inconsistent reports on relationship and sex. Conclusions may differ if a less stringent threshold was used to determine probable sex, or if an alternate method, such as administrative records, was used to verify sex.

One benefit afforded by the revised relationship question is the allowance, in the case of automated instruments, of soft edits that detect inconsistencies and potentially correct misclassifications during data collection. Our current discussion of misreporting does not account for the impact of the soft edits that appeared to interviewers in situations where an inconsistency between relationship and sex was recorded. In future research, we plan to assess the effectiveness of the AHS soft edits in reducing inconsistencies and correcting errors on relationship and sex. Another topic worthy of future analysis is the characteristics associated with resolving relationship-sex inconsistencies through the soft edits. It could also be worthwhile to explore whether error could be further reduced by making the soft edits hard edits, meaning that inconsistencies would need to be resolved in order for the instrument to proceed.

Our results suggest a few steps that can be taken to decrease inconsistency on the relationship to householder and sex items. One possible venue would be to educate interviewers about the issue of relative group size and its relevance for estimating same-sex couples. Interviewers could be prepared to ensure that respondents understand the revised relationship item and to answer questions about the categories for opposite-sex husband/wife/spouse, opposite-sex unmarried partner, same-sex husband/wife/spouse, and same-sex unmarried partner. This is particularly important for older respondents.

A second suggestion is to educate interviewers about data quality issues associated with longer surveys for larger households, and to provide them with strategies to mitigate these issues. This action would likely contribute to improved quality for a number of items across a variety of subject areas, in addition to relationship measurement.

A final suggestion is to continue using dependent interviewing on sex in order to reduce errors on this item and mitigate relationship-sex inconsistency. It is also possible that dependent interviewing on the relationship item would further mitigate inconsistency by decreasing errors specific to this item, although this would need to be tested.

The current research marks a substantial step in the process to improve measurement of household relationships, particularly same-sex married couples. Although a revised relationship question has decreased measurement error (Lofquist and Lewis 2014), inconsistent responses on relationship and sex remain an issue. By providing detailed information on the nature of relationship-sex

inconsistencies, our research will enable us to develop additional avenues for mitigating error, and lead to improved estimates of same-sex couples.

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