Measurement Error in the Relationship Status of Same-Sex Couples in the 2009 American Community Survey

Matt Virgile[1]

U.S. Census Bureau
Matthew.Virgile@census.gov

"Half of that's true [partner], but the other half [unmarried] isn't."
– Washington, DC-based male couple in a domestic partnership[2]

Abstract

In the American Community Survey, same-sex couples living together may describe their relationship as either "husband or wife" or "unmarried partner." Some of these couples report their relationship differently from others, despite living in the same objective conditions. Past literature finds that how same-sex couples define and report their relationship depends on both legal and sociological factors; as a result, far more same-sex couples report their relationship as "husband or wife" than are legally married. Using 2009 ACS 1-year internal data and logistic regression we test three hypotheses: same-sex couples are more likely to report as "husband or wife" (as opposed to "unmarried partner") when they (1) reside in a state recognizing same-sex marriage, (2) live with their own children, and (3) respond to the initial mailout form.

Introduction

The enumeration of same-sex couples in the United States has a complex history at the U.S. Census Bureau. In the 1990 Census, at a time when no legal unions existed for same-sex couples, the term "unmarried partner" was added as a response option to a question about a person's relationship to the head of the household, or 'Person 1.' This became a new way to classify both same-sex and opposite-sex cohabitating couples besides those who identified as "husband or wife" (who presumably were in a legal marriage). In the editing process for the 1990 Census, however, same-sex couples who reported themselves as spouses were enumerated as opposite-sex couples. More specifically, if a person's relationship to 'Person 1' was reported as "husband or wife" and both persons reported the same sex, then the sex of the respondent who reported being the spouse of 'Person 1' was edited to the opposite sex (O'Connell & Lofquist, 2009). Only those same-sex couples who reported themselves as "unmarried partner" were enumerated as reported; a total of 145,130 same-sex couples used the unmarried partner designation in the 1990 Census (U.S Census Bureau, 1993).

During the next decade, various forms of unions for same-sex couples became legal for the first time. In 1993, the Hawaii Supreme Court allowed same-sex couples the right to marry. The ruling was subsequently overturned, however, and in 1996 Congress passed the Defense of Marriage Act (DOMA) preventing Federal recognition of same-sex marriage:

> *"In determining the meaning of any Act of Congress, or of any ruling, regulation, or interpretation of the various administrative bureaus and agencies of the United States, the word 'marriage' means only a legal union between one man and one woman as husband and wife, and the word 'spouse' refers only to a person of the opposite sex who is a husband or wife."*[3]

In July 2000, just as the 2000 Census was wrapping up, the state of Vermont legalized civil unions, giving same-sex couples all the rights and benefits of marriage. Unlike the 1990 Census (when same-sex spouses were enumerated

[1] Disclaimer: This report is released to inform interested parties of research and to encourage discussion. Any views expressed are those of the author and not necessarily those of the U.S. Census Bureau.
[2] Robins, C., Hicks, W. & Kerwin, J. (2010). "2011 Relationship Survey Focus Groups: Final Report"; Prepared by Westat for the U.S. Census Bureau; May 14, 2010.
[3] For the specifications of the act, see http://thomas.loc.gov/cgi-bin/bdquery/z?d104:HR03396:.

as opposite-sex spouses), in Census 2000 all same-sex couples were counted as "unmarried partners." That is, if a person's relationship to 'Person 1' was reported as "husband or wife" and both persons reported the same sex, then the respondent who reported being the spouse of the householder was changed to "unmarried partner" of the householder. This was done in part to follow the guidelines specified in DOMA. Same-sex couples who used the unmarried partner designation were enumerated as reported; a total of 594,391 same-sex couples were identified in the 2000 Census (Simmons & O'Connell, 2003)[4]. Of this total, 253,000 (43 percent) were originally reported as spouses (O'Connell & Lofquist, 2009).

Why would so many same-sex couples report themselves as spouses when same-sex marriage was not legal anywhere in the nation? O'Connell and Lofquist (2009) bring up four scenarios which could produce this result:

1. Couples who were registered as domestic partners or who were in recognized civil unions might have felt that spouse was the closest category from which to choose.
2. Couples married in religious ceremonies that were not legally recognized may have nonetheless considered themselves married.
3. Couples may have identified themselves as "spouses" for social reasons rather than by legal status – e.g., because they were living together a long time or because they had "spousal" characteristics, like living with their own children or co-owning a home.
4. Couples who are legally married to each other but are of the opposite sex and in which one person miscoded their sex.

Evidence for the third scenario was found in the results of the 2000 Dress Rehearsal, held in 1998 in Sacramento, California and Columbia, South Carolina. Same-sex couples who were older or who had children living with them were more likely to choose "husband or wife" than younger, childless couples. In addition, a seemingly counterintuitive finding was that a clear majority of same-sex couples in South Carolina chose "husband or wife" while a clear majority of those in California chose "unmarried partner" (Fields & Clark, 1999). California has a higher proportion of same-sex households than South Carolina but it does not necessarily follow that this leads to more couples identifying as "husband or wife;" in fact, the opposite may be true.

This geographical disparity was also seen in the 2000 Census. Low percentages of same-sex households selected "husband or wife" on the West coast and in New England, while relatively high percentages were recorded in the central states. This pattern contrasts with the distribution of same-sex households; the West coast and New England area states had relatively high proportions of all couple households composed of same-sex couples (O'Connell & Lofquist, 2009). O'Connell and Lofquist speculate that this pattern of results may have been caused by outreach by the Human Rights Campaign and other gay and lesbian organizations which publicly encouraged same-sex couples to mark their forms by checking the "unmarried partner" category. If this outreach was greater in areas with more same-sex households, then it may have produced the observed pattern.

By the time of the 2010 Census, same-sex marriage was legal in five states (Connecticut, Iowa, Massachusetts, New Hampshire, and Vermont) and in the District of Columbia. Two states (Maryland and New York) recognized same-sex marriages performed in other states. Five states (California, Nevada, New Jersey, Oregon, and Washington) and the District of Columbia provided the equivalent of state-level spousal rights to same-sex couples within the state. Finally, four others (Colorado, Hawaii, Maine, and Wisconsin) provided some statewide spousal rights to same-sex couples within the state (Human Rights Campaign, 2010). Same-sex couples may interpret and answer the Census relationship question based on their legal status. For example, focus groups conducted in 2010 found very little variation among respondents who shared the same legal status. Same-sex participants who were legally married all selected "husband/wife" and with very few exceptions all others selected "unmarried partner." However, same-sex participants who had no legal relationship recognition and resided in states not recognizing same-sex marriage expressed anger and frustration over the current relationship categories. Many felt that although "unmarried partner" was the "technically correct" option, it was not a fitting term for a committed relationship and served as a reminder of the inability to be legally married (Robins, Hicks, & Kerwin, 2010). The authors caution that emotional factors as well as cognitive elements have a role in the judgment stage of the response process as defined by Tourangeau, Rips, and Rasinski (2000). Thus, these negative reactions suggest the possibility that others in this

[4] There is some controversy regarding how many of these were in fact same-sex couples and not opposite-sex couples in which one person miscoded their sex. This will be discussed later in the Discussion section.

situation might choose the marital options. In addition, the focus groups revealed that the response options were "cognitively challenging" for participants in a legal union other than marriage.

A study at the Williams Institute by Gary Gates (2010) has similar findings. In a survey of same-sex couples, who were recruited lesbian, gay, bisexual, and transgender (LGBT) members of the Harris Online Poll, there was a high degree of consistency between how couples reported their relationship status on the 2010 Census form and their legal marital status in the state where they lived. "Husband or wife" was selected by 78 percent of married couples, 16 percent of couples in civil unions or registered domestic partnerships, and only 3 percent of couples with no legal union (the remainder in each case selected "unmarried partner"). In addition, same-sex couples living in states with some form of legal recognition for same-sex unions were more likely to use "husband or wife." Eighty-nine percent of married same-sex couples in states with marriage recognition chose "husband or wife" versus sixty-two percent of married same-sex couples in states with no recognition. Twenty-four percent of same-sex couples in civil unions or registered domestic partnerships with state recognition chose "husband or wife" versus twelve percent of those without state recognition; for same-sex couples without any legal union, the divide was six percent in states with recognition (either marriage or civil unions/domestic partnerships) versus two percent in states without recognition.

Exactly how same-sex couples report their relationship status is unclear, but clearly many more identify their relationship to their partners as "spouses" in Census surveys than are legally married. According to the Williams Institute, at the end of 2008, approximately 35,000 same-sex couples were legally married within the U.S. and 86,000 couples were in some other legally sanctioned relationship, such as a civil union or registered domestic partnership. However, data from the 2008 American Community Survey (ACS) estimated that nearly 150,000 same-sex couples identified as spouses, more than the number of couples in any form of legally recognized union (Gates, 2009b).

This study seeks to expand the literature on measurement error in the relationship status of same-sex couples by examining the 2009 ACS 1-year estimates. As in previous studies, the influence of state policy regarding same-sex unions (a legal factor) and presence of children in a household (a social factor) will be investigated to explore how same-sex couples choose their relationship status. Unlike previous studies, however, the possibility of a mode or interviewer effect will be investigated as well. One finding from the focus groups study by Robins, Hicks, and Kerwin (2010) was that same-sex couples' use of term to describe their relationship depended on their assessment of the context. "Husband or wife" might be used in a familiar social environment but "partner" might be used in situations deemed less accepting; perhaps same-sex couples feel pressured to select "unmarried partner" when an enumerator is present. In addition, respondents in the ACS are asked to verify the sex of a same-sex "husband or wife" in a follow-up question if the interview is computer-assisted; this practice arguably lowers the possibility of a sex miscode compared to that for respondents in the mailout group (Gates & Steinberger, 2009). The initial hypotheses are that:

1. Same-sex couples residing in states with legal recognition of same-sex marriage are more likely to report as spouses than those in states with recognition of civil unions/registered domestic partnerships or those in states with no recognition of same-sex unions.
2. Same-sex couples living with children are more likely to report as spouses than those not living with children.
3. Same-sex couples responding by mail are more likely to report as spouses than those responding by Computer-Assisted Telephone Interviewing (CATI) or Computer-Assisted Personal Interviewing (CAPI).

Data and Methods

The American Community Survey began in 1996 in a sample of counties across the country but is now conducted in all U.S. counties. Approximately 3 million housing unit (HU) addresses in the U.S. are selected annually from a sampling frame which is derived from the Census Bureau's Master Address File (MAF). Once the sample addresses are selected, a "prenotice letter" is sent to inform the residents of each selected address that they will receive an ACS questionnaire that should be completed and returned promptly. Then, each ACS questionnaire is sent along with a cover letter, a guide to the ACS, a Frequently Asked Questions (FAQ) brochure, and a return envelope. The 2009 ACS questionnaire consists of questions concerning income, education, marital status, age, housing, race, language spoken at home, and military service, and other topics.

Sample addresses can return a completed questionnaire within three months, but those with available phone numbers for which no response is received within one month are sent to Computer-Assisted Telephone Interviewing (CATI) for follow-up. Cases that fail to return a completed mail questionnaire or to complete a CATI interview are eligible for Computer-Assisted Personal Interviewing (CAPI) in the third month; unmailable addresses are also eligible for CAPI. A systematic sample of these eligible addresses is selected for CAPI follow-up (U.S. Census Bureau, 2009). One important difference between the mailed questionnaire and the computer-assisted modes is that the latter contain a "soft edit" which prompts a verification screen to appear when a householder reports another person of the same sex and their relationship as "husband or wife." Respondents in CATI or CAPI who report this are then asked to verify that the reported data are correct. Unfortunately, data from the CATI and CAPI instruments are not available; thus, it is unknown whether couples changed their initial reports after these probes.

The Census Bureau publishes ACS 2009 1-year estimates based on data collected during the year for geographic entities with populations of at least 65,000. Single-year weighting is implemented in three stages. In the first stage, weights are computed to account for differential selection probabilities based on the sampling rates used to select the HU sample. In the second stage, weights of responding HUs are adjusted to account for non-responding HUs. In the third stage, weights are controlled so that the weighted estimates of HUs and persons by age, sex, race, and Hispanic origin conform to estimates from the Population Estimates Program (PEP) of the Census Bureau at a specific point in time (U.S. Census Bureau, 2009).

This analysis uses internal ACS files from the U.S. Census Bureau. While the Bureau provides Public Use Microdata Samples (PUMS) data for the public to use, this data categorizes the relationship status of all same-sex couples as "unmarried partner" through editing. Internal files include a flag indicating which same-sex couples were originally reported as spouses. Files are available at the HU and person level. HU level files contain the data on the predictor variables used in this study – state of residence, presence of own children in the household, and response mode. The person level files contain data on variables needed to define the same-sex couple population – relationship and sex.

Our hypotheses will be tested by a logistic regression model. Relationship status of same-sex couples will be the binary dependent variable ('1' = "husband or wife," '0' = "unmarried partner"). All of our predictor variables will be tested in a single model. States and the District of Columbia will be divided into three categories – those that recognize same-sex marriage, those that recognize civil unions or domestic partnerships, and those that do not recognize any same-sex unions at the time of the survey. States that only recognize out-of-state same-sex marriages (New York) will be included in the first category, as well as those which temporarily allowed same-sex marriage and continue to recognize couples married within the temporary period as married (California). States that changed policy on same-sex unions during 2009 (Iowa, Nevada, Vermont, Wisconsin, and Washington, DC) will be split between categories based on the month in which the policy changed. Presence of own children in the household will be binary, and response mode will be divided into three categories (mailout, CATI, and CAPI). In addition, the sex of the couple, the region of the household (urban[5] vs. rural), and the age of the householder (above or below mean) will be included as binary predictors in our model. The age of the spouse or partner will not be used in modeling since it is highly correlated with the age of the householder, and including both as predictors creates multicollinearity. Weighting will be incorporated into the analysis.

Results

As shown in Table 1 below, in 2009 there were an estimated 581,300 same-sex couple households in the United States, according to the 2009 ACS 1-year estimates. This is lower than the number of same-sex couple households in the 2000 Census or in the ACS prior to 2008 for reasons which will be explored in the Discussion section. More than one in four of these same-sex couples (26.2 percent) reported as "husband or wife" while the remainder (73.8 percent) reported as "unmarried partner." The majority of the couples (61.8 percent) live in states that did not recognize any same-sex unions at the time of the survey, more than one in four (27.1 percent) live in states with

[5] The American FactFinder defines urban as "all territory, population, and housing units in urbanized areas and in places of more than 2,500 persons outside of urbanized areas. 'Urban' classification cuts across other hierarchies and can be in metropolitan or non-metropolitan areas." All cases not classified as urban are classified as rural.
http://factfinder.census.gov/servlet/DatasetMainPageServlet?_program=ACS&_submenuId=datasets_2&_lang=en

marriage recognition, and the remainder (11.1 percent) live in states with recognition of either civil unions or registered domestic partnerships. Approximately one in six (16.7 percent) live with their own children, nearly three in four (73.7 percent) responded to the initial mailout, just over half (51.8 percent) are female, and the vast majority (83.8 percent) live in urban rather than rural areas. The mean age of the householder is 46.6 years, while the mean age of the spouse or partner is 44.7 years.

The 2009 ACS data includes 80 separate replicate weights at the household and person levels that allow users to generate standard error estimates. For population frequencies these are computed in three steps: 1) computing the overall frequency (based on the full sample weight); 2) computing the same frequency for each replicate (using the replicate weight); and 3) summing the squared differences between the replicate estimates and full sample estimate:

$$SE = \sqrt{\frac{4}{80}\sum_{i=1}^{80}(X_i - X_0)^2},$$

where X_0 is the frequency under the full sample weight and X_i is the frequency under replicate weight i.

The standard errors in Table 1 were computed using this procedure. The replicate weights can occasionally take on a negative value due to the addition of the Group Quarters (GQ) population to the full ACS weighting process. Within a weighting cell, GQ estimates were subtracted from population totals, sometimes resulting in negative values for the cell (U.S. Census Bureau, 2007). Thus, all negative values for replicate weights were set to zero before calculating the standard error estimates below.

Table 1. Characteristics of Same-Sex Couple Households (n=581,300)

	n (se)	Percent
Relationship		
"Husband or wife"	152,121 (3,316)	26.17%
"Unmarried partner"	429,179 (5,185)	73.83%
Legal recognition in state of residence		
Same-sex marriage recognized [a]	157,683 (3,247)	27.13%
Civil Unions/Registered Domestic Partnerships recognized [b]	64,378 (2,073)	11.07%
No same-sex unions recognized	359,239 (5,582)	61.80%
Children		
Living with own children	96,786 (2,264)	16.65%
Not living with own children	484,514 (6,097)	83.35%
Mode		
Mailout	428,539 (4,939)	73.72%
CATI	24,692 (1,376)	4.25%
CAPI	128,069 (4,453)	22.03%
Sex		
Male	280,410 (4,293)	48.24%
Female	300,890 (4,529)	51.76%
Region		
Urban	486,880 (5,856)	83.76%
Rural	94,420 (2,568)	16.24%
Age		
Mean Age of Householder	46.6 (0.17)	-----
Mean Age of Spouse/Partner	44.7 (0.17)	-----

Source: 2009 ACS 1-year weighted internal data (using nonnegative replicate weights).
[a] States include CA, CT, MA, NY, DC (Jul.-Dec. '09), IA (Apr.-Dec. '09), and VT (Sept.-Dec. '09).
[b] States include MD, NH, NJ, OR, WA, DC (Jan.-June '09), NV (Oct.-Dec. '09), VT (Jan.-Aug. '09), and WI (Aug.-Dec. '09).

The population of same-sex couple households in Table 1 includes all households in which (1) a person's relationship to the householder is either "husband or wife" or "unmarried partner;" and (2) the person has the same sex as the householder. However, the ACS person level files contain a relationship allocation flag which indicate whether a person's relationship to the householder was assigned or allocated due to missing or inconsistent data (or the sex of either partner was allocated). Of the 581,300 same-sex couple households enumerated, there were 14,207 (2.4 percent) for which this occurred. To ensure that our analysis concerns only same-sex couples "as reported," the flagged cases will be removed for the remaining analysis, slightly reducing our weighted sample size to 567,093 same-sex couple households.

Table 2 shows the coefficients for each of the predictor variables in a logistic regression model to predict the likelihood of same-sex couples reporting as "husband or wife." The reference categories are couples who live in states with recognition of same-sex marriage, those who live with their own children, those who responded to the initial mailout, female couples, those living in urban areas, and those in which the householder is below the mean age (46 or younger). The standard error is given for each coefficient under the complex sample design, along with Wald test statistic values, odds ratios, and probabilities of reporting as "husband or wife" for each predictor. Standard errors under the complex sample design were computed using the successive difference replication method.

Table 2. Logistic Regression Model Parameters in Predicting the Likelihood of Same-Sex Couples Reporting as "Husband or Wife"

Predictor	Coefficient	SE	Wald Stat.	OR	Prob.
Intercept	0.0205	0.00627	10.69*	----	0.55
Legal Recognition in State of Residence					
CUs/RDPs recognized	-0.5519	0.0166	1105.36*	0.576	0.37
No same-sex unions recognized	-0.5444	0.00557	9552.69*	0.580	0.37
Children					
Not living with own children	-1.4772	0.0102	20973.85*	0.228	0.19
Mode					
CATI	-0.2679	0.0131	418.22*	0.765	0.44
CAPI	-0.0516	0.0175	8.69*	0.950	0.49
Sex					
Male	-0.0942	0.00377	624.34*	0.910	0.48
Region					
Rural	0.5117	0.00048	1136444.84*	1.668	0.63
Age of Householder					
47 years old or older	1.0134	0.00173	343138.61*	2.755	0.74

Source: 2009 ACS 1-year weighted internal data (using nonnegative replicate weights and same-sex couple households "as reported").
*p<.01

Based on our findings, all of our predictors are highly significant in predicting the likelihood of same-sex couples reporting as "husband or wife," relative to the respective reference variables. Couples living in states with recognition of same-sex marriage are significantly more likely to report as "husband or wife" than those in states with recognition of civil unions or domestic partnerships ($\chi^2 = 1105.36$) or those in states with no recognition of same-sex unions ($\chi^2 = 9552.69$). Whether or not a couple lives with their own children appears to be the strongest predictor of how they report; those with children are significantly more likely to report as "husband or wife" than those without ($\chi^2 = 20973.85$) and the odds that a couple with children reports this way is over four times greater than the odds for a couple without children (OR = 0.228). Finally, couples responding by mail are significantly more likely to identify as "husband or wife" than those in CATI ($\chi^2 = 418.22$) or CAPI ($\chi^2 = 8.69$). Thus all three of our initial hypotheses turn out to be correct under a logistic regression model.

In addition, female couples are significantly more likely to report as "husband or wife" than male couples ($\chi^2 = 624.34$), and interestingly, couples living in urban areas are significantly *less* likely to report as "husband or wife" than those in rural areas ($\chi^2 = 1136444.84$). Finally, couples in which the householder is above the mean age are

significantly more likely to report as "husband or wife" than those in which the householder is below the mean age ($\chi^2 = 343138.61$).

The R^2-value for the model is 0.9976. While this may seem alarmingly high, a simple logistic regression model using only children as a predictor of reporting as "husband or wife" yields an R^2-value of 0.8884. In addition, a simple model using only age of the householder as a predictor yields an R^2-value of 0.7568. These are both powerful predictors of how couples report their relationship, which is also reflected in cross-tabulations between relationship and children and between relationship and age, respectively. Other simple models using a single predictor from above (either legal recognition, mode, sex, or region) yield R^2-values ranging from 0.3861 (region) to 0.0076 (mode). Furthermore, with the exception of mode, all initial cross-tabulations between a predictor and relationship are consistent with our model in that they are significant in the same direction. Thus, we accept the findings from our model.

Discussion

Overall, our findings are in line with those found in other studies on same-sex couple households. Couples most likely to report as "husband or wife" live in states with recognition of same-sex marriage (Gates, 2010) and are raising children (Fields & Clark, 1999; Gates & Steinberger, 2009). Interestingly an initial cross-tabulation (not presented here) between relationship and mode reveals that the proportion of couples reporting as "husband or wife" is very close under each mode; an additional cross-tabulation between children and mode finds that couples in CATI or CAPI are more likely to be raising children which is consistent with other findings (Gates & Steinberger, 2009). Thus, after controlling for children in our model we find that couples responding by mailout forms are more likely to identify as "husband or wife" than those in CATI or CAPI.

We believe that more couples report as "husband or wife" in states with legal recognition of same-sex marriage than in states without recognition because most couples perceive the relationship question to be asking about legal marital status. Same-sex couples that have been legally married are more likely to live in states in which their marriage is recognized than not (Gates, 2010). It is difficult to draw a solid conclusion as to why same-sex couples with children are overwhelmingly more likely to report as "husband or wife" than those without children. This could be due to any or all of the following: 1) a correlation between legal marital status and child-rearing; 2) couples with children feeling more "spousal-like" regardless of legal marital status; or 3) substantial miscoding of opposite-sex married couples with children as same-sex couples. While there is a good deal of literature on same-sex couples raising children, there is little or no research dividing *legally married* same-sex couples and unmarried same-sex couples with children. We believe that more couples report as "husband or wife" by mail than in CATI or CAPI (after controlling for the differences between respondents in each mode) primarily due to the "soft edit" in the computer-assisted instruments and, although there is no direct evidence of an interviewer effect on reports, the possibility of this would still be valuable to explore in future research.

Our other findings are consistent with those in other studies as well. Female couples are more likely to identify as "husband or wife" than male couples, and older couples are more likely to identify as "husband or wife" than younger couples (Fields & Clark, 1999). In addition, our findings that couples in rural areas are more likely to identify as "husband or wife" than those in urban areas are similar to the findings of Gates and Steinberger (2009); they found that same-sex couples identifying as "husband or wife" were more likely to not be living in a metropolitan area.

Statistics collected in the U.S. since same-sex marriage was first legalized show that the majority of legally married same-sex couples are female, which likely explains why more female couples report as "husband or wife" than male couples. They also show that legally married same-sex couples tend to be older than unmarried same-sex couples; this likely explains our findings that older couples are more likely to report as "husband or wife," as does older couples being more "spousal-like" in that they may have lived together for a long time. Our findings that same-sex couples in rural areas are more likely to report as "husband or wife" than those in urban areas may seem surprising; one possible explanation is offered by Gary Gates of the Williams Institute. Gates finds that child-rearing is most common among same-sex couples in the Southern U.S., and twice as likely among black or Latino same-sex couples than among white same-sex couples. He theorizes that many of these couples entered into their current relationship after first having children in heterosexual relationships and after having dealt with social or religious disapproval of same-sex partnerships (Tavernise, 2011). While Gates only applies this to explain the statistics in same-sex couples

and child-rearing, perhaps it could be extended to say that same-sex couples in rural areas prefer to use the nomenclature of marriage in describing their current relationship.

One limitation of the analysis in this paper is that all households enumerated as same-sex couple households are assumed to actually have a same-sex couple. As mentioned earlier, some of these couples may actually be of the opposite sex in which one person miscoded their sex. Beginning in 2008, ACS included an improved redesign of both the survey and post-data collection editing techniques. These changes reduced the rate of sex miscoding among different-sex spouses. Thus, data from 2008 and 2009 ACS is believed to offer a more reliable estimate for the total number of same-sex couples that is lower than past estimates from ACS and from Census 2000 (Gates, 2009a). However, a study by O'Connell & Feliz (2011) suggests that inflation due to sex miscoding remains a challenging problem. O'Connell and Feliz examined data from the 2010 Census and considered the probability that first names were either male or female based on statistical "name directories" developed at the Census Bureau. Based on this methodology, O'Connell and Feliz project that about 20 percent of the tabulated same-sex couples from 2010 Census mail returns were actually opposite-sex couples; when mail returns were broken down by reported relationship status, 57 percent of reported same-sex spouses and 4 percent of reported same-sex unmarried partners were judged to be opposite-sex couples. The miscode rates for 2009 ACS mail returns may be similar to those for the 2010 Census mail returns, as the mailout forms shared a similar format. It is important to keep this in mind when interpreting our results since the miscode rate in mail returns may be substantially higher for reported same-sex spouses than for reported same-sex unmarried partners.

A few studies have taken different approaches to estimate how many households enumerated as same-sex couple households in either Census 2000 or pre-2008 ACS were in fact opposite-sex couple households. All of them find that the total of same-sex couples was severely inflated due to this error source. One study by O'Connell and Gooding (2006) examined data from the 2004 Census Test in Queens, New York. Using methodology based on "name directories," O'Connell and Gooding project that about 20 percent of the same-sex couple sample in the 2000 Census was made up of opposite-sex couples; however, the sample used in this study is restricted to one area (Queens, New York) and may not be representative of the U.S. population. Another study by Black, Gates, Sanders, and Taylor (2007) used the presence of children in the home to differentiate between same-sex and different-sex couples who reported as "husband or wife," and suggests that as much as 40 percent of the total same-sex couples sample in 2000 (both "spouses" and "unmarried partners") were misclassified different-sex married couples. However, a third study by Gates and Steinberger (2009) argues that the approach by Black and colleagues is flawed due to correlations between child-rearing and how same-sex couples report their relationship status; the Gates and Steinberger analysis finds evidence that child-rearing is highly correlated with the decision to use "husband or wife" to describe a partner (as does this study and others mentioned earlier). Gates and Steinberger examined mailout responses in the 2005-2007 ACS of all reported same-sex couples who used the "husband or wife" designation. They estimate that just over 30 percent of the same-sex couple sample may be misclassified different-sex married couples – higher than the estimate from O'Connell and Gooding but lower than that from Black et al.

Another limitation is that the legal marital status of couples is unknown. Our findings are consistent with those of Gates (2010) in that same-sex couples living in states with marriage recognition are more likely to identify as "husband or wife," but ACS does not provide data on legal marital status unlike Gates' questionnaire or the focus group study by Robins, Hicks, and Kerwin (2010). These studies also highlight considerable measurement error in relationship status of same-sex couples who may have been legally married in one state but currently reside in another state with no recognition of same-sex unions. Gates found that 62 percent of these couples reported as "husband or wife" while the remaining 38 percent reported as "unmarried partner." Robins, Hicks, and Kerwin found that while all legally married same-sex participants marked "husband or wife" regardless of local laws, couples that were presented with a hypothetical scenario about being married in Massachusetts but living in a state where the marriage was not valid gave mixed answers on how they would report. While their data *suggests* that married same-sex respondents would mark "husband or wife" on Census or ACS forms, the discussions introduced the possibility that not all married survey respondents would answer so consistently.

To reduce measurement error in response to the relationship question, the focus group study (Robins, Hicks, and Kerwin 2010) tested various alternative wordings of the question as well as alternative or additional response options and presented them to participants. Based on the findings, a paper by Bates, DeMaio, Robins, and Hicks (2010) makes several recommendations for future testing. These include adding response options such as "civil union partner" or "domestic partner" to reinforce a legal interpretation of the question, as well as including the term

"spouse," either in addition to or instead of, the "husband or wife" category. "Spouse" was viewed favorably by most same-sex couples. It remains to be seen whether these changes and others will be incorporated in future Census surveys and what results they might yield.

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