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Updates to Collection and Editing of Household Relationship Measures in the Current Population Survey
Rose M. Kreider and Benjamin Gurrentz

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Abstract

This paper describes the recent changes made to data collection and processing of household relationship data in the Current Population Survey (CPS). Beginning in May of 2015, a revised relationship to householder question, along with gender neutral parent identification questions were phased in, so that all cases had received them for the 2017 Annual Social and Economic Supplement (ASEC). These data collection changes necessitated adjustments to the demographic editing process, which are also described.

Relationship to householder

As a nationally representative household survey, and allowing for historical time series of estimates dating back to 1959, the CPS is useful for examining the changing characteristics of households and the families within them. Households contain members who are either living at the residence at the time of the interview or typically living at the residence but temporarily away for various reasons.[1] Within these households are families, which the Census Bureau defines as a "group of two persons or more residing together and related by birth, marriage, or adoption."

Near the beginning of the interview, we ask how each household member is related to the householder—also called the reference person. This should be someone who owns the home, or whose name is on the lease. Understanding each member's relation to the householder allows us to distinguish households by family type and their unique characteristics.

The Census Bureau made changes to the relationship to householder question in order to address known data quality issues and improve the measurement of same-sex couple households. In reviewing the Census 2010 data, the Census Bureau became aware of a reporting error that affects data quality for same-sex married and unmarried couples. When two groups are related, and a very small proportion of the large group mismarks their answers, this can affect the estimates of the smaller group. This reporting error has the largest effect on the estimates of same-sex married couples, but also affects same-sex unmarried couples. The effect of mismarks on the estimate of same-sex married couple households is substantial.[2] Working in the context of an OMB-led interagency group, Measuring Relationships in Federal Household Surveys (MRFHS), the Census Bureau revised the relationship question to list additional categories and to address these kinds of reporting errors.[3] The new

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[1] For examples of those considered a part of the household roster, please see technical documentation here: https://www2.census.gov/programs-surveys/cps/methodology/intman/Part_C_Chapter3_AtoJ.pdf

[2] For details, see O'Connell, M. and S. Feliz. 2011. Same-Sex Couple Household Statistics From the 2010 Census, SEHSD Working Paper 2011-26, available at: https://www.census.gov/library/working-papers/2011/demo/SEHSD-WP2011-26.html

[3] See the Statistical Working paper published by the OMB-led group, *Improved Measurement of Household Relationships in Federal Surveys: Measuring Same-Sex Co-Residential Relationships*, available at: https://s3.amazonaws.com/sitesusa/wp-content/uploads/sites/242/2014/04/MRFHS_StatisticalPolicyWorkingPaper201408.pdf

relationship categories specify whether the household member is the opposite-sex spouse, opposite-sex unmarried partner, same-sex spouse or same-sex unmarried partner of the householder. Numerous papers and reports detailing investigation of this reporting error and results of quantitative tests of the revised question are posted on the Census Bureau website (https://www.census.gov/topics/families/same-sex-couples.html).

See Figure 1 for the response categories to the relationship question, comparing the previous set with the expanded, updated set. Please note that the legacy categories in the figure are re-ordered to match the updated categories for comparative purposes. The categories of spouse and unmarried partner were expanded to distinguish between opposite-sex and same-sex couples. In addition, the unmarried partner categories are now displayed next to the categories for spouses, which was not the case in the past.

Figure 1. Updating the Relationship to Householder Categories in CPS

Source: U.S. Census Bureau, Current Population Survey, Annual Social and Economic Supplement, 2018
Note: Legacy response categories re-ordered for comparative purposes.

Even with the updated processing, the Census Bureau's definition of family as a "group of two persons or more residing together and related by birth, marriage, or adoption" will remain the same.

Parent identification questions

In 1982, the Census Bureau first introduced a direct question asking all respondents to identify a parent for household members. In 2007, a second parent identification question was added, and respondents were asked to identify the household member's mother, if they reported one was present, and the household member's father, if they reported one was present. This second question allowed the easy

identification of children living with two unmarried parents, whereas in the past, children were identified as living with two parents only if the parent who was identified in response to the parent identification question was married. The recently updated parent identification questions are gender neutral, asking simply if the household member has a parent present, and if so, asking if they have another parent present. This allows respondents to easily report same-sex parents (i.e., two mothers or two fathers). Figure 2 shows the change in the question wording.

Figure 2. Parent Identification Questions
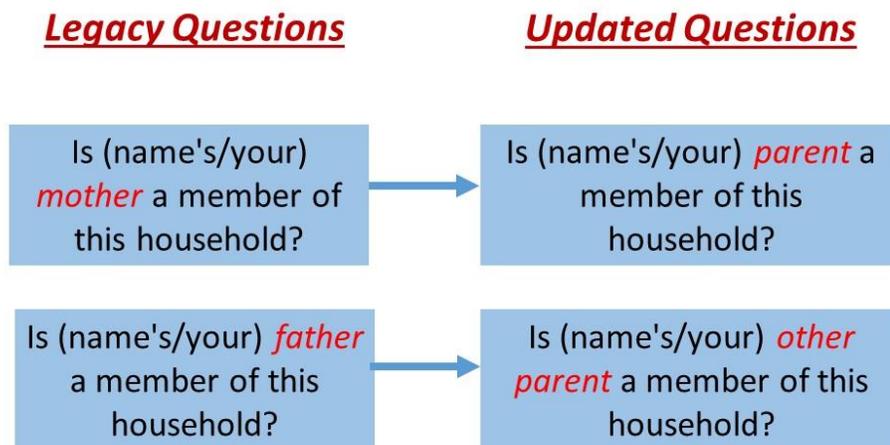
Source: U.S. Census Bureau, Current Population Survey, Annual Social and Economic Supplement, 2018

Implementing the revised questions

The Census Bureau completed implementation of the updated relationship and parent identification questions in the Current Population Survey (CPS). Beginning in May of 2015, the new questions were introduced to incoming sample members. By the time of the Annual Social and Economic Supplement (ASEC) 2017, the entire sample was receiving the new questions. Subsequently, the Census Bureau updated the edits and processing system to incorporate the revised questions. In order to show these updated changes to the collection and editing of demographic data, the Census Bureau re-processed and re-released public use files for the 2017 ASEC (i.e., 2017 ASEC research file) and the 2018 ASEC (i.e., 2018 ASEC bridge file). These files provide users with the ability to see the effects of the revised relationship question, gender neutral parent identification questions, and updated processing system on the data that have already been released to the public using the legacy processing system.[4] The ASEC 2019 production file includes the redesigned questions, and was processed using the updated processing.

Editing the revised relationship question

In the past, the Census Bureau edited those reported as same-sex spouses and showed them as unmarried partners. This is no longer the case. As a result, both same-sex unmarried partners (available in basic CPS since late 1995, and in ASEC since 1996) and same-sex married couples will be categories available on the file through the relationship to householder question.

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[4] The ASEC 2017 research file is available here: https://www.census.gov/data/datasets/2017/demo/income-poverty/2017-cps-asec-research-file.html. The ASEC 2018 bridge file is available here: https://www.census.gov/data/datasets/2018/demo/income-poverty/cps-asec-bridge.html.

Figure 3. Examples of Households with Inconsistent Relationship and Sex Reports
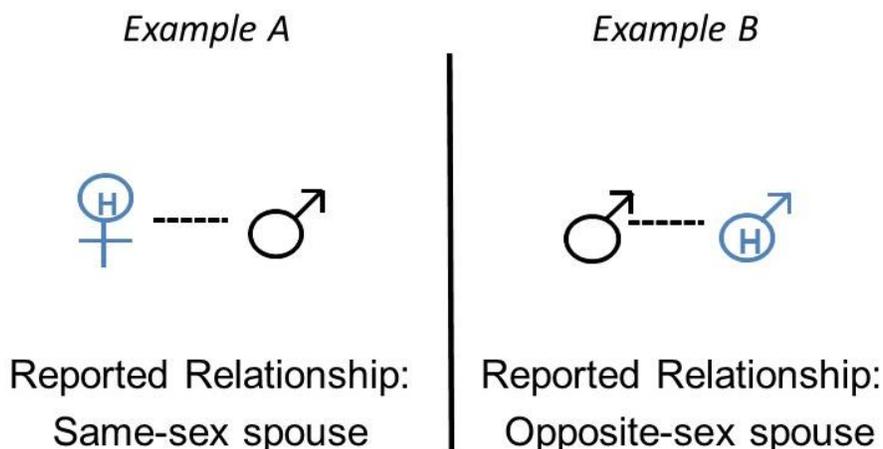
By adding response categories that distinguish opposite-sex and same-sex spouses and unmarried partners, we make it possible to see cases where the reported relationship category is inconsistent with the sex reported for the two members of the couple. This results in some coupled households being 'mismatched.' Figure 3 shows two examples of households in which the relationship and sex reports are inconsistent. In the first (pictured on the left side of Figure 3), a man is reported as the female householder's same-sex spouse. In the second (pictured on the right), both people are reported as male, but 'opposite-sex spouse' is reported as the relationship category. These types of inconsistent reports are mainly due to inadvertent mistakes, but likely also reflect some cases in which transgender people have made do with the limited sex response categories that are available on the survey. The editing process creates consistency between the relationship and sex reports.

The rationale for resolving these inconsistencies in CPS is based on data from the largest test conducted in the decennial program—the 2015 National Content Test (NCT).[5] The test was nationally representative, with a sample of about 1.18 million households. It employed a split panel design for the relationship question, allowing comparisons of the control and test questions. The test included paper, internet, and Telephone Questionnaire Assistance (TQA) modes. Nonresponse follow-up was not included in the 2015 NCT. The results were weighted using a basic household weight. The internet instrument contained an automated check, which was triggered when the reported sex values for the householder and their spouse or partner did not agree with the relationship value chosen (e.g., both the householder and their spouse or partner were reported as male and their relationship was reported as opposite-sex). For those respondents who made a change using this automated check, the largest group changed the sex of the spouse.[6]

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[5] For the report detailing the test of the relationship question, see: https://www2.census.gov/programs-surveys/decennial/2020/program-management/final-analysis-reports/2015nct-relationship-question-experiment.pdf

[6] See Figure 17 in the figures accompanying the working paper found at this link: https://www.census.gov/library/working-papers/2017/demo/SEHSD-WP2017-28.html

To decide which inconsistent reported value to change—relationship, sex of the householder, or sex of the spouse/partner, we analyzed the 2015 National Content Test (NCT) data, matching a names index to those data. The names index specifies a value for first names that indicates how often that name is reported as male. This value can be used to assign a sex value when respondents have failed to report one, or it is inconsistent with other reported information. We evaluated the accuracy of using this first name index by matching Census 2010 and ACS 2010 data to Social Security data and comparing the sex value reported in our survey data with the value on the Social Security record, which we assumed to be the true value.[7] This allowed an examination of the cases with inconsistent relationship and sex reports, to see what sex values were implied by the reported first names. Assuming that only those with names reported as male or female 95 percent of the time could be assigned a sex, we found that the majority (61 percent) of those couples were opposite-sex couples. Based on earlier work, we expect that roughly 85 percent of adults have a name that is reported as male or female 95 percent of the time. In order to include another smaller group of adults whose names are not reported male or female quite as often, we relax the stringent assumption that the name must be reported male or female 95 percent of the time to 80 percent of the time. Doing this in the NCT data, we found that 70 percent of the couples with mismatched relationship and sex reports were opposite-sex couples.

Knowing that the largest piece of the mismarking problem is opposite-sex couples who mistakenly end up reporting as same-sex couples, we use these data from NCT to inform our editing decisions in CPS. For CPS, in cases where the relationship and sex reports are inconsistent, we use an algorithm that randomly assigns cases as opposite-sex couples 70 percent of the time, and same-sex couples 30 percent of the time, by editing either the relationship to householder response or the sex of one of the members of the couple. Census 2020 and ACS 2019 data will allow us to evaluate whether this is the best way to handle these inconsistent cases, since we need to use decennial and ACS data as the benchmark for the relatively small population of same-sex married couple households.

Editing the gender neutral parent identification questions

In addition to being able to easily report same-sex parents, we adjusted the way we edit the parent identification questions in two ways. The direct cohabitation question asking whether respondents have a boyfriend, girlfriend or partner in the household is only asked in specific situations—where there is an adult who lives in a household with another adult who is **not** related to them by birth, marriage, or adoption. So if a householder reports that her son lives with her and her grandchild, and then reports her son's unmarried partner as her 'other relative,' this couple—the son and his partner—will not be asked the direct cohabitation question. But the parent identification questions may indicate that the grandchild of the householder has the couple reported as her parents. The updated demographic edit now shows that this couple is cohabiting, since they have reported that they have a shared child.

The second change in the editing of the parent identification questions is that, in order to keep the variables parallel to the previous 'mother' and 'father' variables, parent 1 is always the mother if a mother is present. Parent 2 is always the father if a father is present. The only situation where this is not true is if the child has two same-sex parents present, in which case the second father would be listed as parent 1 or the second mother would be listed as parent 2. We did this since the number of children living with same-sex parents is too small to show as a separate group in the detailed America's Families

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[7] See the working paper located here: https://www.census.gov/library/working-papers/2015/demo/SEHSD-WP2014-36.html

and Living Arrangements table package we produce annually.[8] So the PEPAR1 variable identifying the first parent can be used as if it were the old PELNMOM variable that identified the record holder's mother, and the PEPAR2 variable can be used as if it were the old PELNDAD variable. Before this move to gender neutral parent identification questions, the America's Families and Living Arrangements tables showed children who lived with two mothers (or two fathers) as living with one parent. Now they are shown as living with two parents, but some characteristics (e.g., child support payments) of those parents shown in the aggregate will be noisy.

Table 1. Coupled Households by Type: 2018 Production vs. Bridge Estimates
(Numbers in thousands, except for percentages)

	Production Coupled Households (perrp + a_sex)		Bridge Coupled Households (revised perrp)		Change in Totals?	Change in Distribution %?
Total (in thousands)	69,350	100.0%	70,100	100.0%	↑	N/A
Opposite-sex Married	61,240	88.3%	61,400	87.6%	N.S.	↓
Opposite-sex Unmarried	7,169	10.3%	7,756	11.1%	↑	↑
Same-sex Married*	554	0.8%	471	0.7%	↓	↓
Same-sex Unmarried	384	0.6%	479	0.7%	↑	↑

Source: U.S. Census Bureau, Current Population Survey, Annual Social and Economic Supplement, 2018
Note: Arrows represent significant difference from production estimate at 90% Confidence Level.
N.S. = Not significant. N/A = Not applicable.
* Production estimate created using extract file that identifies who reported as same-sex spouse.

Estimates from the updated demographic edit

In this section, we show estimates that demonstrate the effect of the changes in data collection and processing. First, let's take a look at the estimates of coupled households. Note that in the 2018 production file,[9] in order to show the same-sex married couples, we needed to use the extract that is released separately that indicates which couples originally reported being same-sex married couples.[10] In the production file, they are edited and shown as unmarried partners.

Overall, the number of coupled households is higher in the bridge file—an estimated 70.1 million compared with 69.4 million in the production file. In Table 1, significant difference at the 90 percent level is indicated with either a green up arrow, meaning that the estimate is significantly higher in the bridge file, or a red down arrow, meaning that the estimate is significantly lower in the bridge file,

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[8] For example, see the tables with a 'C' in the title. This indicates the table shows estimates of children. The 2018 table package is located here: https://www.census.gov/data/tables/2018/demo/families/cps-2018.html
[9] In this paper, we use 'production file' to refer to the ASEC estimates that were published using the existing demographic edit. We refer to the ASEC 2017 estimates processed with the new demographic edit as the ASEC 2017 research file, and the ASEC 2018 estimates processed with the new demographic edit as the ASEC 2018 bridge file.
[10] For a list of downloadable extract files, please visit: https://www.census.gov/data/datasets/time-series/demo/income-poverty/miscellaneous.html

compared with the production file. Unmarried couples have a larger percent distribution of all coupled households on the bridge file than the production file, while married couples have a smaller percent distribution. Some of the changes mentioned above to the editing procedures for handling unmarried parents contribute to this increase in unmarried couples. We also expected the number and share of same-sex married couples to decrease, since one of the main reasons we revised the relationship to householder question was to decrease mismarks that result in erroneous reports of same-sex married couples. So, we believe the revised relationship categories and the changes to editing procedures are responsible for these differences across files. Further, the changes are in the direction we expected.

We caution against comparing ASEC bridge file estimates with ACS estimates, for a couple of reasons. First, the ACS estimates of households incorporate housing unit controls, while CPS estimates do not. Second, until 2019, ACS is still using the old relationship question and edit. So we expect that once the new question and edit are implemented in ACS in 2019 data, the estimate for same-sex married households may also decrease, as it did in CPS. But for now, we caution against comparisons.

In Table 2, we examine whether some key characteristics of coupled households have changed due to the new data collection and editing procedures. Coupled households are shown by type. We found no statistical differences between the production file and the bridge file. We examined whether both partners had a Bachelor's degree, both partners were employed, and whether the partners were in an interracial couple. Keep in mind that the same-sex groups are relatively small, so it does need to be a large difference in order to register as statistically significant.[11] These characteristics highlight the unique profile of coupled households, by type.

Table 2. Percent of Coupled Households by Type: 2018 Production vs. BridgeEstimates

Characteristic	Opposite-sex Married		Opposite-sex Unmarried		Same-sex Married		Same-sex Unmarried	
	Prod.	Brid.	Prod.	Brid.	Prod.	Brid.	Prod.	Brid.
Both Partner's, Bachelor's+	28.4	28.3	17.5	17.0	36.9	40.5	30.1	31.5
Both Partner's, Employed	47.9	48.0	60.2	60.1	62.1	61.3	62.5	59.3
% of Couples Interracial	5.2	5.2	10.2	10.1	9.5	10.6	14.5	15.0

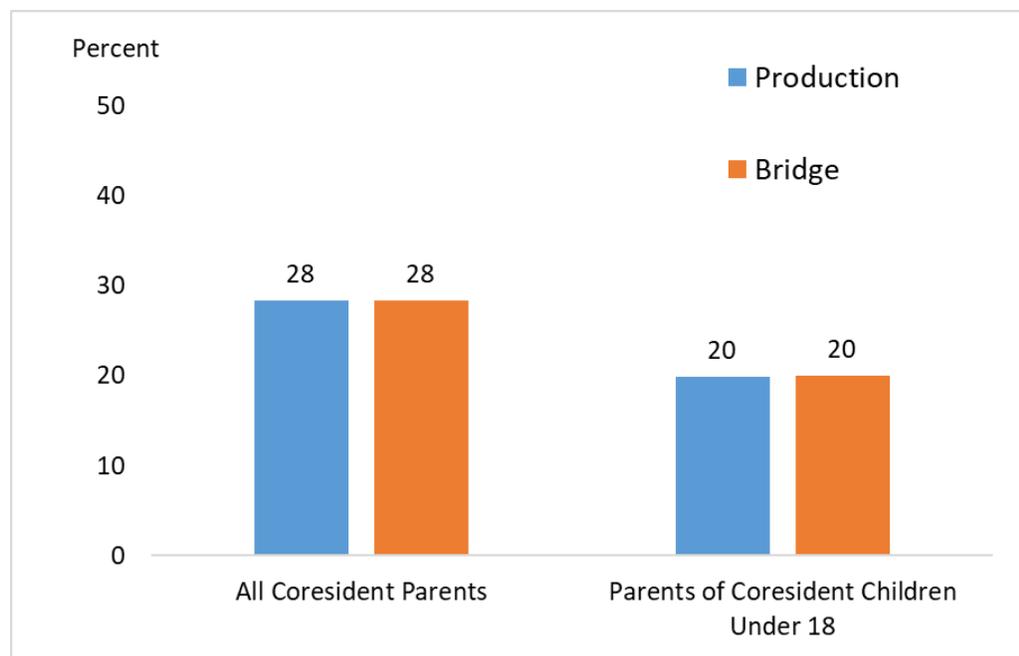*Source:* U.S. Census Bureau, Current Population Survey, Annual Social and Economic Supplement, 2018
Note: Prod. = production file; Brid. = bridge file
* Bridge file estimates do not differ significantly from the production estimates at the 90% confidence level.

Figure 4 examines whether estimates of adults who are parents differ between the bridge and production files. If we look at the percent of all those age 15 and over who have a coresident child, the difference is not significant. These estimates include parents living with adult children, so we also show comparisons of parents living with children under 18 across the production and bridge files. Again, we found no significant differences.

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[11] For margins of error for all tables, please see the appendices on pages 10 through 12.

Figure 4. Percent of Household Members Who Are Parents: 2018 Production vs. Bridge Estimates

Source: U.S. Census Bureau, Current Population Survey, Annual Social and Economic Supplement, 2018
Note: The bridge file estimates do not differ statistically from production estimates at the 90% confidence level.

However, when we look more closely at parents with coresident children of any age, by couple type, we see an increase in parents who are part of a same-sex married couple (see Table 3). This is exactly what we would expect, given that the change to the way respondents identify the presence of parents made it easier to report same-sex parents. We do not see a significant increase among same-sex unmarried parents in 2018, partially because of the small sample size, although we did find a significant increase in the 2017 research file.[12]

Table 3. Parents by Couple Type: 2018 Production vs. Bridge Estimates
(Numbers in thousands, except for percentages)

	Production Coresident Parents		Bridge Coresident Parents		Change in Totals?	Change in Distribution %?
Total (in thousands)	91,660	100.0%	91,860	100.0%	N.S.	N.A.
No Partner Present	19,940	21.8%	19,680	21.4%	N.S.	N.S.
Opposite-sex Married	66,520	72.6%	66,610	72.5%	N.S.	N.S.
Opposite-sex Unmarried	4,968	5.4%	5,228	5.7%	N.S.	N.S.
Same-sex Married*	166	0.2%	241	0.3%	↑	↑
Same-sex Unmarried	70	0.1%	107	0.1%	N.S.	N.S.

Source: U.S. Census Bureau, Current Population Survey, Annual Social and Economic Supplement, 2018
Note: Arrows represent significant difference from production estimate at 90% Confidence Level.
N.S. = Not significant. N/A = Not applicable.
* Production estimate created using extract file that identifies who reported as same-sex spouse.

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[12] For the 2017 estimates, please see Table 5 in conference presentation found here:
https://www.census.gov/library/working-papers/2019/demo/SEHSD-WP2019-13.html

Discussion and Conclusion

Changes made to relationship to householder and parent identification questions allow better measurement of the specific type of family/living arrangement, especially for same-sex couples and their children. The updated collection and processing in the CPS will affect data products such as the America's Families and Living Arrangements tables, and how families are shown in those products. Specifically, labeling of particular categories in tables published by the Census Bureau will change. In tables where the household or family type used to be listed as 'female householder, no husband present,' it will now be listed as 'female householder, no spouse present.' Similarly, 'male householder, no wife present' will now be listed as 'male householder, no spouse present.' And although there is no change to the Census Bureau's definition of family -- "a group of two persons or more residing together and related by birth, marriage, or adoption" -- the changes to the relationship categories mean changes to who is included in the family. For the first time, married couple families now include same-sex married couples. While the changes in measurement will result in some changes to data products, we will also preserve some of the historical time series tabulations which have always been limited to opposite-sex couples.

The other main improvement to measurement, the fact that parent identification questions are now gender neutral, results in changes in how children living with same-sex parents are tabulated. Since the new parent identification questions allow easy reporting of two mothers or two fathers, children living with two same-sex parents will be shown as living with two parents, rather than as living with one. This improved measurement will allow a more accurate representation of these children in data products than was possible previously.

This evaluation of the implementation of the revised relationship question in the CPS ASEC finds that the revised question and updated processing lead to a significant decrease in the number of same-sex married couple households. This is expected since one of the main reasons we revised the relationship to householder question was to decrease mismarks that result in erroneous reports of same-sex married couples. Estimates of same-sex unmarried couple households, on the other hand, have increased as a result of the updated processing system. Other researchers have pointed out that CPS yields lower estimates of unmarried couples than non-federal data sets,[13] and some of the changes mentioned to the editing procedures for handling unmarried parents may contribute to this increase in the estimate of unmarried couples. Finally, we find an increase in the number of same-sex married parents after implementing the gender neutral parent identification questions. Since the intent of the change was to make it straightforward for respondents to report the presence of same-sex parents in the household, this increase was expected. Despite changes to the relationship to householder question, and to the parent identification questions, we do not see many differences in the characteristics of coupled households in the bridge file, at least in terms of education, employment, and race. As we work to implement the revised relationship to householder question in the ACS in 2019, and in the decennial census in 2020, we will continue to evaluate the collection and processing of these estimates.

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[13]Please see: the 2018 working paper by Manning, et al here: https://www.bgsu.edu/content/dam/BGSU/college-of-arts-and-sciences/center-for-family-and-demographic-research/documents/working-papers/2018/WP-2018-05-Manning-Measuring-Cohabitation-in-National-Surveys.pdf

Appendix Table A

Margins of Error for Table 1, Coupled Households by Type: 2018 Production vs. Bridge Estimates

	Production Coupled Households *(perrp + a_sex)*		Bridge Coupled Households *(revised perrp)*	
Total (in thousands)	420	N/A	421	N/A
Opposite-sex Married	403	0.2	403	0.2
Opposite-sex Unmarried	156	0.2	162	0.2
Same-sex Married*	50	0.1	46	0.1
Same-sex Unmarried	42	0.1	46	0.1

Source: U.S. Census Bureau, Current Population Survey, Annual Social and Economic Supplement, 2018

* Production estimate created using extract file that identifies who reported as same-sex spouse.

N/A = Not applicable.

Note: Large integer values are margins of error in thousands; smaller values with decimals are in percentage points.

Appendix Table B
Margins of Error for Table 2, Percent of Coupled Households by Type: 2018 Production vs. Bridge Estimates

Characteristic	Opposite-sex Married		Opposite-sex Unmarried		Same-sex Married		Same-sex Unmarried	
	Prod.	Brid.	Prod.	Brid.	Prod.	Brid.	Prod.	Brid.
Both Partner's, Bachelor's+	0.3	0.3	0.8	0.8	4.4	4.8	5.0	4.5
Both Partner's, Employed	0.5	0.5	1.5	1.4	6.1	6.6	7.3	6.6
% of Couples Interracial	0.2	0.2	0.7	0.6	2.6	3.0	3.8	3.5

Source: U.S. Census Bureau, Current Population Survey, Annual Social and Economic Supplement, 2018

Prod. = Production File; Brid. = Bridge File

<u>Note</u>: Margins of error are in percentage points.

Appendix Table C
Margins of Error for Table 3, Parents by Couple Type: 2018 Production vs. Bridge Estimates

	Production Coresident Parents		Bridge Coresident Parents	
Total (in thousands)	759	N/A	760	N/A
No Partner Present	405	0.4	403	0.4
Opposite-sex Married	681	0.4	681	0.4
Opposite-sex Unmarried	207	0.2	212	0.2
Same-sex Married*	43	<0.1	52	0.1
Same-sex Unmarried	28	<0.1	35	<0.1

Source: U.S. Census Bureau, Current Population Survey, Annual Social and Economic Supplement, 2018

* Production estimate created using extract file that identifies who reported as same-sex spouse.

N/A = Not applicable

Note: Large integer values are margins of error in thousands; smaller values with decimals are in percentage points.