Examining the Economic Status of Same-Gender Relationship Households

This technical appendix accompanies Examining the Economic Status of Same-Gender Households. This analysis describes the demographics of households, including same-gender relationship households, using national federally-collected survey data: the American Community Survey (ACS) 2015-2019 five-year file. Our analysis looks at prime-aged adults aged 25–54 whom the Census designates as being married or in an unmarried cohabiting coupled household. Using data from the 2015-2019 ACS survey we find that adults in same-gender relationships, particularly men—have different demographic profiles from adults in opposite-gender relationships.

The technical appendix also serves as a primer for those looking to use the ACS identification of same-gender households. We review the history of how the US Census Bureau (Census) has identified same-gender households over time, how other scholars have worked with these data, and what the data looks like since Windsor. In addition to mapping out these changes, we also use new language, opting to use same-gender rather than same-sex as questions asking the respondents sex are really are asking about self-representation (gender) as male or female.

Identifying Same-gender Households in the Decennial Census and ACS from 1990–2013

The 1990 Decennial Census was the first time when researchers could estimate the number of same-gender coupled households who were not just roommates—however— subsequent editing procedures led to measurement errors. Major changes to the measurement and classification of same-gender couples occurred in 1990, 2000, and 2013. While other changes were made throughout this time, these years reflect the largest changes to the editing procedure of the same-gender couple survey data.

In 1990, the Census Bureau adopted an editing process that changed the *gender* of one of the spouses in same-gender couples who reported being married. They assumed that overrepresentation of same-gender married couples in the data was caused by opposite-gender married couples miscoding the gender of their partner. Researchers later noted that although gender miscoding is rare among opposite-gender couples, it was common enough relative to the actual number of same-gender couples to significantly affect the survey results.

Since no states had legalized same-gender marriage due to the Defense of Marriage Act (DOMA), enacted in 1996, the Census changed the editing procedure to correct the relationship status of a couple rather than its gender composition following the 2000 Census. The Census instead edited the *relationship category* of those who self-reported to be a same-gender married couples rather than the gender of the respondent's partner. This procedure was not changed as marriage equality rolled out in states in the intervening period from 2000 to 2013, same-gender married couples were recoded as "unmarried partners," including those who lived in a state that recognized same-gender marriages. Census flagged those records that were changed, but this flag is not publicly available. Following the decision of United States vs. Windsor, same-gender married couples were included in the "*married spouse present*" category.

Starting in 2013, there has been no ex-post editing process that recodes same-gender couples based on gender, sex, or marital status.

History of Same-gender Households Measurement in the Decennial Census and ACS

Hurdles to calculating accurate counts of same-gender couples in the U.S. have been well documented. Starting in 1990, the decennial Census introduced a new relationship type: respondents could describe their relationship with others in the household as an "unmarried partner" without being combined with roommates like in the 1980 Census. The new distinction gave researchers the ability to report the counts of self-identified same-gender households more accurately in a nationally representative dataset (Gates and Steinberger 2009).

Despite the new option, many same-gender couples reported their relationship as married, choosing the "husband/wife" option. During ex-post editing, Census assumed that same-gender married couples represented a miscoding of the gender of the respondents' partner and in most cases made edits to the gender variable—changing the gender of the partner to the opposite gender of the respondent (Demaio et al. 2013). Using this editing procedure, the Census misclassified many same-gender couples as opposite-gender couples (Gates and Steinberger 2009).

Unlike the editing process of the 1990 Census, in the 2000 Census and subsequent ACS surveys, if a household consists of a same-gender married couple then it was assumed that the reported gender was correct and the respondent who reported being the spouse of the head of household was edited to being the unmarried partner of the head of household (Gates and Steinberger 2009; O'Connell and Lofquist 2009). Following this editing procedure, many researchers found that miscoding of opposite-gender partners is rare. Nonetheless, it is common enough and the actual number of same-gender couples is small enough that making no adjustment to the survey leads to an overrepresentation of the numbers of same-gender households (O'Connell and Gooding 2006). Since same-gender coupled households are a small subpopulation, even small percentages of gender miscoding amongst different-gendered households are enough to influence results. At one point, researchers found that nearly a third of the same-gender couples recorded in the 2000 Census were actually opposite-gender couples where spousal gender was miscoded (O'Connell and Feliz 2006). As a result, the editing process in 2000 and subsequent ACs surveys created error in the estimates for same-gendered couples.

The legalization of same-gender marriage began as early as 2004 when Massachusetts became the first state to offer full marriage equality, with other states following over the years; nonetheless, the editing procedure which converted these marriages to partnerships in the ACS remained. The Census continued to ex-post edit the relationship of self-identified same-gender married couples in states that had marriage equality as well as states that did not until DOMA was overturned in 2013. The means that in Census data until 2013 same-gendered couples, regardless of legal marriage status in their state, were edited to become "unmarried partners."

As more states began legalize same gender marraige, Martin O'Connell and Daphne Lofquist studied how ACS estimates of same-gender married couples changed between 2004-2007. To conduct their

analysis, they used a data imputation flag that allowed them to identify who originally reported being a same-gender spouse from those who reported being a same-gender unmarried partner. The data imputation flag was not made publicly available until 2013. O'Connell and Lofquist found there were 341,000 same-gender married couples in the 2007 ACS survey despite there only being 11,000 marriage license issues to same-gender couples in the United States (all from Massachusetts). The numbers of reported same-gender spouses greatly exceeded the counts found in other administrative data. This discrepancy in the administrative data and ACS data led many to conclude that the excess of reporting same-gender spouses was the result of false positive measures from gender miscoding. Others suggest the excess reflects the changes of how same-gender couples view their relationships (Demaio et al. 2013; O'Connell and Lofquist 2009; Robins, Hicks, & Kerwin, 2010).

As noted, documentation shows that gender miscoding affects the estimates of the number of same-gender couples. Researchers widely agree that the number of same-gender couple were previously over-reported because spousal sex was mismarked (Demaio et al. 2013; O'Connell and Gooding 2006; Black et al. 2007; Gates and Steinberger 2009; O'Connell and Feliz 2011). Previous research estimates between 28 and 30 percent of same-gender couple households are likely to be opposite-sex households. Gary Gates and Michael Steinberger find that a miscoding rate of one-quarter of one percent within the different sex married couples sample led to a 30 percent misclassification rate of different sex couples married couples as same-gender couples (Gates -and Steinberger 2009). Additionally, couples in legally recognized relationships similar to marriage, domestic partnerships and civil unions, may have responded to the survey that they were married, as these relationship designations were not an option.

To obtain accurate estimates of same-gender coupled households, specifically same-gender spouses, new editing and data collection changes occurred between 2007 and 2008. These include changing the keying from manual imputation to an electronically captured image, questionnaires from a grid-based design to a direct sequential ordering of items, and householders and spouses who had their gender response altered in the published survey results – which can be examined using the data quality flag— would be recorded as unmarried partners instead of same-gender spouses as they were in 2007. Overall, these improvements made the ACS survey more consistent with the 2010 decennial Census. Following these improvements there was a sharp decline in the number of same-gender households who reported being spouses between the 2007-2008 ACS surveys; the estimates rebounded in the following years (Demaio et al. 2013; O'Connell et al. 2010; O'Connell and Feliz 2011).

To reduce measurement error, Gates proposes a data cleaning procedure that restricts the sample of respondents to only those who submitted responses via CATI/CAPI and proxy identification of the same-gender spouse by using the marital status allocation flag. The survey design of the CATI/CAPI ask respondents who identify as same-gender spouses to re-verify their reported sex. Restricting the sample to CATI/CAPI respondents successfully removes misclassified married and unmarried couples from the initial sample; cancelling out the previous measurement errors (Gates and Steinberger 2009; Gates 2015).

The most recent change to ACS survey data to aid researchers in calculating accurate estimates on the counts of same-gender coupled households was in 2013. In 2013 the United States Supreme Court decided that DOMA was unconstitutional (United States v. Windsor). Following this decision, the 2013 ACS/PRCS included same-gender married couples in the "married spouse present" category, ending the recoding of married same-gender couples to unmarried partners. The Census now allows researchers to separate opposite-sex married/same-gender married and opposite-sex unmarried partners/same-gender unmarried partners.

Data Sources

This study aims to increase our understanding of the different demographic profiles of adults in same-gender and opposite gender co-habiting couples. We expand on works from Glassman 2020 and Taylor 2020 to both describe different demographics of same-gender and opposite-gender couples and test to see how those different demographics are related to household income.

We use data from the American Community Survey 2015-2019 five-year file because it contains data on same-gender couples after the U.S. Supreme Court legalized same-gender marriage in all states (*Obergefell v. Hodges*). Data collected in these years are bettered by data editing improvements that mitigates the prevalence of measurement error among same-gender couples (Black et al. 2007; Gates and Steinberger 2009; O'Connell and Feliz 2011).

Data Collection and Procedures

Because the Census does not ask sexual orientation questions in the ACS survey, adults who are in same-gender relationships can only be measured if they are co-resident in a household. We are therefore only able to identify couple types by the self-reported gender of the respondent and the spouse/co-resident partner as well as the self-reported relationship status of the couple. Through these two questions with construct our gender-by-marital status designations. If the primary respondent stated they were in a same sex married couple, and the sex of the spouse and the primary respondent were the same, we define them as a same-gender married couple. If the primary respondent stated they were in a same sex unmarried couple, and the sex of the spouse and the primary respondent were the same, we define them as a same-gender unmarried cohabitating couple. Although singletons the analysis, we do not know their sexual orientation due to data limitations.

Because we are unable to identify the sexual orientation of individuals within a household, we define same-gender households as households where the gender of the spouse or unmarried partner is the same as the gender of the primary respondent. This data limitation means that we can not categorize a household as *gay* or *lesbian*, thus we define them as same-gender (male) or same-gender (female) households.

Empirical Design

Sample

Building off previous research from Glassman (2020), we restrict the analysis to prime aged households (aged 25–54). This restriction also helps us identity the same-gender couples who were most likely to be married and employed during the study period. Our final ACS weighted sample includes 278,432 men and 304,339 women in same-gender couples, as well as 37 million men and women in different-gender couples. Table 1 reports the distribution of the sample size by couple type, average age, marital status, presence of children education, income, and density. Same-gender couples represent 1 percent of all married couples and 5.3 percent of all unmarried couples in the U.S.

Measures and Model

We use a multiple regression model to test how different household factors are associated with income. To estimate how different couple types are associated with income we use opposite-gender married couple as a baseline as they are the most prevalent couple type, while holding all other characteristics constant. We control for a standard set of household demographic information using data from the ACS: respondent age, marital status, number of children in a household, educational attainment, number of earners, and if they live in a high-density area.

Family Income. The ACS reports household income as the total cash income of all members of household aged 15 or older during the previous year. To ensure we only have the incomes of the primary adult couple in the household, we use the personal income of each respondent to construct the total income of the focal couple, which we call family income. Amounts are expressed in 2019 dollars.

Sex-by-Marital Status. We define eight different couple types which are: opposite-gender married couple, same-gender male married couple, same-gender female married couple, opposite-gender cohabitating couple, same-gender male cohabitating couple, same-gender female cohabitating couple, male singletons, and female singletons.

Summary Table with the Demographics of Households, by Couple Type

	Opposite-Gender Couples		Same-Gender Couples (Male)		Same-Gender Couples (Female)		Singletons	
	Married	Unmarried Cohabitants	Married	Unmarried Cohabitants	Married	Unmarried Cohabitants	Male	Female
Totals	31,059,005	5,180,890	139,407	139,025	169,473	134,866	12,624,790	14,333,797
Average age of adults in household	41	36	42	39	40	38	39	40
Has one more more children in household	75.51%	51.61%	20.86%	7.61%	43.26%	31.99%	13.23%	50.84%
Dual-earner household	78.46%	85.52%	87.64%	92.56%	88.05%	91.67%	—	—
Bachelor's degree or higher	53.89%	37.00%	68.22%	64.72%	62.61%	54.50%	29.56%	33.62%
Lives in high-density area	41.94%	47.45%	59.24%	67.37%	51.19%	53.11%	47.54%	52.57%

Source: U.S. Census Bureau, 2015–2019 American Community Survey 5-year file; authors' calculations.

Note: Totals represent the weighted population totals of prime-aged adults in each group.

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Density. The ACS reports the average local population density among residents in Public Use Microdata Area (PUMA) in persons per square mile. We divide these values into quintiles and define the top quintile as high density.

Education. We construct a variable that assigns to each couple the education of its most highly education member, whether a bachelor's degree or more, some college education, or a high school degree or less.

Dual Earner. Households have two earners if each member of the couple has positive pre-tax income.

Presence of Children. We define presence of children one or more child under the age of 18 being in the household.

Association Between Household Characteritics and Median Family Income

	Martial Status	Marital Status, by Gender	Full Model
Dependent Variable: Family Income			
Independent Variables			
Income-Related			
Some college	13,801***	13,790***	14,529***
	(127.6)	(127.6)	(127.5)
BA+	66,572***	66,536***	67,183***
	(120.8)	(120.8)	(121.4)
Dual earners	32,729***	32,683***	32,941***
	(210.6)	(210.7)	(210.6)
Density	10,578***	10,545***	10,878***
	(110.4)	(110.5)	(110.5)
Kids	2,485***	2,619***	5,812***
	(118.7)	(118.7)	(127.0)
Marital Status and Gender			
Married (all)	32,906***	32,811***	
	(198.9)	(199.0)	
Partnered (all)	11,742***	11,330***	
	(249.8)	(249.4)	
Same gender (all)		8,489***	
		(762.6)	
Same gender, male, married			26,903***
			(1,831)
Same gender, female, married			-10,630***
			(1,147)
Oppsite gender, partnered			-20,887***
			(191.9)
Same gender, male, partnered			10,570***
			(1,850)
Same gender, female, partnered			-26,342***
			(1,073)
Male singletons			-23,064***
			(225.6
Female singletons			-38,339***
			(198.3)
Constant	-115,440***	-115,187***	-81,094***
	(1,180)	(1,179)	(1,189)
Observations	3,041,222	3,041,222	3,041,222
R-Squared	0.286	0.286	0.289

Source: U.S. Census Bureau, 2015-2019 American Community Survey 5-year file; authors' calculations

Note: *** = $p < 0.01$; ** = $p < 0.05$; * = $p < 0.1$. Standard errors are in parentheses.

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