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SAME-GENDER SEX AMONG U.S. ADULTS:

TRENDS ACROSS THE TWENTIETH CENTURY AND DURING THE 1990s

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Abstract

Trends in reporting of same-gender sex are assessed using data from the 1988–2002 General Social Surveys ($Ns = 9,487$ males and 12,336 females). Analyses indicate that the reported prevalence of female-female sexual contact increased substantially and monotonically across twentieth-century birth cohorts, rising from 1.6 percent (Standard error [SE] = 0.60) for the cohort of U.S. women born prior to 1920 to 6.9 percent (SE = 0.81) for women born in 1970 and afterward. Increases in the reported prevalence of female-female contacts also occurred within the 1990s. These trends persist when statistical controls are introduced for changes in attitudes toward same-gender sexual behavior. No parallel trend is observed in the reporting of male-male sexual contacts during adulthood, although the proportion of U.S. men reporting such contacts in the past year and in the past five years increased during the 1990s.

Background

Changes over the twentieth century in the prevalence and patterns of same-gender sexual contact in the United States *might* be inferred from the increased visibility of gay men and lesbians and the growing social movement to secure their civil rights. In the absence of empirical evidence, however, such inferences are bedeviled by uncertainty.

Since the onset of the HIV epidemic, there has been a heightened interest in understanding the prevalence and patterns of same-gender sexual contact in the population at large. The first estimates of the prevalence of male-male contact, which were derived from surveys of large probability samples of the U.S. population, appeared in 1988–1991 (Fay et al. 1989; Michael et al. 1988; Rogers and Turner 1991; Turner, Miller, and Moses 1989). Comparable

estimates for female-female contact were presented in the early 1990s and began to appear in print in 1994–1995 (Laumann et al. 1994; Turner, Danella, and Rogers 1995).

Studies of variation in the reported prevalence of same-gender sex across birth cohorts have been hobbled by the relatively small survey samples available for any single birth cohort. The existing studies suggest that the proportion of U.S. adults who report some same-gender sexual contact during adulthood might have increased for females across the twentieth century, while the results for males are more ambiguous (Laumann et al. 1994, p. 303; Turner, Danella, and Rogers 1995, pp. 180–181). Results from the 1999–2000 National STD and Behavior Measurement Experiment (NSBME) (Villarroel et al. 2002; Villarroel et al., in press) and recent work with males by Anderson and Stall (2001) suggest that a shorter-term increase may also have occurred during the 1990s,¹ but methodological limitations restrict confidence in these conclusions.²

To provide a firmer basis for assessing trends in the reporting of same-gender sexual contact, we use data from more than 21,000 interviews conducted by the General Social Survey (GSS) between 1988 and 2002 (Davis, Smith, and Marsden 2003). Our analysis seeks to answer four questions:

- Is there significant variability by birth cohort over the twentieth century in the reported prevalence of same-gender sexual contact?
- Did the reported prevalence of same-gender sexual contact change during the 1990s?
- Do trends in the reported prevalence of female-female sexual contact diverge from those for male-male contact, as suggested by the 1999–2000 NSBME?
- Do changes in the reporting of same-gender sexual contact persist when changes in societal tolerance of same-gender sex are statistically controlled?

Data and Methods

SAMPLE DESIGN AND EXECUTION

Data were collected in 10 rounds of the GSS conducted between 1988 and 2002 ($N = 9,487$ males and 12,336 females). The GSS surveyed probability samples of English-speaking U.S. adults ages 18 and older who resided in households. During the period 1988 to 2002, the GSS obtained a median survey response rate of 76.7 percent (range: 70.0 percent to 82.4 percent; American Association for Public Opinion Research [AAPOR 2000] response rate 5).

MEASUREMENTS OF SAME-GENDER SEXUAL CONTACT

All 10 GSS surveys conducted between 1988 and 2002 included questions that allow us to identify respondents who reported having a same-gender sexual partner in the past 12 months and, from the 1989 survey onward, a same-gender sexual partner since age 18.³ From 1991 onward, the GSS also included questions that permit us to identify respondents

¹The 1999–2000 NSBME estimated a considerably higher prevalence of same-gender sexual contact, particularly among females, than Laumann et al. (1994) had reported using surveys conducted earlier in the decade. Using data from the General Social Survey program, Anderson and Stall (2001) report an increase in the prevalence of male-male sex during the 1990s.

²There are important procedural variations between the NSBME and the surveys used by Laumann et al. (1994) to generate earlier estimates. These variations included differences in question context, survey mode (telephone versus in-person), survey response rates, and the population sampled. Anderson and Stall's (2001) analysis lacked formal statistical imputation of the large amount of missing data on sexual contacts in the General Social Survey (although they do provide alternative estimates derived from three different treatments of the missing data), and they did not incorporate statistical controls for the potential impact of shifts in societal tolerance of same-gender sex on the reporting of this behavior.

who reported having a same-gender sex partner in the past five years. Question wordings were:

Since age 18: “Now thinking about the time since your 18th birthday (including the past 12 months), how many female [male] partners have you had sex with?” (Respondent supplied a number.)

For past five years: “Now think about the past five years—the time since [month/year], and including the past 12 months, how many sex partners have you had in that five-year period? No partners, 1 partner, 2 partners, 3 partners, 4 partners, 5–10 partners, 11–20 partners, 21–100 partners, more than 100 partners?” Have your sex partners in the last five years been exclusively male, both male and female, exclusively female?”

For past year: “How many sex partners have you had in the last 12 months? No partners, 1 partner, 2 partners, 3 partners, 4 partners, 5–10 partners, 11–20 partners, 21–100 partners, more than 100 partners?” Have your sex partners in the last 12 months been exclusively male, both male and female, exclusively female?”

OTHER MEASUREMENTS

Our analyses use a range of sociodemographic variables to define subpopulations for which prevalences will be estimated and to impute missing data. We also use answers to two questions on attitudes toward same-gender sex to assist in imputation and to understand trends in reported prevalence over twentieth-century birth cohorts.⁴

STATISTICAL ANALYSES

Our initial statistical analyses evaluated the quality of the relevant GSS measurements by assessing the consistency of respondents’ reporting of same-gender sexual contacts and interviewers’ coding of respondents’ gender. These initial analyses were conducted on unweighted observations using SPSS version 6 (1993) and Stata version 6 (Stata Corporation 2000). We then assessed trends in same-gender sexual behavior reported during the 1990s and across twentieth-century birth cohorts using population-weighted data. Case weights were used to adjust for the unequal probabilities of selection for persons residing in households with different numbers of eligible adults. Estimation procedures and hypothesis testing used Stata statistical algorithms that take account of weighting and the GSS’s complex sample design in estimating sampling variation.⁵

Additional technical details concerning sample design, survey execution, and question wording can be found in Turner et al. (2004).

³Our analysis combines data from two, randomly assigned, experimental conditions in the 1988 GSS that tested alternate introductions to the sex questions. (One introduction merely promised confidentiality, while the second introduction also linked the questions to the AIDS epidemic.) Smith (1992) has reported that “there were no statistically significant effects of the introduction on reports of sexual behavior” (p. 316). In 1991 a randomly assigned subset of GSS respondents was asked to report the number of sex partners they had in the past 12 months and the past five years without providing the response categories (0, 1, 2, 3, 4, 5–10, 11–20, 21–100, more than 100 partners) used by the standard question format. Open-ended responses for this subset of 1991 respondents were recoded into the categories used in the standard format question.

⁴Questions were: (1) “What about sexual relations between two adults of the same sex—do you think it is always wrong, almost always wrong, wrong only sometimes, or not wrong at all?” and (2) “And what about a man who admits that he is a homosexual... Should such a person be allowed to teach in a college or university, or not?”

⁵The GSS sample was analyzed as a stratified clustered sample using survey year to define strata and the GSS sampling error code variable (SAMPCODE) to define population sampling units (PSUs).

Results

CONSISTENCY OF SEXUAL BEHAVIOR AND GENDER MEASUREMENTS

Measures of the consistency of respondents' reports of same-gender sex are calculated from the three questions on same-gender sexual experience. While these questions obviously do not measure the same characteristic, they offer opportunities for logically inconsistent reporting (for example, reporting no same-gender partners in the past five years but both male and female partners during the past year). Our analyses (Turner et al. 2004) found that, across all respondents, more than 99 percent of 41,542 pairwise comparisons of these measurements were logically consistent.

Black et al. (2000) have noted that errors in recording respondents' gender could have a substantial impact on estimates of the prevalence of same-gender sex. The GSS includes two indicators of respondent gender. The first is the interviewers' observation of the respondents' gender. (Interviewers were instructed to ask about gender if they were uncertain.) In addition, interviewers constructed a household roster that included the age, name, relationship to head of household, marital status (if age 13 or older), and gender of every household member. Interviewers subsequently recorded the line number in the household roster for the survey respondent. Comparison of these two measurements led us to estimate that while interviewer observations were known to be the more accurate measurement, there were likely to be approximately 81 instances of gender miscoding in the interviewer observation data for the 21,823 GSS respondents (Turner et al. 2004).

As a check on the potential impact of these two types of inconsistency, alternative estimates of the prevalence of same-gender sexual contacts were derived after purging the sample of cases for which there was either logically inconsistent reporting of same-gender sexual contacts or disagreement between the interviewer's recording of the respondent's gender and the gender derived using the household enumeration form. Purging these cases did not alter the substantive conclusions we reach below regarding variation in the prevalence of same-gender sex reported across birth cohorts or during the 1990s. (For additional details, see Turner et al. 2004).

IMPACT OF MISSING MEASUREMENTS

Of the 21,823 GSS respondents, 3,252 (14.9 percent) did not answer the questions that are required to determine if they had a same-gender sex partner during the 12 months prior to the survey. Similarly high rates of missing data afflicted measurements of same-gender contacts in the past five years (15.9 percent) and since age 18 (21.4 percent).⁶ To examine the potential for bias introduced by this nonresponse, we used the available data to estimate the odds that missing cases would have reported same-gender contacts if they had completed the survey. Imputations were performed using both logistic regression modeling and a multiple imputation algorithm developed by Raghunathan, Solenberger, and Van Hoewyk (2002). The prevalence estimates that were obtained using these procedures were highly similar to those obtained using the reported data alone. No deviation was greater than 0.25 percentage points (Turner et al. 2004). Given the similarity of prevalence estimates derived with and without imputation, we confined subsequent analyses to respondents' reports of same-gender sex without imputation of missing responses.

⁶Reported rates of missing data and subsequent imputations exclude persons surveyed in years when measurement was not made (1988 for contact since age 18, and 1988–90 for contact in past five years).

TRENDS BETWEEN 1988 AND 2002

Table 1 presents annual prevalence estimates derived from the GSS surveys for the reporting of same-gender sexual contacts since age 18, in the past five years, and in the past year. While relatively small sample sizes—and possibly non-equivalent nonsampling errors across years—introduce “noise” in these time series, the point estimates show a pattern of increased reporting that appears to be stronger for females. For females, there has been an increase in reporting of all categories of same-gender contact, and these increases are all statistically significant regardless of whether we: (1) treat each individual year as a category in a 2 by N category table, (2) dichotomize the time period into two six-year intervals, 1988–1994 versus 1996–2002, or (3) use logistic regression with year as a continuous predictor. The magnitude of these increases is quite large. The reporting of female-female contact in the past year, for example, more than doubles between 1988–1994 and 1996–2002, and the odds of reporting contact in the past five years and contact since age 18 increase by factors of 1.5 to 1.7 (odds ratios [OR] for 1996–2002 versus pre-1996).

For males, the reporting of same-gender contacts exhibits less consistent differences over time. Male reporting of same-gender contacts since age 18 did not evidence statistically significant variation by year in any of the three analyses. Reporting of male-male contacts in the last five years yielded a significant difference only when the time period was dichotomized. Male reporting of contacts in the past year, however, showed statistically significant variation in all three analyses—a result described by Anderson and Stall (2001).

The estimates displayed in table 1 also suggest that these survey measurements may be subject to noteworthy nonsampling errors. The estimated percentage of U.S. females reporting same-gender sex since age 18, for example, declines from 5.8 percent (SE = 1.1 percent) in 1989 to 2.6 percent (SE = 0.7 percent) in 1990 and 2.4 percent (SE = 0.6 percent) in 1991. If sampling error alone were responsible for this large fluctuation, it would be an extremely rare event ($p = 0.001$). Similarly, reporting of female-female contacts in the past year in the 1989 survey (1.2 percent, SE = 0.5 percent) was curiously higher than reporting in adjacent years (0.1 to 0.4 percent in 1988.1 to 0.4 percent in 1990.1 to 0.4 percent in 1991). This is also an improbable result if sampling error alone were responsible ($p = 0.005$, comparing 1989 to aggregate of the other three years).

VARIATION IN TRENDS BY AGE GROUP

Previously, we reported that analysis of data from the General Social Survey for 1989 to 1991 and the 1989 National Household Seroprevalence Survey (a probability sample of adults in Dallas County, Texas) indicated a substantially higher prevalence of reported female-female sexual contacts among the youngest females (Turner, Danella, and Rogers 1995). When the data from table 1 are stratified by age at interview (see table 2), we find that the change in reported prevalences during the 1990s occurred most dramatically for females ages 18 to 29. The estimated odds of reporting female-female sexual contact in the past year increased by 3.0 times ($p < 0.01$) for 18- to 29-year-old females surveyed in 1988–1994 versus 1996–2002. Similar increases were found for the reporting of contact in the past five years (OR = 2.4, $p < 0.01$) and contact since age 18 (OR = 1.7, $p < 0.05$). In each instance, the increase in reporting of same-gender contacts by 18- to 29-year-old females exceeds that for males in the same age group (ORs = 1.1 to 1.7). We also note the surprising finding that estimates of the prevalence of same-gender sexual contact during past year among women ages 46 and older increased by a factor of 3.1 ($p < 0.01$) from 0.5 percent (SE = 0.2) during 1988–1994 to 1.4 percent (SE = 0.3) in 1996–2002.

TRENDS ACROSS THE TWENTIETH CENTURY

Since adult sexual activity and new partner acquisition are profoundly influenced by advancing age, measurements of same-gender partnerships during the last year and last five years are less informative than reports of partnerships since age 18 when assessing trends in same-gender sexual behavior over the past century. Figure 1 and the first panel of table 3 show the estimated proportions of U.S. men and women who reported one or more same-gender sexual partnerships since age 18 by birth cohort. These results evidence a substantial and highly significant ($p < 0.0001$) monotonic increase in reporting of female-female sexual contact from 1.6 percent (SE = 0.6 percent) for women born prior to 1920 to 6.9 percent (SE = 0.8 percent) for women born between 1970 and 1984. Since more recent birth cohorts had a shorter period of opportunity for same-gender contacts, these results are likely to understate the true magnitude of the change that has occurred.

Men, in contrast, show a surprisingly stable pattern of reported same-gender partnerships. From cohorts born before 1920 to those born in the 1970s and early 1980s, the estimated percentage of men with a reported same-gender partnership ranges between 3.5 percent (SE = 0.7 percent) and 5.5 percent (SE = 0.9 percent), with no discernable linear trend nor cohort-to-cohort variations ($p = 0.268$ for linear trend; and ($p = 0.666$, using design-adjusted Pearson chi-square test of independence for 2×7 table of prevalence by cohort).

VARIATION ACROSS SUBPOPULATIONS

Table 3 presents estimates of the prevalence of reported same-gender sexual contact since age 18 for subpopulations defined by selected demographic and social characteristics. In addition, prevalences are estimated for persons with different histories of heterosexual contact and different attitudes toward same-gender sex. These estimates reveal some large subpopulation differences in the reported prevalence of adult same-gender sexual contact. We note, in particular:

- A markedly lower prevalence of reported same-gender contact for currently married adults (2.9 percent, SE = 0.3 percent for both men and women) and markedly higher prevalences for never-married men (9.4 percent, SE = 0.7 percent) and women (9.0 percent, SE = 0.8 percent).
- No statistically detectable differences in the estimated prevalence for white, black, and other racial groups ($p > 0.2$).
- A much higher prevalence of same-gender sexual contact among men—but not women—who reside in the 12 largest metropolitan areas of the middle Atlantic and Pacific states (men: 14.8 percent, SE = 2.0 percent versus 4.6 percent, SE = 0.3 percent, $p < 0.0001$; women: 6.4 percent, SE = 1.5 percent versus 4.6 percent, SE = 0.3, $p = 0.14$).
- A modest elevation in the estimated prevalence of same-gender sex among women with postgraduate degrees (7.7 percent, SE = 1.2 percent versus 4.1 to 5.5 percent; SE = 0.4 percent to 1.2 percent for women with lesser levels of education).
- Higher estimated prevalence for women—and to a lesser extent men—who report no religion (women: 11.0 percent, SE = 1.2 percent and men: 6.7 percent, SE = 0.8 percent). Men and women who report religions other than Catholicism, Protestantism, or Judaism also have somewhat higher estimated prevalences (women: 9.0 percent, SE = 1.6 percent; and men: 7.7 percent, SE = 1.5 percent).
- A strong association between same-gender sexual behavior and attitudes toward same-gender sex and the civil rights of homosexuals. (It is interesting to note, however, that among persons who report that same-gender sex is “always wrong,”

2.2 percent [SE = 0.3 percent] of women and 2.8 percent [SE = 0.4 percent] of men also report a same-gender partner in adulthood.)

- For both males and females, persons who reported no heterosexual partners in adulthood were considerably more likely to report a same-gender sexual partner (28.2 percent, SE = 2.5 percent of men and 16.9 percent, SE = 1.8 percent of women). While an increase in the number of heterosexual partners is associated with a slight decline in the estimated prevalence of same-gender sex for men, this is not true for women. Women who report 10 or more heterosexual partners have a substantially elevated likelihood of reporting female-female sexual contacts in adulthood (9.6 percent, SE = 1.2 percent and 16.3 percent, SE = 2.4 percent for women reporting 10–19 and 20+ heterosexual partners, respectively).

Attitude Change and Behavior Change

ACROSS THE TWENTIETH CENTURY

Figure 2 shows the proportion of U.S. men and women by birth cohort who responded “not wrong at all” when they were asked whether same-gender sex was “always wrong, almost always wrong, wrong only sometimes, or not wrong at all.”⁷ These data make evident the dramatic variation across twentieth-century birth cohorts in tolerance of same-gender sex. Among women, the percentage saying same-gender sex is “not wrong at all” rises from 5.6 percent (SE = 1.0 percent) for women born before 1920 to 45.2 percent (SE = 2.1 percent) for women born after 1970. Men show a similar pattern of increase from 7.5 percent (SE = 1.5 percent) for men born before 1920 to 32.0 percent (SE = 0.7 percent) for men born in 1970 or later. The level of tolerance expressed by men in the post-1970 birth cohort is, however, significantly lower than that expressed by women (32 percent versus 45 percent, $p < 0.0001$).

The parallel increases in the tolerance for and reporting of same-gender sex raise concerns that observed changes in reported behaviors might reflect shifts in reporting bias in response to increasing tolerance rather than actual change in the prevalence of same-gender sexual contact. To explore this possibility, we used logistic regression to predict the odds of reporting a same-gender contact since age 18 as a function of birth cohort and binary indicator variables coded to represent the categories of response to the question on tolerance of same-gender sex. As expected, the regression indicated that there was a strong net association between tolerance and the odds that respondents would report a same-gender sexual experience. Compared to respondents who said same-gender sex was “always wrong,” men and women who said it was “not wrong at all” were much more likely to report a same-gender sexual partner since age 18, controlling for birth cohort (for women, OR = 4.0, SE = 0.66, $p < 0.001$; for men, OR = 3.7, SE = 0.67, $p < 0.001$; data not shown). Controlling for tolerance, birth cohort remained a statistically noteworthy predictor of *increased* odds of reporting female-female sexual contacts since age 18 (OR = 1.013 per year, SE = 0.005, $p = 0.01$). In contrast, birth cohort is a statistically unreliable predictor of *decreased* odds of reporting male-male contacts in adulthood when tolerance is controlled (OR = 0.993 per year, SE = 0.005, $p = 0.14$). This is to say that a statistically reliable increase in reporting of female-female sex across twentieth-century birth cohorts persists when tolerance is controlled, while reporting of male-male sex shows a statistically insignificant decline.

⁷Our analysis differs from that reported by Loftus (2001) in that we focus on the attitudes in 1988 to 2002 of survivors of birth cohorts born in different decades of the twentieth century. Loftus’s analysis focused on the attitudes expressed by the entire adult population alive in survey years between 1973 and 1998.

BETWEEN 1988 AND 2002

Analysis of reported tolerance of same-gender sex between 1988 and 2002 yielded the surprising finding of a dramatic increase in tolerance during the 1990s. Comparing the periods 1988–1994 and 1996–2002 (data not shown), we found judgments that same-gender sex was “not wrong at all” increased from 15.6 percent (SE = 0.93 percent) to 26.0 percent (SE = 1.1 percent) among U.S. men ($p < 0.0001$) and from 19.4 percent (SE = 0.94) to 31.3 percent (SE = 1.1 percent) among U.S. women ($p < 0.0001$). We again used logistic regression to estimate the joint impact of survey year (1994 and earlier⁸ versus 1996–2002) and tolerance on the odds of reporting same-gender sexual contacts. When tolerance was controlled, females in 1996–2002 still had statistically significant increases in reporting of same-gender sexual contact in adulthood (OR = 1.4, $p = 0.03$) and in the past year (OR = 1.8, $p = 0.013$) but not in the past five years (OR = 1.3, $p = 0.165$). When tolerance is controlled, the increase in 1996–2002 in the reporting of male-male sexual contact during the past year (OR = 1.7, $p = 0.011$) remains statistically reliable, but the reporting of contact in the past five years does not (OR = 1.4, $p = 0.116$). There also remains no discernable difference between 1989–1994 and 1996–2002 in reporting of male-male contact since age 18 when tolerance is controlled (OR = 1.0, $p > 0.5$).

Discussion

Our results indicate that there were very substantial increases in the proportion of U.S. women who reported same-gender contacts during the 1990s. Compared to women surveyed in prior years, women surveyed between 1996 and 2002 had 2.4 times higher odds of reporting same-gender sexual contact in the prior 12 months, 1.7 times higher odds of reporting contact in the prior five years, and 1.5 times higher odds of reporting contact since age 18. These increases are all statistically reliable ($p \leq 0.001$), and they are remarkable to observe in the short period of 14 years (1988–2002). These increases are most pronounced among women who were 18 to 29 years old at the time they were surveyed. The estimated prevalence of female-female sexual contact in the prior year for this age group almost tripled from 1.5 percent to 4.2 percent. Males also evidence an increase in reporting over the past 14 years, although the increases are somewhat smaller (ORs = 1.8 for contact in the past year, 1.4 for past five years, and 1.2 since age 18), and the increase in reporting of male-male contact since 18 is statistically unreliable ($p = 0.19$).

Research by Johnson et al. (2001, p. 1839) suggests that a parallel trend in the reporting of same-gender sexual contact occurred in Great Britain between 1990 and 2000. In 1990 the percentage of British males (ages 16 to 44) who reported same-gender sexual contact during the preceding five years increased from 1.5 percent to 2.6 percent (OR = 1.8), while for British females this percentage increased from 0.8 percent to 2.6 percent (OR = 3.3).⁹ Analyses of the British results that control for shifts in societal tolerance have not yet been published, but the currently available results suggest that the trends observed during the 1990s in the United States are not unique.

The increases in the reporting of female-female sexual contact during the 1990s mirror a larger trend found across the twentieth century in the United States. Analysis of the reports of same-gender sexual contact by birth cohort documents a substantial monotonic increase in the proportion of U.S. females who report same-gender sexual contact during adulthood. Prior work by the present investigators and others using the limited data available in the

⁸This time period varies depending on the measurement: 1988–1994 for contact since age 18; 1989–1994 for contact since age 18; and 1991–1994 for contact in the past five years.

⁹The 95 percent confidence intervals (CI) for British estimates are: males, 1.5 percent (95 percent CI: 1.2–1.9) to 2.6 percent (95 percent CI: 2.2–3.1); females, 0.8 percent (95 percent CI: 0.6–1.1) to 2.6 percent (95 percent CI: 2.2–3.1).

early 1990s suggested this phenomenon. The ample sample sizes obtained by combining the 1988 through 2002 GSS surveys now substantiate these earlier findings. The prevalence of reported same-gender contacts in adulthood rises more than threefold for women, from 1.6 percent for survivors of birth cohorts born before 1920 to 6.9 percent for women born after 1970. This phenomenon is not mirrored among men. The prevalence of reported adult male-male contact shows no statistically significant linear trend or decade-to-decade fluctuation.

These findings coexist with similarly dramatic increases in the tolerance of same-gender sex expressed by U.S. men and women. Across birth cohorts, the proportion of U.S. men and women who reported that same-gender sex was “not wrong at all” increased by factors of 4 and 8, respectively.¹⁰ Substantial changes can also be detected within the 1990s.

When we first attempted in 1989 to estimate the prevalence of same-gender sexual contact among U.S. men, we noted the likely confounding of changes in the prevalence of same-gender sex in a population and changes in reporting bias, that is, the willingness of respondents to report these behaviors in surveys. Changes over time in societal tolerance can be expected to affect both the prevalence of same-gender sexual behaviors and survey respondents’ willingness to report these behaviors. Since we cannot control levels of societal tolerance in ways that would permit randomized experiments, disentangling the impact of “true change” and change in reporting bias cannot be done with certainty.

As an alternative, our analyses demonstrate that statistical controls for the level of reported tolerance do not erase the trend of increased reporting of adult female-female sexual contact across the twentieth century. Nor does this control permit us to detect an equivalent trend in the reporting of male-male contacts across the century. These results provide some—albeit incomplete—comfort to those of us who worry that what is being observed might be a change in reporting bias alone. Against the backdrop of increasing tolerance for same-gender sex over the twentieth century, the divergence in the reporting of male-male and female-female contact in adulthood may also be interpreted as reassuring. If changes in response bias due to growing societal tolerance were responsible for the increased reporting of female-female sex over the twentieth century, one might have expected a similar trend among males.

LIMITATIONS

Our findings should be read with a clear appreciation of the limitations of these data and analyses. First, as we have previously noted, the GSS time series of same-gender sexual contact measurements exhibits anomalies that suggest the nonsampling errors in these measurements are not of trivial magnitude. They may in some cases be larger than the sampling errors we employ to guide our inferences. While caution is appropriate given these anomalies, the extent of nonresponse to the questions on same-gender sex and the imperfect reliability of our measurements, the magnitude of the changes that have occurred in reporting of female-female sexual contact encourages us to believe that they are unlikely to be due solely to such factors.

We also note that our analysis of changes across the twentieth century relies on the reporting of persons from different birth cohorts interviewed during the last 12 years of that century and the second year of the twenty-first century. This cohort analysis is informative about the behaviors reported by the segment of the U.S. population that survived into that time period, but we do not know the extent to which our findings can be generalized to nonsurvivors.

¹⁰Odds ratios for comparison of response of cohort born prior to 1920 to those born in 1970 and later.

Finally, while the evidence of an increased prevalence of reported female-female sexual behavior is strong, the cause(s) of this increase can only be speculated about at present. It is interesting to note, however, that the major increase in the reported prevalence of adult female-female sexual contact begins with cohorts of women born in the 1940s and 1950s. Prevalence doubled from 2.7 percent for the 1940s cohort to 5.4 percent for the 1950s cohort.

The 1940s and 1950s birth cohorts differ in many ways. Among them we note that women born during the 1950s entered adolescence following the development of reliable oral contraception, the 1960s “sexual revolution,” and the emergence of women’s and gay liberation movements in the United States. These factors may have changed both the feasibility and acceptability—and ultimately the prevalence—of same-gender and other sexual behaviors.

We have previously seen that the increased prevalence of female-female sex tracks a parallel increase in societal tolerance of same-gender sex. Whether (and how) these various phenomena are linked is unclear. Given the likely impact of changing tolerance on the willingness of respondents to both engage in and to report same-gender sexual contacts, disentangling such influences will not be easy and may not be possible. We note, however, that greater variation over time in the prevalence of same-gender contacts among females would be consistent with theoretical arguments advanced by some psychologists that female sexuality is “more malleable than male in response to socio-cultural and situational factors” (Baumeister 2000, p. 34).

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Figure 1.

Estimated percentage of U.S. adults reporting same-gender sexual contact since age 18, by gender and birth cohort. Tabulated from the 1989–2002 General Social Surveys using case weights to adjust for unequal probabilities of within-household selection. Bars represent ± 1 standard error.

Figure 2.

Estimated percentage of U.S. adults responding "not wrong at all" when asked their opinion about "sexual relations between two adults of the same sex," by gender and birth cohort. Tabulated from the 1989–2002 General Social Surveys using case weights to adjust for unequal probabilities of within-household selection. Bars represent ± 1 standard error.

Table 1

Estimated Prevalence of Same-Gender Sexual Contacts (and Standard Error), by Survey Year and Gender, for U.S. Adults Ages 18 and Older

Year	Since 18			Last 5 Years			Last Year		
	Female	Male		Female	Male		Female	Male	
	% SE (Unwtd. N)	% SE (Unwtd. N)		% SE (Unwtd. N)	% SE (Unwtd. N)		% SE (Unwtd. N)	% SE (Unwtd. N)	
1988	—	—	—	—	—	—	0.14% (569)	2.21% (569)	
1989	5.79% (688)	5.48% (559)	—	—	—	—	1.21% (784)	1.43% (583)	
1990	2.59% (560)	4.94% (474)	—	—	—	—	0.43% (634)	1.77% (493)	
1991 ^a	0.68% (560)	1.03% (474)	—	—	—	—	0.22% (634)	0.57% (493)	
1993	2.36% (678)	4.12% (482)	1.04% (738)	0.37% (738)	3.58% (513)	0.84% (513)	0.30% (728)	2.25% (509)	
1994	0.63% (802)	0.88% (598)	0.37% (828)	0.50% (828)	2.22% (607)	2.00% (607)	1.72% (820)	1.79% (595)	
1996	3.84% (1,355)	2.63% (1,051)	0.50% (1,509)	0.57% (1,509)	0.53% (1,146)	3.33% (1,146)	0.43% (1,526)	0.62% (1,151)	
1998	0.71% (802)	0.72% (598)	0.50% (828)	0.47% (1,410)	0.53% (1,146)	0.53% (1,146)	0.42% (1,526)	0.44% (1,151)	
	3.42% (1,296)	5.18% (1,024)	2.68% (1,410)	3.06% (1,410)	4.76% (1,128)	4.76% (1,128)	2.38% (1,410)	3.62% (1,119)	
	0.59% (1,257)	0.73% (964)	0.50% (1,320)	0.47% (1,320)	0.53% (1,009)	0.53% (1,009)	0.42% (1,341)	0.44% (1,019)	
	4.68% (1,257)	4.66% (964)	3.06% (1,320)	3.06% (1,320)	4.76% (1,009)	4.76% (1,009)	2.38% (1,341)	3.62% (1,019)	
	0.64% (1,257)	0.67% (964)	0.47% (1,320)	0.47% (1,320)	0.53% (1,009)	0.53% (1,009)	0.42% (1,341)	0.44% (1,019)	
	5.53% (1,257)	4.59% (964)	2.92% (1,320)	2.92% (1,320)	3.78% (1,009)	3.78% (1,009)	2.46% (1,341)	3.80% (1,019)	
	0.81% (1,257)	0.77% (964)	0.56% (1,320)	0.56% (1,320)	0.68% (1,009)	0.68% (1,009)	0.53% (1,341)	0.63% (1,019)	

Year	Since 18			Last 5 Years			Last Year		
	Female	Male		Female	Male		Female	Male	
	(Unwtd. N)	(Unwtd. N)		(Unwtd. N)	(Unwtd. N)		(Unwtd. N)	(Unwtd. N)	
2000	6.61%	6.35%		4.73%	4.62%		3.44%	3.61%	
	0.79%	0.88%		0.74%	0.77%		0.74%	0.67%	
	(1,131)	(894)		(1,268)	(1,001)		(1,288)	(1,003)	
2002	5.38%	5.71%		3.85%	3.60%		2.49%	3.16%	
	0.74%	0.87%		0.63%	0.68%		0.44%	0.64%	
	(1,211)	(965)		(1,206)	(983)		(1,231)	(1,000)	
Categorical, <i>p</i>	0.0007	0.1677		0.0013	0.1940		<0.0001	0.0431	
Linear, <i>p</i>	0.0018	0.1486		<0.0001	0.1875		<0.0001	0.0006	
Pre-1995 versus Post-1995									
1988–1994	3.63%	4.55%		2.16%	3.03%		1.13%	1.96%	
	0.34%	0.39%		0.29%	0.37%		0.16%	0.23%	
	(4,083)	(3,164)		(3,075)	(2,266)		(5,260)	(3,900)	
1996–2002	5.52%	5.29%		3.62%	4.22%		2.69%	3.55%	
	0.37%	0.40%		0.31%	0.39%		0.28%	0.33%	
	(4,895)	(3,847)		(5,204)	(4,121)		(5,270)	(4,141)	
OR	1.55	1.17		1.70	1.41		2.42	1.84	
Categorical, <i>p</i>	0.0002	0.1868		0.0013	0.0297		<0.0001	0.0001	

Note.—Estimates tabulated from 1988–2002 General Social Surveys using weights to adjust for varying probabilities of selection for adults residing in households with different numbers of eligible adults. Statistical tests were performed with software (Stata Corporation 2000) that takes account of effects of weighting and complex sample design on variance of estimates. Values shown as “Categorical, *p*” are *p*-values for design-adjusted Pearson chi-square statistic for test of independence in the 2-by-*N* table of year by same-gender sex. “Linear, *p*” values are *p*-values for design-adjusted *t*-tests of the coefficient for year in a logistic regression predicting likelihood of reporting same-gender sex as a function of the numeric value of year.

^aIn 1991 respondents were randomly assigned to report the total number of their partners in the past five years and in the past 12 months as either a number (new format) or using the response categories 0, 1, 2, 3, 4, 5–10, 11–20, 21–100, 100+ (standard format). Comparison of responses to the alternative questions revealed no significant differences in the likelihood of reporting a same-gender partner in the past five years for both men and women and in the past year for men (*p* > 0.5). Women in 1991 were, however, less likely to report a female partner in the past year when questioned using the standard format of the question (0.15 percent versus 0.48 percent, *p* = 0.01). This effect was not found for women’s reporting of same-gender sex in the past five years (*p* > 0.5) nor among men for either period (*p* > 0.5).

Estimates of Percentage of U.S. Adults Reporting Same-Gender Sexual Contacts Pre-1995 and 1996–2000 by Recency of Contact, Gender, and Age at Time of Interview

Table 2

Behavior and Years Compared	Pre-1994			1996–2002			Odds ratio
	%	SE	Unwtd. N	%	SE	Unwtd. N	T2:T1 Prevalence
Same-Gender Sex since age 18							
1989–1994 versus 1996–2002							
Males, ages 18–29	4.5%	0.9%	682	4.9%	0.9%	841	1.09
Females, ages 18–29	4.8%	0.9%	815	8.0%	1.0%	1,016	1.73*
Males, ages 30–45	5.0%	0.6%	1,239	5.8%	0.6%	1,446	1.18
Females, ages 30–45	44%	0.6%	1,545	6.6%	0.6%	1,812	1.52*
Males, ages 46+	4.2%	0.6%	1,242	5.1%	0.6%	1,554	1.22
Females, ages 46+	2.2%	0.4%	1,715	3.1%	0.4%	2,053	1.41
Same-Gender Sex in Last Five Years							
1991–1994 versus 1996–2002							
Males, ages 18–29	2.8%	0.8%	453	4.4%	0.8%	885	1.62
Females, ages 18–29	2.9%	0.8%	566	6.5%	0.9%	1,031	2.36**
Males, ages 30–45	4.0%	0.7%	905	5.4%	0.6%	1,547	1.36
Females, ages 30–45	2.7%	0.5%	1,161	4.0%	0.5%	1,928	1.47
Males, ages 46+	2.2%	0.5%	907	3.0%	0.5%	1,683	1.40
Females, ages 46+	1.3%	0.3%	1,340	1.8%	0.3%	2,232	1.37
Same-Gender Sex in Last Year							
1989–1994 versus 1996–2002							
Males, ages 18–29	2.2%	0.5%	849	3.8%	0.8%	880	1.74
Females, ages 18–29	1.5%	0.4%	1,035	4.2%	0.8%	1,043	3.00**
Males, ages 30–45	2.5%	0.4%	1,537	4.8%	0.6%	1,546	1.96**
Females, ages 30–45	1.7%	0.3%	1,880	3.2%	0.5%	1,936	1.90*
Males, ages 46+	1.2%	0.3%	1,513	2.3%	0.4%	1,709	1.87*
Females, ages 46+	0.5%	0.2%	2,333	1.4%	0.3%	2,278	3.05**

Note.—Estimates tabulated from 1988–2002 General Social Surveys using weights to adjust for varying probabilities of selection for adults residing in households with different numbers of eligible adults. Statistical tests were performed with software (Stata Corporation 2000) that takes account of effects of weighting and complex sample design on variance of estimates.

* $p < .05$.

** $p < .01$.

Table 3

Estimated Prevalence among U.S. Adults of Reported Same-Gender Sexual Contact since Age 18, by Gender and Selected Demographic and Attitudinal Characteristics

Subpopulation	Females			Males		
	%	SE	Unwtd. N	%	SE	Unwtd. N
Birth Cohort						
Pre-1920	1.6%	0.60%	579	4.3%	1.14%	323
1920s	2.1%	0.55%	809	3.5%	0.70%	535
1930s	2.5%	0.59%	863	5.5%	0.93%	683
1940s	2.7%	0.45%	1,370	4.6%	0.64%	1,166
1950s	5.4%	0.51%	2,073	5.1%	0.56%	1,644
1960s	6.1%	0.57%	2,034	5.4%	0.57%	1,632
1970s and later ^a	6.9%	0.81%	1,228	5.0%	0.74%	1,021
	$p<0.0001$		linear, $p<0.0001$	$p = 0.6666$		linear, $p = 0.2678$
Marital Status						
Married	2.9%	0.27%	4,229	2.9%	0.29%	3,793
Widowed	1.7%	0.43%	1,134	8.1%	1.98%	261
Divorced	6.8%	0.74%	1,448	5.2%	0.79%	908
Separated	9.0%	1.71%	359	3.6%	1.35%	191
Never Married	9.0%	0.76%	1,806	9.4%	0.73%	1,856
	$p<0.0001$			$p<0.0001$		
Race ^b						
White	4.5%	0.28%	7,367	4.8%	0.30%	6,021
Black	5.0%	0.71%	1,205	6.4%	0.99%	680
Other	6.3%	0.14%	406	4.8%	1.20%	308
	$p = 0.2805$			$p = 0.2162$		
Urbanicity						
12 Largest MSAs	5.8%	1.03%	724	11.6%	1.39%	475
MSAs ranked 13–100	6.7%	0.72%	1,378	6.6%	0.78%	1,064
Suburbs of 12 largest MSAs	5.1%	0.78%	998	5.3%	0.94%	791
Suburbs of MSAs ranked 13–100	5.0%	0.64%	1,283	5.1%	0.73%	1,074

Subpopulation	Females			Males		
	%	SE	Unwtd. N	%	SE	Unwtd. N
Other Urban	3.8%	0.38%	3,602	3.6%	0.38%	2,905
Other Rural	3.4%	0.66%	993	3.7%	0.76%	702
	$p = 0.0020$			$p < 0.0001$		
Region ^c						
New England states	4.1%	0.94%	466	3.3%	0.99%	364
Middle Atlantic states	5.4%	0.79%	1,291	6.5%	0.70%	984
North Central states	3.2%	0.40%	2,249	4.9%	0.55%	1,824
South Atlantic states	4.4%	0.62%	1,588	4.3%	0.61%	1,264
South Central states	4.8%	0.65%	1,508	4.5%	0.74%	1,114
Mountain states	5.4%	1.17%	611	4.4%	1.10%	437
Pacific states	6.4%	0.71%	1,265	5.7%	0.73%	1,024
	$p = 0.0113$			$p = 0.1790$		
Urban × Region ^d						
Largest MSAs located in Pacific and Middle Atlantic States	6.4%	1.46%	430	14.8%	2.00%	281
Other Locales	4.6%	0.26%	8,548	4.6%	0.28%	6,730
	$p = 0.1405$			$p < 0.0001$		
Education ^e						
Less than high school	5.5%	0.73%	1,353	3.6%	0.67%	1,012
High school graduate	4.1%	0.32%	4,937	5.1%	0.38%	3,664
Junior college graduate	4.8%	0.83%	642	5.4%	1.12%	465
College graduate	4.5%	0.55%	1,458	5.1%	0.67%	1,211
Postgraduate degree	7.7%	1.12%	566	5.7%	0.89%	641
	$p = 0.0031$			$p = 0.3480$		
Religion						
Protestant ^f	3.7%	0.28%	5,485	4.6%	0.37%	3,794
Catholic ^g	4.1%	0.46%	2,139	4.3%	0.51%	1,700
Jewish ^h	4.1%	1.60%	173	3.0%	1.22%	146
None	11.0%	1.23%	794	6.7%	0.80%	1,030
Other	9.0%	1.59%	362	7.7%	1.51%	319

Subpopulation	Females			Males		
	%	SE	Unwtd. N	%	SE	Unwtd. N
<i>p</i> < 0.0001						
Frequency of Attending Religious Service ^g				<i>p</i> = 0.0041		
Never	8.5%	0.86%	1,308	6.5%	0.65%	1,420
Once a year or less ^h	5.9%	0.59%	1,729	3.9%	0.51%	1,746
Several times a year	5.1%	0.69%	1,101	4.6%	0.70%	948
Once month	4.9%	0.94%	640	5.3%	1.14%	505
2–4 times a month ⁱ	3.2%	0.52%	1,420	4.0%	0.75%	841
Every week	2.9%	0.44%	1,867	5.7%	0.75%	1,061
More than once a week	2.3%	0.53%	761	3.4%	0.90%	384
<i>p</i> < 0.0001						
			linear, <i>p</i> < 0.0001	<i>p</i> = 0.0225	linear, <i>p</i> = 0.5384	
Year of Survey						
1989–1994	3.6%	0.34%	4,083	4.6%	0.39%	3,164
1996–2002	5.5%	0.37%	4,895	5.3%	0.40%	3,847
<i>p</i> = 0.0002						
Number of Heterosexual Partners since Age 18 ^j				<i>p</i> = 0.1868		
0	16.9%	1.77%	506	28.2%	2.52%	382
1	1.6%	0.23%	2,908	3.5%	0.56%	1,128
2	3.1%	0.52%	1,189	4.4%	0.94%	513
3	3.4%	0.72%	946	4.7%	0.96%	522
4	5.5%	1.04%	628	2.6%	0.96%	434
5–9	4.1%	0.64%	1,338	2.7%	0.45%	1,237
10–19	9.6%	1.16%	704	2.8%	0.52%	1,041
20+	16.3%	2.36%	322	4.0%	0.62%	1,296
<i>p</i> < 0.0001						
			linear, <i>p</i> < 0.0001	<i>p</i> < 0.0001	linear, <i>p</i> < 0.0001	
Attitude toward Homosexual Sex						
Always wrong	2.2%	0.28%	3,131	2.8%	0.35%	2,745
Almost always wrong	1.3%	0.67%	225	5.8%	1.57%	226
Sometimes wrong	6.2%	1.29%	350	5.9%	1.26%	286
Not wrong at all	9.1%	0.79%	1,407	9.3%	0.92%	993
<i>P</i> < 0.0001						

Subpopulation	Females			Males		
	%	SE	Unwtd. N	%	SE	Unwtd. N
Permit Homosexual to Teach						
Allow	5.0%	0.38%	4,055	5.0%	0.39%	3,249
Not allow	2.0%	0.39%	1,239	3.2%	0.66%	1,090
	$P < 0.0001$			$P = 0.0501$		

Note.—P-values are design-adjusted Pearson chi-square test of independence in the $2 \times R$ table of reported same-gender sex since 18 (yes, no) by the R categories of the sociodemographic variable. “Linear, p” values are shown for metric variables and derive from logistic regression in which reporting of same-gender sex was predicted from a model treating the predictor as a metric variable. Numeric values assigned to categories are shown in the table’s footnotes. All analyses employ algorithms that take account of weighting and complex sample design of the GSS.

^aThe term “1970s and later” includes 244 persons who were 18+ at time of the survey and were born between 1980 and 1984 (216 of these respondents answered the question on same-gender sex since age 18). In logistic regression birth decades were assigned a number corresponding to the first year of the time period, e.g., 1920, 1930, etc. Persons born prior to 1920 were assigned the numeric value 1910.

^bFor 2002, respondents were permitted to specify multiple races. To provide comparability to the coding used in 1989–2000, we used the first mentioned race category and assigned responses to the three categories: white, black or African-American, and other. 74 respondents who specified Hispanic in 2002 were coded as white.

^cGeographical regions are: New England (CT, MA, ME, NH, RI, and VT); Middle Atlantic (NY, NJ, and PA); North Central (IA, IL, IN, KS, MI, MN, MO, ND, NE, OH, SD, and WI); South Atlantic (DC, DE, FL, GA, MD, NC, SC, VA, and WV); South Central (AL, AR, KY, LA, MS, OK, TN, and TX); Mountain (AZ, CO, ID, MT, NM, NV, UT, and WY); and Pacific (AK, CA, HI, OR, and WA).

^dVariable identifies MS As among the 12 largest in the United States that are found in the middle Atlantic and Pacific states. This would include the MS As of New York, NY, Philadelphia, PA, and Los Angeles, CA, in 1980s to 2000s; Nassau-Suffolk, NY, in 1980s and 1990; and Riverside–San Bernardino, CA, in 1990s and 2000s.

^eIn logistic regression, categories were assigned values for years of school completed: 11, 12, 14, 16, and 18, respectively.

^fIn imputation analyses, religion was recoded to three categories: (1) Protestant, Catholic, or Jewish, (2) other, and (3) none.

^gIn logistic regression, categories were assigned numeric values for approximate number of times per year: 0, 0.5, 6, 12, 36, 52, 75.

^hCategory combines responses of less than once a year and once a year.

ⁱCategory combines responses of 2–3 times a month and nearly every week.

^jIn logistic regression, categories were assigned numeric values for approximate number of partners: 0, 1, 2, 3, 4, 7, 15, 25.