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# An Examination of Demographic and Substantive Differences between Early and Late Respondents in a Face-to-face Field Survey

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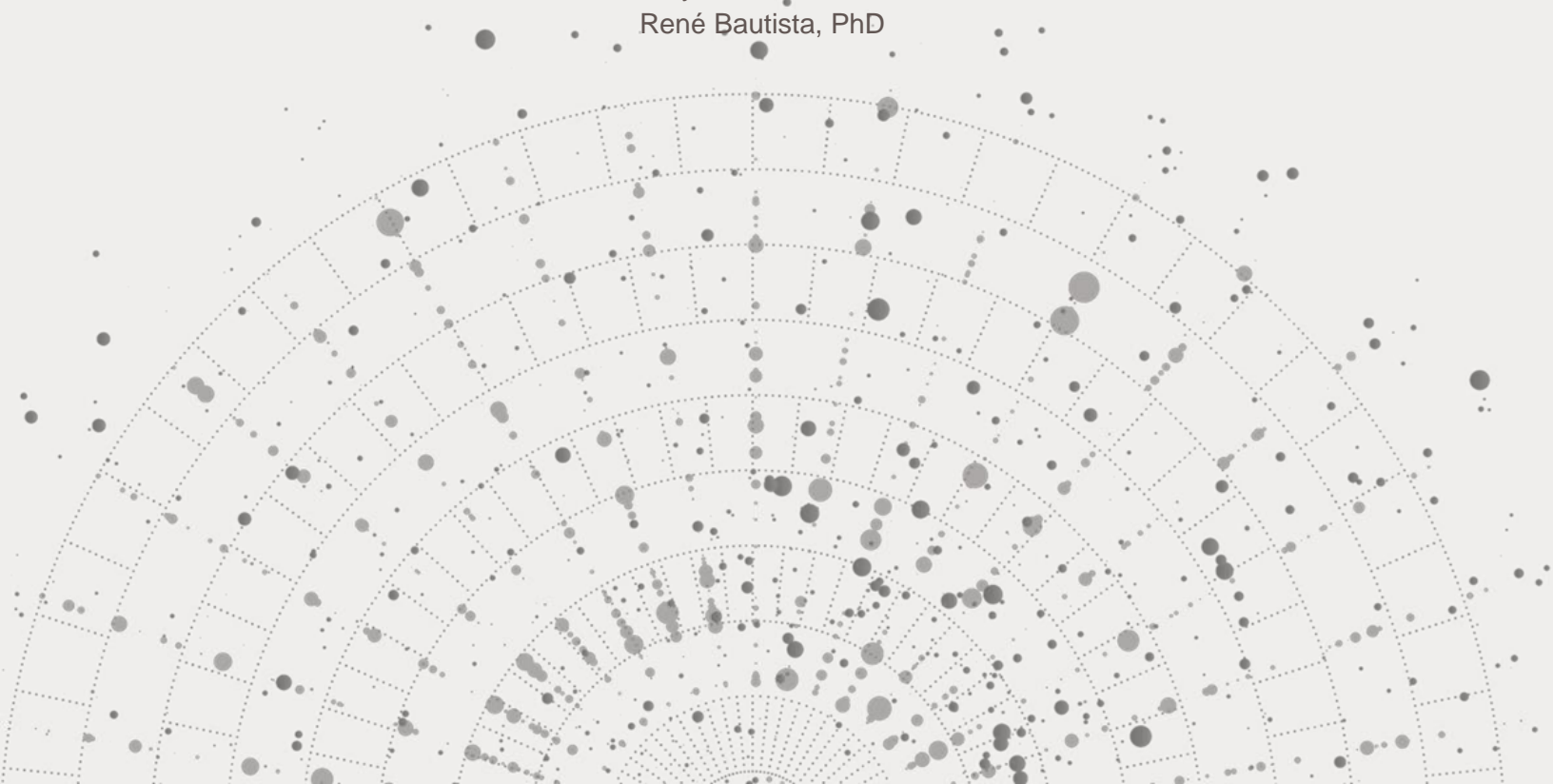
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# Abstract

The General Social Survey (GSS), a biennial nationally representative survey of the U.S. adult population, has employed subsampling since 2004. Approximately halfway through the field period in years prior to 2020, half of the remaining cases are randomly subsampled for a more focused follow-up, while the other cases are dropped. Subsampling in the GSS has helped to improve response rates and to achieve cost and sample size efficiencies (O’Muircheartaigh and Eckman 2007). This paper explores the extent to which subsampled (or late) respondents vary from non-subsampled (or early) respondents in GSS 2014, 2016, and 2018. We first examine the demographic characteristics of early and late respondents. Second, we explore substantive differences between the two groups on key analytic variables (e.g., attitudes toward premarital sex, abortion, the death penalty, gun regulation, marijuana legalization, national spending priorities). Finally, we examine differences between early and late respondents on key GSS analytic variables controlling for demographic differences using multivariate logistic regression. Our investigations over three years of the GSS suggest that some demographic and substantive differences between early and late respondents exist, consistent with previous GSS research (Smith 2006). Our results also suggest that most of the differences on key analytic variables do not persist after controlling for demographic characteristics in multivariate logistic regression models. This finding is consistent with past research on interviewer-administered surveys that find that late respondents are not different from early responders on most variables net of demographic characteristics (e.g., Keeter et al. 2006). Differences found between the 2014, 2016, and 2018 analyses emphasize the need for continued research related to subsampling in the GSS.

# Introduction

Subsampling is a method for addressing challenges related to unit nonresponse where a subsample is taken from the initial sample for more focused or tailored follow-up. First introduced by Hansen and Hurwitz (1946), this approach, also known as a two-phase design, is an attractive approach for many surveys offering a way to control, and potentially reduce, costs during the latter parts of data collection (Elliot, Little, and Lewitzky 2000; Groves et al. 2003). It allows researchers to focus their collection efforts while still improving the overall response rate. Such a subsample might be assigned high-performing interviewers, be given a shortened questionnaire, be offered a larger monetary incentive, or be presented a different data collection mode to obtain their cooperation.

Examining the differences in subsampled respondents provides us an understanding around potential nonresponse bias that may be corrected for under a two-phase design. This is often conceptualized in single-phase designs by comparing early and late respondents. Late respondents in interviewer-administered studies are often different on demographic characteristics, but not always on substantive variables (Curtin, Presser, and Singer 2000; Keeter et al. 2000, 2006; Voigt, Koepsell, and Daling 2003; Studer et al. 2013; Sigman et al. 2014; Kirchner and Olson 2017; Bach, Eckman, and Daikeler 2020).

The earliest studies to examine early and late respondents, such as Curtin, Presser, and Singer (2000) found significant differences in age, sex, race, and education for those who required extra efforts to obtain a response while Keeter and colleagues (2000) similarly found significant differences for race, education, and income. In addition, Keeter et al. (2006) found that less than ten percent of the substantive variables they examined were significantly different between the early and late respondents. More recently, Kirchner and Olson (2017) found that the hardest to reach respondents were significantly different on age, race, employment status, and households with children. Bach et al. (2020) built on these observable differences in demographic measures by examining nonresponse-measurement error models in two interviewer-administered surveys. Their findings suggest that low response propensity respondents may not introduce any more error than high response propensity respondents, meaning that any differences we do observe for substantive responses may be legitimate differences, as opposed to measurement error. Overall, the lack of differences in substantive variables between early and late respondents may be because surveys often control for differences in demographics either through weighting or including demographics in analytic models.

While looking at single-phase designs can be informative, surveys with two-phase designs have not received the same level of attention. Most of these studies have focused on telephone (e.g., Curtin, Presser, and Singer 2000) or self-administered surveys (e.g., Sigman et al. 2014). When face-to-face surveys are examined, they are typically of specialized populations (e.g., Studer et al. 2013 looks at males eligible for military service). We wish to further expand this research by looking at a two-phase design that primarily focuses on face-to-face data collection: the General Social Survey.

The General Social Survey (GSS) is a nationally representative survey conducted face-to-face and is generally collected biennially. Less than 10 percent of cases are conducted over the phone when face-to-face recruitment fails to obtain an interview. The GSS introduced subsampling in 2004, randomly subsampling half of the remaining cases for a more focused follow-up about halfway through the field period (Smith 2006). The other half of the cases are dropped from further follow-up but are “represented” in the final sample by the subsampled cases accounted for in the higher weight (proportional to the subsampling weighting fraction) to the initial set of sampled cases. This subsampling approach has helped to improve the GSS response rate and to achieve cost and sample size efficiencies (O’Muircheartaigh and Eckman 2007). The GSS team has often used larger monetary incentives and telephone interviews to entice respondents to participate during the second phase.

Following the conclusion of the 2004 survey, GSS researchers compared the originally sampled completes to completes obtained after subsampling (Smith 2006). This analysis found no significant differences in sex, race, Hispanic ethnicity, marital status, or number of children between those who completed before and after subsampling, but did find differences where subsampled cases were more likely to live in the Northeast, to be employed full-time and less than 65, to have a college degree, and to be Democrats.

To our knowledge, no reexamination of the GSS subsampling has been completed since it was introduced over 15 years ago. We have seen from earlier work that late respondents help GSS achieve a higher overall response rate. However, if late GSS respondents are not significantly different from

early respondents on substantive measures, then the value of any extra effort could be reconsidered. The cost to recruit subsampled cases is much higher, because they need more contacts, enjoy a longer field period, are assigned to experienced interviewers, and are offered larger monetary incentives.

This paper seeks to explore how subsampled cases (or late respondents) differ from non-subsampled cases (or early respondents) in more recent years of the GSS and to see whether subsampled respondents provide unique data for key estimates. For clarity, we refer to these two groups hereafter as early respondents and subsampled respondents. Our key research questions are:

1. Do subsampled respondents have a different demographic profile from early respondents?
2. Do subsampled respondents provide different responses on key substantive variables?
  - a. Do any differences in substantive variables persist after controlling for demographic differences?
3. Are the demographic and substantive differences consistent from one year of GSS to the next?

## Methods

We focused our analyses on the 2014, 2016, and 2018 GSS cross-sectional surveys. The final sample sizes for each year were 2,538, 2,867, and 2,348, respectively. The AAPOR RR5 response rates for these years were 69.2 percent, 61.3 percent, and 59.5 percent, respectively. A summary of the subsampling design for each GSS year is in Table 1. In all three years, data collection began in the early spring, but the field period before subsampling increased from ten and a half weeks in 2014 to twelve weeks in both 2016 and 2018. This lengthening field period may partially explain the shrinking percent of completes obtained after subsampling in subsequent years (32 percent unweighted in 2014 down to 10 percent in 2018). The 2016 GSS also had a slightly longer field period after subsampling, though this does not seem to have substantially increased the percentage of completes.

**Table 1:** Subsampling Design for the General Social Survey 2014-2018

GSS Year	NOT SUBSAMPLED Unweighted % (Weighted %)	SUBSAMPLED Unweighted % (Weighted %)	Data collection start	Subsampling start	Data collection end	Weeks in field before subsampling	Weeks in field after subsampling
2014	68.2 (57.6)	31.8 (42.4)	3/31/2014	6/12/2014	10/11/2014	10.5	17
2016	80.0 (72.5)	20.0 (27.5)	4/5/2016	6/30/2016	11/20/2016	12	21
2018	89.4 (80.0)	10.6 (20.0)	4/12/2018	7/5/2018	11/10/2018	12	18

Weighted estimates using WTSSNR for 2014 and BALLOTFORMTWTNR for 2016 and 2018 and used Taylor Series Estimation.

We first compared the demographic characteristics of subsampled respondents to early respondents, including sex, age, race, ethnicity, education, household characteristics, and geography. We only

examined valid response options excluding all missing values. We used Rao-Scott chi-square test statistics to properly adjust for the complex sample design (Heeringa, West, and Berglund 2010) and weighted to adjust for sampling error and nonresponse.<sup>1</sup> This allowed us to see whether there are overall significant differences in demographics between early and subsampled responders. In addition, we explored substantive differences between the two groups on 32 key analytic variables in the GSS (e.g., political ideology and party, attitudes toward abortion, the death penalty, gun regulation, marijuana legalization, national spending priorities) using the same design-adjusted Rao-Scott tests. We selected a variety of the most popular variables from the GSS Data Explorer, in order to cover a multitude of GSS topic areas, as well as factual and attitudinal questions. A full list of the variables examined is included in Appendix Table A1.

Second, we examined differences between early and subsampled respondents for key GSS substantive variables using multivariate logistic regression models accounting for complex survey design. In these multivariate logistic regression models, the dichotomized substantive response serves as our dependent variable while the subsampling indicator serves as our primary independent variable. We also included demographic variables typically used in post-stratification (sex, age, race, ethnicity, education, region) as independent variables as well as the interview mode (face-to-face versus telephone). Details on how response categories were grouped are included in Appendix Table A1. To estimate variances properly, we used complex sample design adjusted models including weights adjusting for sampling error and nonresponse. To help with interpretation of the regression models, we calculated average marginal effects (AMEs) and their associated standard errors. All analyses were completed in SAS 9.4 using the SURVEYFREQ and SURVEYLOGISTIC procedures using Release 1 of the GSS 1972-2022 Cumulative File.

## Results

### Bivariate Results

We first analyze results of the 2014 GSS survey and compare results with the 2016 and 2018 GSS surveys. In the 2014 sample, we saw multiple significant differences across the weighted demographics characteristics including sex, age, education, income, employment, and survey mode (see Table 2A). The largest difference was for survey mode where subsampled respondents were less likely to complete the survey in person compared to over the phone at 77 percent compared to 91 percent. The significant difference in survey mode makes sense given telephone interviews are often offered as an option to subsampled respondents to complete the survey. For other demographic characteristics,

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<sup>1</sup> Our intent was to use WTSSNR for all three years, a weight that includes a nonresponse adjustment for first-stage sampling units. However, we used BALLOTFORMWTNR, an updated version of WTSSNR correcting for an error related to the random assignment of respondents to ballot and form, for GSS 2016 and 2018. For details on the ballot and form error, please see [GSS Methodological Report #134](#).



subsampled respondents were significantly more likely to be female, be only a high school graduate, and be employed full-time. They were significantly less likely to be age 65 and older, less than high school educated, and have incomes less than \$25,000 a year. Most of these significant differences averaged a five-percentage point difference between the two groups, with the largest difference for household income at an eight-percentage point difference. Overall, this paints a picture that many subsampled respondents were female, at least high school graduates, employed working age adults, earning enough to not be under the poverty threshold, and more likely to respond on the phone when offered the option.

**Table 2A:** Comparison of Early and Subsampled Cases by Weighted Demographic Characteristics in the General Social Survey 2014

	Early Cases Percent (SE)	Subsampled Cases Percent (SE)	Difference
<b>Male</b>	47.46 (1.34)	43.12 (1.86)	*
<b>Age</b>			
18-25	11.29 (1.04)	11.45 (1.43)	
26-34	16.30 (1.09)	17.68 (1.73)	
35-44	16.85 (1.14)	18.85 (1.27)	
45-54	18.30 (1.00)	17.83 (1.42)	
55-64	18.54 (1.09)	18.85 (1.22)	
65+	18.73 (1.17)	15.35 (1.39)	*
<b>Black</b>	13.82 (1.28)	14.69 (1.73)	
<b>Hispanic</b>	18.48 (1.61)	16.23 (1.72)	
<b>Education</b>			
Less than high school	14.80 (1.21)	9.91 (1.18)	**
High school graduate	48.39 (1.36)	54.42 (2.28)	*
Some college but not bachelor's	6.77 (0.60)	7.97 (1.06)	
Bachelor's degree	18.95 (1.35)	18.32 (1.49)	
Graduate degree	11.10 (0.86)	9.38 (1.15)	
<b>Adult in house</b>			
1 adult	18.33 (0.96)	16.42 (1.30)	
2 adults	54.55 (1.33)	55.79 (2.25)	
3 or more adults	26.74 (1.40)	27.23 (2.28)	
<b>Children in household</b>	72.62 (1.46)	70.42 (2.12)	
<b>Currently married</b>	52.83 (1.70)	52.62 (2.18)	
<b>Ever divorced or legally separated</b>	29.19 (1.27)	29.94 (1.75)	
<b>Household income &lt;\$25,000</b>	26.08 (1.43)	18.42 (1.47)	****

	Early Cases Percent (SE)	Subsampled Cases Percent (SE)	Difference
<b>Full-time employment</b>	47.32 (1.40)	53.19 (1.86)	**
<b>Region</b>			
Northeast	18.53 (2.01)	15.30 (2.15)	
Midwest	20.69 (2.12)	22.33 (1.90)	
South	36.95 (3.25)	37.00 (3.84)	
West	23.83 (2.35)	25.37 (2.97)	
<b>In-person survey mode (vs. telephone)</b>	90.94 (1.10)	76.73 (1.79)	****

\* p < 0.05, \*\* p < 0.01, \*\*\* p < 0.001, \*\*\*\* p < 0.0001. Sample size = 2,538. All estimates weighted using WTSSNR and used Taylor Series Estimation. "Difference" corresponds to a significant difference in the Rao-Scott chi-square test statistic.

When examining the 2014 cases on their substantive responses, we see that subsampled respondents were significantly more likely to be opposed to sex education in schools (five-percentage point difference), to favor capital punishment for murder (six percentage point difference), and to be ideologically conservative (seven-percentage point difference) compared to moderate (see Table 2B). In addition, subsampled respondents are less likely to think there was too little national spending on assistance for childcare (seven-percentage point difference) and too little spending on mass transportation (five-percentage point difference). Non-significant differences averaged around a two-percentage point difference.

**Table 2B:** Comparison of Early and Subsampled Cases by Selected Weighted Substantive Characteristics in the General Social Survey 2014

	Early Cases Percent (SE)	Subsampled Cases Percent (SE)	Difference
<b>At least pretty happy</b>	86.75 (0.88)	88.98 (1.29)	
<b>Satisfied with financial situation</b>	73.25 (1.38)	73.91 (1.98)	
<b>Satisfied with job</b>	86.45 (1.16)	86.41 (1.56)	
<b>Working mom does not hurt child</b>	77.45 (1.43)	75.01 (1.99)	
<b>Pre-marital sex is at least sometimes wrong</b>	42.20 (1.61)	42.24 (2.46)	
<b>Same-sex sex is at least sometimes wrong</b>	48.90 (1.78)	53.18 (2.48)	
<b>Abortion is OK for any reason</b>	45.45 (1.78)	45.41 (2.26)	
<b>Favor sex education in school</b>	92.34 (1.03)	87.44 (1.35)	**
<b>Favor affirmative action</b>	18.54 (1.50)	19.37 (2.20)	
<b>Opposite race in neighborhood - Yes</b>	75.11 (1.56)	74.53 (1.98)	
<b>Allow a racist to speak</b>	61.08 (1.72)	58.37 (1.87)	
<b>Favor law for gun permits</b>	72.99 (1.59)	72.22 (2.36)	
<b>Favor capital punishment for murder</b>	62.32 (1.42)	68.04 (1.55)	**

	Early Cases Percent (SE)	Subsampled Cases Percent (SE)	Difference
<b>Favor legalization of marijuana</b>	53.67 (1.75)	57.27 (2.24)	
<b>Political party</b>			
Democrat	31.99 (1.31)	29.98 (1.67)	
Independent	45.27 (1.26)	44.12 (1.89)	
Republican	20.21 (1.18)	23.80 (1.58)	
Other political party	2.52 (0.45)	2.10 (0.65)	
<b>Political views</b>			
Liberal	26.04 (1.28)	25.44 (1.47)	
Moderate	42.66 (1.43)	36.38 (2.19)	*
Conservative	31.30 (1.52)	38.19 (2.05)	*
<b>Government should improve standard of living</b>			
Government should help poor	31.26 (1.70)	26.63 (2.18)	
Government and self should help poor	41.43 (1.53)	44.60 (2.11)	
Poor are responsible to help themselves	27.31 (1.64)	28.77 (2.17)	
<b>Confidence in the Executive Branch</b>	57.47 (1.53)	53.22 (2.37)	
<b>Bible is at least the inspired word of God</b>	75.68 (1.25)	79.11 (1.64)	
<b>Did not attend church in the last year</b>	25.28 (1.06)	26.80 (1.86)	
<b>People can be trusted</b>	31.12 (1.84)	29.05 (2.34)	
<b>Too little national spending on...</b>			
Assistance for childcare	52.64 (1.50)	46.11 (2.02)	**
Halting the rising crime rate	60.13 (2.02)	63.27 (2.60)	
Dealing with drug addiction	61.76 (1.70)	55.78 (2.64)	
Improving nation's education system	71.84 (1.91)	70.36 (2.31)	
Developing alternative energy sources	57.69 (1.57)	56.18 (1.88)	
Improving and protecting the environment	59.57 (1.88)	56.17 (3.05)	
Welfare	20.36 (1.69)	19.12 (2.24)	
Improving and protecting nation's health	58.70 (1.80)	56.82 (2.90)	
Mass transportation	40.84 (1.64)	35.71 (2.00)	*
Improving conditions of Blacks	36.30 (2.02)	30.34 (2.45)	
Supporting scientific research	41.86 (1.46)	41.51 (1.96)	

\* p < 0.05, \*\* p < 0.01, \*\*\* p < 0.001, \*\*\*\* p < 0.0001. Sample size = 2,538. All estimates weighted using WTSSNR and used Taylor Series Estimation. "Difference" corresponds to a significant difference in the Rao-Scott chi-square test statistic.

When compared to 2014, the 2016 GSS looks different when comparing the early and subsampled respondents. We only observed two significant demographic differences for 2016 between the number of adults in household and the survey mode (see Table 3A). The increase in telephone completes over in-person completes is expected like in 2014, though the increase in 2016 is just over half the size observed in 2014 (eight-percentage point difference compared to fourteen). This reduction may be due in part to the increased field period (a week and a half) before subsampling. Three or more adult households were less likely to be in the subsampled portion of the sample (22 percent compared to 29 percent). We also only see one difference in substantive variables (see Table 3B). Subsampled respondents were less likely to believe pre-marital sex was at least sometimes wrong (35 percent compared to 42 percent). None of the variables observed as significant in 2014 were significant in 2016.

**Table 3A:** Comparison of Early and Subsampled Cases by Weighted Demographic Characteristics in the General Social Survey 2016

	Early Cases Percent (SE)	Subsampled Cases Percent (SE)	Difference
<b>Male</b>	45.94 (1.37)	42.79 (2.48)	
<b>Age</b>			
18-25	12.79 (0.97)	11.23 (1.81)	
26-34	16.50 (0.98)	13.50 (1.70)	
35-44	16.39 (0.95)	19.50 (2.15)	
45-54	18.56 (1.07)	16.96 (1.59)	
55-64	17.64 (0.97)	19.00 (2.15)	
65+	18.12 (0.89)	19.82 (2.10)	
<b>Black</b>	17.97 (1.46)	15.07 (2.03)	
<b>Hispanic</b>	15.19 (1.65)	16.15 (2.34)	
<b>Education</b>			
Less than high school	12.70 (1.15)	10.07 (1.50)	
High school graduate	51.79 (1.42)	53.37 (2.59)	
Some college but not bachelor's	6.66 (0.63)	8.98 (1.24)	
Bachelor's degree	18.45 (1.29)	16.73 (1.68)	
Graduate degree	10.40 (0.84)	10.85 (1.54)	
<b>Adult in house</b>			
1 adult	18.08 (0.84)	20.89 (1.68)	
2 adults	53.32 (1.39)	56.74 (2.26)	
3 or more adults	28.60 (1.54)	22.37 (2.70)	*
<b>Children in household</b>	71.25 (1.36)	72.37 (2.20)	
<b>Currently married</b>	49.11 (1.52)	51.20 (2.72)	
<b>Ever divorced or legally separated</b>	31.69 (1.27)	28.64 (2.15)	

	Early Cases Percent (SE)	Subsampled Cases Percent (SE)	Difference
<b>Household income &lt;\$25,000</b>	24.98 (1.17)	22.15 (2.45)	
<b>Full-time employment</b>	46.06 (1.31)	50.49 (2.39)	
<b>Region</b>			
Northeast	18.40 (1.90)	17.46 (2.59)	
Midwest	21.75 (1.80)	18.99 (2.65)	
South	37.72 (3.34)	39.06 (4.32)	
West	22.12 (2.52)	24.49 (3.26)	
<b>In-person survey mode (vs. telephone)</b>	94.59 (0.65)	86.60 (1.75)	****

\* p < 0.05, \*\* p < 0.01, \*\*\* p < 0.001, \*\*\*\* p < 0.0001. Sample size = 2,867. All estimates weighted using BALLOTFORMWTNR and used Taylor Series Estimation. "Difference" corresponds to a significant difference in the Rao-Scott chi-square test statistic.

**Table 3B:** Comparison of Early and Subsampled Cases by Selected Weighted Substantive Characteristics in the General Social Survey 2016

	Early Cases Percent (SE)	Subsampled Cases Percent (SE)	Difference
<b>At least pretty happy</b>	84.01 (0.92)	87.35 (1.52)	
<b>Satisfied with financial situation</b>	72.03 (1.37)	72.41 (2.28)	
<b>Satisfied with job</b>	86.97 (1.06)	84.43 (2.24)	
<b>Working mom does not hurt child</b>	76.30 (1.25)	74.68 (2.82)	
<b>Pre-marital sex is at least sometimes wrong</b>	41.72 (1.66)	34.87 (2.83)	*
<b>Same-sex sex is at least sometimes wrong</b>	48.48 (1.64)	43.86 (3.23)	
<b>Abortion is OK for any reason</b>	44.67 (1.73)	48.89 (3.21)	
<b>Favor sex education in school</b>	91.79 (0.94)	93.20 (1.34)	
<b>Favor affirmative action</b>	23.25 (1.46)	23.38 (2.50)	
<b>Opposite race in neighborhood - Yes</b>	75.53 (1.50)	77.71 (2.63)	
<b>Allow a racist to speak</b>	60.98 (1.52)	56.80 (2.57)	
<b>Favor law for gun permits</b>	71.33 (1.62)	69.34 (2.57)	
<b>Favor capital punishment for murder</b>	59.91 (1.43)	62.28 (2.55)	
<b>Favor legalization of marijuana</b>	60.83 (1.69)	59.85 (3.43)	
<b>Political party</b>			
Democrat	33.04 (1.63)	32.89 (2.02)	
Independent	42.24 (1.32)	42.64 (2.26)	
Republican	22.25 (1.12)	21.45 (1.76)	
Other political party	2.46 (0.46)	3.02 (0.73)	

	Early Cases Percent (SE)	Subsampled Cases Percent (SE)	Difference
<b>Political views</b>			
Liberal	28.35 (1.32)	29.80 (2.03)	
Moderate	37.87 (1.40)	35.00 (1.95)	
Conservative	23.20 (1.53)	27.83 (2.80)	
<b>Government should improve standard of living</b>			
Government should help poor	33.81 (1.60)	30.24 (3.16)	
Government and self should help poor	42.99 (1.62)	41.92 (2.83)	
Poor are responsible to help themselves	23.20 (1.53)	27.83 (2.80)	
<b>Confidence in the Executive Branch</b>	57.05 (1.54)	58.78 (2.73)	
<b>Bible is at least the inspired word of God</b>	76.93 (1.09)	73.42 (1.90)	
<b>Did not attend church in the last year</b>	25.08 (1.16)	24.35 (1.85)	
<b>People can be trusted</b>	32.32 (1.60)	28.11 (2.51)	
<b>Too little national spending on...</b>			
Assistance for childcare	57.68 (1.46)	58.64 (2.33)	
Halting the rising crime rate	65.73 (1.76)	71.25 (2.69)	
Dealing with drug addiction	65.00 (1.98)	64.40 (3.13)	
Improving nation's education system	70.43 (1.61)	72.68 (3.27)	
Developing alternative energy sources	56.43 (1.46)	55.57 (2.35)	
Improving and protecting the environment	62.01 (1.61)	63.76 (3.47)	
Welfare	23.48 (1.44)	21.03 (2.52)	
Improving and protecting nation's health	63.99 (2.16)	63.76 (3.37)	
Mass transportation	37.00 (1.32)	38.75 (2.56)	
Improving conditions of Blacks	49.33 (1.77)	55.42 (3.41)	
Supporting scientific research	40.58 (1.42)	38.92 (2.09)	

\* p < 0.05, \*\* p < 0.01, \*\*\* p < 0.001, \*\*\*\* p < 0.0001. Sample size = 2,867. All estimates weighted using BALLOTFORMWTNR and used Taylor Series Estimation. "Difference" corresponds to a significant difference in the Rao-Scott chi-square test statistic.

The demographic differences for the 2018 GSS are more like those observed in the 2014 GSS despite having fewer completes obtained after subsampling (see Table 4A). Subsampled respondents were more likely to be age 35-44 and less likely to be age 65 or older, the latter which was significant in 2014. They were more likely to have a bachelor's degree and less likely to have a high school diploma. Full-time employment was more common among subsampled respondents while low-income households were less common. Single adult households were observed at a significantly lower rate among subsampled cases, opposite of the effect seen in 2016. Telephone completes are more comparable to 2014 accounting for 30 percent of the subsampled cases as opposed to ten percent for early respondents.

**Table 4A:** Comparison of Early and Subsampled Cases by Weighted Demographic Characteristics in the General Social Survey 2018

	Early Cases Percent (SE)	Subsampled Cases Percent (SE)	Difference
<b>Male</b>	45.76 (1.49)	46.36 (4.13)	
<b>Age</b>			
18-25	13.96 (1.31)	11.62 (2.23)	
26-34	17.19 (1.04)	17.34 (3.44)	
35-44	16.77 (1.04)	25.88 (3.40)	**
45-54	14.87 (0.89)	19.61 (3.43)	
55-64	15.77 (0.76)	18.72 (3.33)	
65+	21.44 (1.22)	6.83 (1.67)	****
<b>Black</b>	15.96 (1.41)	9.84 (2.14)	*
<b>Hispanic</b>	17.45 (1.64)	13.20 (2.73)	
<b>Education</b>			
Less than high school	12.55 (1.10)	6.60 (2.00)	*
High school graduate	50.88 (1.35)	44.14 (3.65)	
Some college but not bachelor's	8.52 (0.79)	6.98 (1.85)	
Bachelor's degree	17.95 (1.04)	28.14 (3.02)	***
Graduate degree	10.10 (0.95)	14.14 (2.47)	
<b>Adult in house</b>			
1 adult	18.09 (0.70)	13.73 (1.87)	*
2 adults	53.99 (1.33)	56.19 (4.32)	
3 or more adults	27.92 (1.48)	30.08 (4.20)	
<b>Children in household</b>	70.02 (1.57)	71.52 (3.30)	
<b>Currently married</b>	47.11 (1.55)	55.43 (3.96)	
<b>Ever divorced or legally separated</b>	29.48 (1.25)	26.20 (3.38)	
<b>Household income &lt;\$25,000</b>	23.81 (1.26)	15.54 (2.92)	*
<b>Full-time employment</b>	47.07 (1.37)	59.30 (3.69)	**
<b>Region</b>			
Northeast	15.53 (1.39)	19.99 (3.04)	
Midwest	21.85 (1.28)	20.64 (2.30)	
South	39.80 (2.09)	33.91 (3.79)	
West	22.83 (1.32)	25.46 (3.66)	
<b>In-person survey mode (vs. telephone)</b>	90.69 (0.87)	69.80 (3.59)	****

\* p < 0.05, \*\* p < 0.01, \*\*\* p < 0.001, \*\*\*\* p < 0.0001. Sample size = 2,348. All estimates weighted using BALLOTFORMWTNR and used Taylor Series Estimation. "Difference" corresponds to a significant difference in the Rao-Scott chi-square test statistic.

We see a couple of similar substantive differences between 2014 and 2018 including subsampled respondents more likely to favor capital punishment and less likely to feel there is too little spending on assistance for child care (see Table 4B). Subsampled respondents also were more likely to say they were at least pretty happy, more likely to agree that working moms do not hurt children, less likely to identify as a Democrat, more likely to think people can be trusted, and less likely to think too little is spent on welfare. All significant differences between early and subsampled respondents correspond to over a seven-percentage point difference.

**Table 4B:** Comparison of Early and Subsampled Cases by Selected Weighted Substantive Characteristics in the General Social Survey 2018

	Early Cases Percent (SE)	Subsampled Cases Percent (SE)	Difference
<b>At least pretty happy</b>	85.89 (0.99)	93.52 (1.74)	**
<b>Satisfied with financial situation</b>	77.14 (1.06)	81.85 (2.40)	
<b>Satisfied with job</b>	86.59 (0.96)	86.43 (2.77)	
<b>Working mom does not hurt child</b>	72.80 (1.36)	82.16 (3.67)	*
<b>Pre-marital sex is at least sometimes wrong</b>	36.57 (1.72)	34.28 (4.22)	
<b>Same-sex sex is at least sometimes wrong</b>	43.69 (1.99)	37.04 (4.88)	
<b>Abortion is OK for any reason</b>	49.88 (1.90)	53.36 (5.65)	
<b>Favor sex education in school</b>	91.18 (0.88)	94.60 (1.74)	
<b>Favor affirmative action</b>	26.62 (1.51)	21.24 (4.22)	
<b>Opposite race in neighborhood - Yes</b>	77.12 (1.50)	82.27 (2.96)	
<b>Allow a racist to speak</b>	58.24 (1.43)	57.35 (4.58)	
<b>Favor law for gun permits</b>	71.62 (1.55)	77.56 (4.43)	
<b>Favor capital punishment for murder</b>	62.04 (1.44)	69.83 (3.31)	*
<b>Favor legalization of marijuana</b>	64.21 (1.73)	69.29 (5.11)	
<b>Political party</b>			
Democrat	31.73 (1.33)	22.91 (3.20)	*
Independent	42.78 (1.66)	43.32 (4.23)	
Republican	22.23 (1.27)	27.86 (3.77)	
Other political party	3.26 (0.59)	5.92 (1.73)	
<b>Political views</b>			
Liberal	29.21 (1.10)	29.07 (3.83)	
Moderate	38.74 (1.08)	38.64 (3.84)	
Conservative	32.05 (1.17)	32.29 (3.22)	
<b>Government should improve standard of living</b>			



	Early Cases Percent (SE)	Subsampled Cases Percent (SE)	Difference
Government should help poor	31.21 (1.81)	30.71 (4.08)	
Government and self should help poor	45.47 (1.87)	44.51 (4.45)	
Poor are responsible to help themselves	23.32 (1.59)	24.78 (4.50)	
<b>Confidence in the Executive Branch</b>	54.87 (1.68)	56.54 (4.91)	
<b>Bible is at least the inspired word of God</b>	76.48 (1.27)	81.27 (2.97)	
<b>Did not attend church in the last year</b>	30.67 (1.24)	28.32 (3.61)	
<b>People can be trusted</b>	31.09 (1.69)	41.88 (4.80)	*
<b>Too little national spending on...</b>			
Assistance for childcare	60.95 (1.27)	52.83 (3.90)	*
Halting the rising crime rate	67.72 (1.76)	70.85 (5.40)	
Dealing with drug addiction	69.00 (1.53)	71.76 (4.36)	
Improving nation’s education system	73.99 (1.80)	78.72 (3.78)	
Developing alternative energy sources	57.81 (1.43)	60.32 (4.03)	
Improving and protecting the environment	65.74 (1.64)	72.51 (5.14)	
Welfare	25.77 (1.66)	16.10 (3.66)	*
Improving and protecting nation’s health	71.59 (1.50)	74.51 (4.21)	
Mass transportation	40.31 (1.33)	37.43 (3.92)	
Improving conditions of Blacks	55.75 (1.94)	54.90 (5.39)	
Supporting scientific research	46.76 (1.45)	46.92 (3.90)	

\* p < 0.05, \*\* p < 0.01, \*\*\* p < 0.001, \*\*\*\* p < 0.0001. Sample size = 2,348. All estimates weighted using BALLOTFORMWTNR and used Taylor Series Estimation. “Difference” corresponds to a significant difference in the Rao-Scott chi-square test statistic.

## Multivariate Results

Next, we examined the multivariate logistic regression models for the substantive variables focusing on the odds ratios and AMEs for the subsample indicator. For 2014 GSS, we see many of the significant effects of subsampling retained from the bivariate models after controlling for demographics including subsampled cases more likely to favor capital punishment for murder and to identify as conservative relative to moderate, and less likely to favor sex education in schools and to believe there is too little spending on child care (see Table 5A). Looking at the AMEs for these variables, subsampled respondents have on average a six-percentage point difference in their predicted probabilities. Controlling for demographics and mode removes the significant effect observed regarding mass transportation resulting in a decrease in predicted probability of only three-percentage points. We do see one additional significant difference appear in these models between early and subsampled respondents with the latter more likely to believe that sexual relations between two adults of the same sex is at least sometimes wrong, resulting in a seven-percentage point increase in the AME.

**Table 5A:** Odds Ratios and Average Marginal Effects for Subsampled Cases Regressed on Substantive Dependent Variables in the General Social Survey 2014

	Odds Ratio (CI)		Average Marginal Effect (SE)
<b>At least pretty happy</b>	1.18 (0.87, 1.61)		0.017 (0.015)
<b>Satisfied with financial situation</b>	1.02 (0.78, 1.34)		0.004 (0.024)
<b>Satisfied with job</b>	0.97 (0.73, 1.28)		-0.004 (0.018)
<b>Working mom does not hurt child</b>	0.80 (0.62, 1.03)		-0.041 (0.026)
<b>Pre-marital sex is at least sometimes wrong</b>	1.03 (0.82, 1.30)		0.008 (0.029)
<b>Same-sex sex is at least sometimes wrong</b>	1.34 (1.06, 1.70)	*	0.073 (0.030)
<b>Abortion is OK for any reason</b>	0.97 (0.77, 1.22)		-0.008 (0.030)
<b>Favor sex education in school</b>	0.54 (0.37, 0.79)	**	-0.048 (0.015)
<b>Favor affirmative action</b>	1.13 (0.78, 1.63)		0.017 (0.023)
<b>Opposite race in neighborhood - Yes</b>	0.97 (0.79, 1.18)		-0.006 (0.024)
<b>Allow a racist to speak</b>	0.84 (0.66, 1.08)		-0.041 (0.026)
<b>Favor law for gun permits</b>	0.97 (0.70, 1.34)		-0.007 (0.029)
<b>Favor capital punishment for murder</b>	1.32 (1.05, 1.65)	*	0.061 (0.023)
<b>Favor legalization of marijuana</b>	1.17 (0.90, 1.53)		0.040 (0.032)
<b>Political party</b>			
Democrat	0.93 (0.75, 1.14)		-0.016 (0.022)
Independent	0.93 (0.79, 1.11)		-0.017 (0.022)
Republican	1.24 (0.98, 1.57)		0.032 (0.019)
Other political party	0.88 (0.41, 1.87)		-0.002 (0.006)
<b>Political views</b>			
Liberal	0.98 (0.77, 1.25)		-0.003 (0.021)
Moderate	0.77 (0.61, 0.95)	*	-0.064 (0.024)
Conservative	1.36 (1.07, 1.72)	*	0.067 (0.023)
<b>Government should improve standard of living</b>			
Government should help poor	0.77 (0.57, 1.03)		-0.052 (0.027)
Government and self should help poor	1.09 (0.84, 1.41)		0.021 (0.028)
Poor are responsible to help themselves	1.17 (0.90, 1.52)		0.030 (0.027)
<b>Confidence in the Executive Branch</b>	0.86 (0.67, 1.09)		-0.038 (0.029)
<b>Bible is at least the inspired word of God</b>	1.25 (0.95, 1.65)		0.036 (0.019)
<b>Did not attend church in the last year</b>	1.08 (0.85, 1.35)		0.014 (0.021)
<b>People can be trusted</b>	0.91 (0.68, 1.22)		-0.019 (0.028)
<b>Too little national spending on...</b>			

	Odds Ratio (CI)		Average Marginal Effect (SE)
Assistance for childcare	0.78 (0.64, 0.95)	*	-0.063 (0.026)
Halting the rising crime rate	1.11 (0.81, 1.52)		0.024 (0.035)
Dealing with drug addiction	0.81 (0.61, 1.07)		-0.051 (0.035)
Improving nation's education system	0.88 (0.65, 1.20)		-0.025 (0.027)
Developing alternative energy sources	0.92 (0.74, 1.14)		-0.021 (0.025)
Improving and protecting the environment	0.83 (0.59, 1.15)		-0.047 (0.037)
Welfare	0.99 (0.69, 1.42)		-0.002 (0.028)
Improving and protecting nation's health	0.91 (0.68, 1.22)		-0.023 (0.034)
Mass transportation	0.87 (0.69, 1.09)		-0.034 (0.026)
Improving conditions of Blacks	0.82 (0.60, 1.12)		-0.045 (0.035)
Supporting scientific research	0.99 (0.82, 1.19)		-0.003 (0.024)

\* p < 0.05, \*\* p < 0.01, \*\*\* p < 0.001, \*\*\*\* p < 0.0001. Sample size = 2,538. All estimates weighted using WTSSNR and used Taylor Series Estimation. The additional independent variables for this regression model are sex, number of adults in the household, African American, Hispanic, education, age group, region, and survey mode. Significance test corresponds to a significant difference in the Rao-Scott chi-square test statistic.

For 2016, we see no significant odds ratios for the substantive variables relative to the subsample (see Table 5B). This means that the single difference observed previously was explained by demographic differences in the subsampled cases. Looking at the AME, subsampled respondents had nearly a six-percentage point lower predicted probability of believing pre-marital sex is at least sometimes wrong, one of the highest among the substantive variables examined for 2016 in this analysis, surpassed only by national spending on improving conditions of Blacks, which is not significant.

**Table 5B:** Odds Ratios and Average Marginal Effects for Subsampled Cases Regressed on Substantive Dependent Variables in the General Social Survey 2016

	Odds Ratio (CI)		Average Marginal Effect (SE)
<b>At least pretty happy</b>	1.29 (0.95, 1.74)		0.029 (0.017)
<b>Satisfied with financial situation</b>	0.95 (0.73, 1.24)		-0.010 (0.027)
<b>Satisfied with job</b>	0.74 (0.49, 1.10)		-0.033 (0.025)
<b>Working mom does not hurt child</b>	0.90 (0.63, 1.27)		-0.019 (0.030)
<b>Pre-marital sex is at least sometimes wrong</b>	0.79 (0.57, 1.08)		-0.057 (0.034)
<b>Same-sex sex is at least sometimes wrong</b>	0.98 (0.72, 1.32)		-0.006 (0.038)
<b>Abortion is OK for any reason</b>	1.18 (0.86, 1.61)		0.040 (0.036)
<b>Favor sex education in school</b>	1.14 (0.69, 1.88)		0.007 (0.014)
<b>Favor affirmative action</b>	1.07 (0.78, 1.48)		0.013 (0.026)
<b>Opposite race in neighborhood - Yes</b>	1.22 (0.85, 1.74)		0.032 (0.028)
<b>Allow a racist to speak</b>	0.87 (0.67, 1.12)		-0.034 (0.030)
<b>Favor law for gun permits</b>	0.84 (0.62, 1.15)		-0.034 (0.029)

	Odds Ratio (CI)	Average Marginal Effect (SE)
<b>Favor capital punishment for murder</b>	1.07 (0.82, 1.40)	0.016 (0.031)
<b>Favor legalization of marijuana</b>	1.03 (0.75, 1.43)	0.007 (0.038)
<b>Political party</b>		
Democrat	0.99 (0.78, 1.26)	-0.003 (0.026)
Independent	1.06 (0.85, 1.33)	0.015 (0.026)
Republican	0.88 (0.68, 1.13)	-0.019 (0.021)
Other political party	1.23 (0.63, 2.41)	0.005 (0.007)
<b>Political views</b>		
Liberal	1.13 (0.87, 1.46)	0.025 (0.025)
Moderate	0.86 (0.70, 1.07)	-0.034 (0.023)
Conservative	1.05 (0.84, 1.32)	0.011 (0.027)
<b>Government should improve standard of living</b>		
Government should help poor	0.86 (0.63, 1.18)	-0.033 (0.035)
Government and self should help poor	0.97 (0.73, 1.29)	-0.007 (0.033)
Poor are responsible to help themselves	1.25 (0.89, 1.75)	0.040 (0.030)
<b>Confidence in the Executive Branch</b>	1.19 (0.94, 1.50)	0.042 (0.031)
<b>Bible is at least the inspired word of God</b>	0.81 (0.65, 1.01)	-0.037 (0.022)
<b>Did not attend church in the last year</b>	0.98 (0.78, 1.23)	-0.004 (0.021)
<b>People can be trusted</b>	0.77 (0.57, 1.05)	-0.053 (0.031)
<b>Too little national spending on...</b>		
Assistance for childcare	1.05 (0.84, 1.31)	0.011 (0.026)
Halting the rising crime rate	1.29 (0.96, 1.75)	0.054 (0.031)
Dealing with drug addiction	0.95 (0.69, 1.30)	-0.012 (0.034)
Improving nation's education system	1.15 (0.80, 1.66)	0.027 (0.033)
Developing alternative energy sources	0.96 (0.79, 1.16)	-0.011 (0.026)
Improving and protecting the environment	1.06 (0.75, 1.50)	0.014 (0.038)
Welfare	0.90 (0.62, 1.30)	-0.018 (0.030)
Improving and protecting nation's health	0.96 (0.68, 1.36)	-0.009 (0.041)
Mass transportation	1.10 (0.85, 1.43)	0.023 (0.029)
Improving conditions of Blacks	1.42 (0.99, 2.03)	0.087 (0.042)
Supporting scientific research	0.93 (0.76, 1.15)	-0.017 (0.026)

\* p < 0.05, \*\* p < 0.01, \*\*\* p < 0.001, \*\*\*\* p < 0.0001. Sample size = 2,867. All estimates weighted using BALLOTFORMWTNR and used Taylor Series Estimation. The additional independent variables for this regression model are sex, number of adults in the household, African American, Hispanic, education, age group, region, and survey mode. Significance test corresponds to a significant difference in the Rao-Scott chi-square test statistic.

For 2018 GSS, we see some significant effects of subsampling retained from the bivariate models after controlling for demographics including subsampled cases reported being happier and more likely to support capital punishment (see Table 5C). Looking at the AMEs for these variables, subsampled respondents have a six- to seven-percentage point higher predicted probability of being at least pretty happy and a nine-percentage point higher predicted probability of favoring capital punishment. Controlling for demographics and mode removes the significant effects observed regarding working mothers, being a Democrat, believing people can be trusted, national spending on child care and welfare despite all of these still estimating a six to seven-percentage point change in the AME when switching from early to subsampled respondents. However, we see an additional significant difference between early and subsampled respondents with the latter more likely to believe that the Bible is at least the inspired word of God (AME: seven-percentage point increase).

**Table 5C:** Odds Ratios and Average Marginal Effects for Subsampled Cases Regressed on Substantive Dependent Variables in the General Social Survey 2018

	Odds Ratio (CI)		Average Marginal Effect (SE)
<b>At least pretty happy</b>	2.34 (1.32, 4.14)	**	0.072 (0.018)
<b>Satisfied with financial situation</b>	1.23 (0.83, 1.81)		0.033 (0.031)
<b>Satisfied with job</b>	1.06 (0.65, 1.74)		0.006 (0.024)
<b>Working mom does not hurt child</b>	1.45 (0.86, 2.45)		0.064 (0.041)
<b>Pre-marital sex is at least sometimes wrong</b>	1.05 (0.70, 1.58)		0.012 (0.048)
<b>Same-sex sex is at least sometimes wrong</b>	0.89 (0.55, 1.44)		-0.029 (0.056)
<b>Abortion is OK for any reason</b>	0.97 (0.62, 1.51)		-0.008 (0.060)
<b>Favor sex education in school</b>	1.06 (0.51, 2.20)		0.003 (0.021)
<b>Favor affirmative action</b>	0.91 (0.49, 1.67)		-0.018 (0.055)
<b>Opposite race in neighborhood - Yes</b>	1.40 (0.93, 2.11)		0.049 (0.032)
<b>Allow a racist to speak</b>	0.82 (0.56, 1.20)		-0.048 (0.049)
<b>Favor law for gun permits</b>	1.47 (0.84, 2.55)		0.069 (0.047)
<b>Favor capital punishment for murder</b>	1.51 (1.03, 2.20)	*	0.089 (0.038)
<b>Favor legalization of marijuana</b>	1.05 (0.65, 1.70)		0.011 (0.057)
<b>Political party</b>			
Democrat	0.71 (0.47, 1.08)		-0.068 (0.038)
Independent	1.02 (0.69, 1.50)		0.005 (0.047)
Republican	1.19 (0.78, 1.82)		0.027 (0.036)
Other political party	1.57 (0.78, 3.13)		0.010 (0.010)
<b>Political views</b>			
Liberal	0.95 (0.62, 1.46)		-0.010 (0.039)

	Odds Ratio (CI)		Average Marginal Effect (SE)
Moderate	1.06 (0.75, 1.48)		0.013 (0.040)
Conservative	0.97 (0.72, 1.32)		-0.006 (0.034)
<b>Government should improve standard of living</b>			
Government should help poor	0.98 (0.65, 1.49)		-0.004 (0.044)
Government and self should help poor	0.97 (0.65, 1.44)		-0.007 (0.047)
Poor are responsible to help themselves	1.06 (0.63, 1.79)		0.010 (0.044)
<b>Confidence in the Executive Branch</b>	1.15 (0.74, 1.81)		0.035 (0.054)
<b>Bible is at least the inspired word of God</b>	1.64 (1.10, 2.43)	*	0.071 (0.027)
<b>Did not attend church in the last year</b>	0.83 (0.57, 1.23)		-0.037 (0.040)
<b>People can be trusted</b>	1.35 (0.80, 2.27)		0.064 (0.055)
<b>Too little national spending on...</b>			
Assistance for childcare	0.74 (0.53, 1.04)		-0.072 (0.043)
Halting the rising crime rate	1.45 (0.82, 2.58)		0.074 (0.055)
Dealing with drug addiction	1.30 (0.77, 2.19)		0.051 (0.046)
Improving nation's education system	1.18 (0.70, 1.98)		0.027 (0.040)
Developing alternative energy sources	1.09 (0.76, 1.55)		0.021 (0.044)
Improving and protecting the environment	1.21 (0.68, 2.16)		0.038 (0.054)
Welfare	0.59 (0.32, 1.09)		-0.087 (0.042)
Improving and protecting nation's health	1.25 (0.70, 2.22)		0.040 (0.047)
Mass transportation	0.79 (0.58, 1.09)		-0.054 (0.039)
Improving conditions of Blacks	0.92 (0.57, 1.51)		-0.020 (0.061)
Supporting scientific research	0.98 (0.68, 1.41)		-0.006 (0.043)

\* p < 0.05, \*\* p < 0.01, \*\*\* p < 0.001, \*\*\*\* p < 0.0001. Sample size = 2,348. All estimates weighted using BALLOTFORMWTNR and used Taylor Series Estimation. The additional independent variables for this regression model are sex, number of adults in the household, African American, Hispanic, education, age group, region, and survey mode. Significance test corresponds to a significant difference in the Rao-Scott chi-square test statistic.

## Discussion and Conclusions

Subsampling, or two-phase designs, in survey research is intended to focus data collection efforts on a subset of sampled cases to improve response rates while controlling costs to obtain the hardest to survey respondents. Data collection over fifteen years allows the GSS to evaluate the impact of subsampling, particularly as it relates to reducing potential nonresponse bias while helping increase response rates. Our analysis compared demographic and substantive characteristics for those

interviewed before and after subsampling in GSS 2014, 2016, and 2018. The percentage of final sample attributed to subsampling decreased in just the three years examined dropping from over 30 percent of the unweighted sample to just ten percent. The lengthened field period (one and a half weeks) prior to subsampling may explain a portion of this reduction; but given the percent subsampled (50 percent of nonrespondents) has not changed over these years, this could indicate how difficult these hard-to-survey cases have become to obtain, which is consistent with anecdotal accounts from field staff. This idea is further supported given the corresponding reductions in response rates during these years, particularly between 2014 (69 percent) to 2016 (61 percent), highlighting that the cost and level of effort to complete field interviews among hard-to-reach respondents is growing.

Our first research question posited whether subsampled respondents differed on demographic characteristics from early cases. We found that there are many demographic differences between early and subsampled respondents that exist in the GSS providing positive affirmation for our question. We found that age, education, number of adults in the household, income, and employment were significantly different between the two phases in at least two of the years examined, and that sex and race were significant in at least one year of the three. This finding is consistent with previous research on both the GSS as well as other interviewer-administered surveys (e.g., Curtin, Presser, and Singer 2000; Keeter et al. 2000; Kirchner and Olson 2017). The increased proportion of telephone interviews during the subsampling stage is driven by the GSS design but illustrates how the offering of a secondary mode does make some difference in obtaining later completes, though that mode may not impact substantive estimates (see Appendix Table A2 for the corresponding odds ratios for survey mode from the multivariate models).

Our second research question asked whether there were substantive differences in key GSS variables. The results provide limited evidence for there being substantive differences based on the three years observed before controlling for demographic differences. Opinions on capital punishment and national spending on child care were the only two substantive variables where we observed significant differences in more than one examined year. However, our results also found that only a couple substantive differences in each year persist after controlling for respondent demographics and survey mode. Controlling for demographics and survey mode also had belief in the Bible as the word of God appear as significant difference between early and subsampled respondents in 2018, suggesting some conservative lean amongst subsampled cases despite the conservative political views not exhibiting any differences at any point in the analysis. Overall, our findings provide little support that subsampled respondents were different on substantive variables, especially after controlling for demographics, consistent with previous research.

The findings from our first two research questions illustrate the importance of adjusting for demographic nonresponse as a part of weighting to avoid biased results. The use of calibration weighting techniques, like post-stratification, adjust weights to make the final weighted sample reflect the population to help minimize biases while hopefully reducing variance as well (Little and Vartivarian 2005; Little 2007). GSS recently released post-stratified weights for all survey years (1972-2022) which will allow future analyses of GSS data to control for some of those differences.

Our findings suggest a weak, mixed response to the third research question concluding that demographic and substantive differences in subsampled cases were somewhat consistent for 2014 and 2018 but inconsistent when compared to 2016. The 2016 GSS only saw one significant demographic difference outside of survey mode while 2014 and 2018 saw multiple demographic differences. The singular demographic difference observed in 2016 was the number of adults in the households; but while 2016 saw fewer three-or-more adult households in the subsampled section, the opposite effect was observed in 2018 with more three-or-more adult households present. There was little consistency between which substantive variables saw significant differences between early and subsampled respondents. The overall lack of consistency may indicate that each year has differential needs in the second phase of collection.

This analysis has some limitations. We limited this evaluation to only three data collection years and a small subset of substantive variables. Future research should examine more GSS data collection years to try to better understand what may be causing the differences between early and subsampled respondents. Expanding the list of substantive variables would allow for a more complete evaluation of possible differences across the hundreds of questions asked each year. Future work should also examine GSS paradata and metadata to try to better understand what other factors (e.g., interviewers, incentives, number of contacts) may be also contributing to selection differences between early and subsampled respondents. Investigating the impact of the two-phase design on the final analysis weights is also worth exploring. Recent design changes, like the permanent introduction of web data collection in the 2022 GSS, also necessitate new examinations of the two-phase design.

While our analysis focuses on estimates, future work should examine cost data to see if the additional cost of obtaining responses from subsampled respondents is necessary, as subsampled respondents often cost more per case than early respondents. Given the decreasing yield by year for subsampled cases, it is possible that the high cost per complete may no longer justify the increase in response. For example, if the GSS did not pursue subsampled cases, it could afford to conduct more total interviews increasing the sample size of the survey; however, this would be at the expense of the overall survey response rate. Evaluating these tradeoffs for conducting GSS research is an important methodological investigation.



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# Appendix

Table A1: GSS 2014, 2016, 2018 Variables Used

Variable / response description	Originating variable name	Recoding (if applicable)
Subsampled	PHASE	
Male	SEX	
Age	AGE	18-25 = 18-25 26-34 = 26-34 45-54 = 45-54 55-64 = 55-64 65-89 = 65+
Black	RACE	2 = Black 1,3 = not Black
Hispanic	HISPANIC	2-47 = Hispanic 1,50 = not Hispanic
Education	DEGREE	
Adult in house	ADULTS	1 = 1 adult 2 = 2 adults 3-8 = 3 or more adults
Children in household	CHILDS	1-8 = Children in household 0 = No children in household
Currently married	MARITAL	1 = Currently married 2-5 = Not currently married
Ever divorced or legally separated	DIVORCE, MARITAL	(MARITAL = 3,4 or DIVORCE = 1) = Ever divorced or separated ELSE = Not ever divorced or separated
Household income <\$25,000	INCOME	1-11 = <\$25,000 12 = \$25,000 or more
Full-time employment	WRKSTAT	1 = Full-time employment 2-8 = Not full-time employment
Region	REGION	
In-person survey mode	MODE	
At least pretty happy	HAPPY	1-2 = At least pretty happy 3 = Not too happy
Satisfied with financial situation	SATFIN	1-2 = Financially satisfied 3-4 = Financially not satisfied
Satisfied with job	SATJOB	1-2 = Satisfied with job 3-4 = Not satisfied with job
Working mom does not hurt child	FECHLD	1-2 = Does not hurt child

Variable / response description	Originating variable name	Recoding (if applicable)
		3-4 = Does hurt child
Pre-marital sex is at least sometimes wrong	PREMARSX	1-3 = At least something wrong 4 = Not wrong
Same-sex sex is at least sometimes wrong	HOMOSEX	1-3 = At least something wrong 4 = Not wrong
Abortion is OK for any reason	ABANY	
Favors sex education in school	SEXEDUC	
Support affirmative action	AFFRMACT	1-2 = Support affirmative action 3-4 = Oppose affirmative action
Opposite race in neighborhood - Yes	RACLIVE	
Allow a racist to speak	SPKRAC	
Favor law for gun permits	GUNLAW	
Favor capital punishment for murder	CAPPUN	
Favor legalization of marijuana	GRASS	
Political party	PARTYID	0-1 = Democrat 2-4 = Independent 5-6 = Republican 7 = Other
Political views	POLVIEWS	1-3 = Liberal 4 = Moderate 5-7 = Conservative
Government improves standard of living	HELPPOR	1-2 = Government should help poor 3 = Government and self should help poor 4-5 = Poor are responsible to help themselves
Confidence in the Executive Branch	CONFED	1-2 = Confident 3 = Hardly any confidence
Bible is at least the inspired word of God	BIBLE	1-2 = At least the inspired word of God 3-4 = Not at least the inspired word of God
Did not attend church in the last year	ATTEND	0 = Did not attend church in the last year 1-8 = Attended church in the last year
People can be trusted	TRUST	1 = Can trust 2-3 = Can't be too careful/Depends
Assistance for childcare	NATCHLD	1 = Too little 2-3 = About right/Too much
Halting the rising crime rate	NATCRIME	1 = Too little

Variable / response description	Originating variable name	Recoding (if applicable)
		2-3 = About right/Too much
Dealing with drug addiction	NATDRUG	1 = Too little 2-3 = About right/Too much
Improving nation’s education system	NATEDUC	1 = Too little 2-3 = About right/Too much
Developing alternative energy sources	NATENRGY	1 = Too little 2-3 = About right/Too much
Improving and protecting the environment	NATENVIR	1 = Too little 2-3 = About right/Too much
Welfare	NATFARE	1 = Too little 2-3 = About right/Too much
Improving and protecting nation’s health	NATHEAL	1 = Too little 2-3 = About right/Too much
Mass transportation	NATMASS	1 = Too little 2-3 = About right/Too much
Improving conditions of Blacks	NATRACE	1 = Too little 2-3 = About right/Too much
Supporting scientific research	NATSCI	1 = Too little 2-3 = About right/Too much

**Table A2:** Odds Ratios for In-person Survey Mode Regressed on Substantive Dependent Variables in the General Social Survey

	2014 Odds Ratio (CI)	2016 Odds Ratio (CI)	2018 Odds Ratio (CI)
<b>At least pretty happy</b>	1.09 (0.67, 1.75)	1.08 (0.59, 1.99)	1.23 (0.70, 2.15)
<b>Satisfied with financial situation</b>	1.02 (0.78, 1.34)	0.55 (0.38, 0.81) **	0.78 (0.48, 1.27)
<b>Satisfied with job</b>	1.00 (0.64, 1.56)	0.57 (0.24, 1.35)	1.36 (0.88, 2.09)
<b>Working mom does not hurt child</b>	0.77 (0.50, 1.19)	0.88 (0.55, 1.40)	1.05 (0.63, 1.76)
<b>Pre-marital sex is at least sometimes wrong</b>	1.03 (0.66, 1.59)	1.38 (0.85, 2.25)	1.47 (0.97, 2.21)
<b>Same-sex sex is at least sometimes wrong</b>	1.04 (0.75, 1.44)	1.42 (0.88, 2.29)	0.75 (0.43, 1.30)
<b>Abortion is OK for any reason</b>	1.48 (0.98, 2.24)	1.13 (0.67, 1.91)	1.13 (0.73, 1.75)
<b>Favors sex education in school</b>	1.01 (0.61, 1.68)	0.94 (0.41, 2.16)	0.92 (0.43, 1.97)
<b>Support affirmative action</b>	0.99 (0.59, 1.66)	1.25 (0.71, 2.19)	1.40 (0.85, 2.32)
<b>Opposite race in neighborhood - Yes</b>	1.15 (0.77, 1.71)	1.27 (0.81, 2.00)	0.99 (0.67, 1.47)
<b>Allow a racist to speak</b>	0.93 (0.63, 1.38)	1.45 (0.85, 2.48)	0.87 (0.54, 1.39)
<b>Favor law for gun permits</b>	0.75 (0.50, 1.12)	0.72 (0.39, 1.32)	1.04 (0.63, 1.73)
<b>Favor capital punishment for murder</b>	1.25 (0.94, 1.67)	0.99 (0.66, 1.47)	1.29 (0.86, 1.93)
<b>Favor legalization of marijuana</b>	1.15 (0.80, 1.66)	1.16 (0.73, 1.85)	1.07 (0.70, 1.64)
<b>Political party</b>			
Democrat	1.05 (0.75, 1.46)	0.94 (0.61, 1.46)	1.10 (0.79, 1.53)
Independent	0.96 (0.70, 1.30)	1.13 (0.77, 1.66)	1.07 (0.77, 1.48)
Republican	0.94 (0.65, 1.36)	0.89 (0.55, 1.42)	0.84 (0.54, 1.30)
Other political party	1.80 (0.39, 8.30)	0.95 (0.44, 2.05)	0.85 (0.35, 2.07)
<b>Political views</b>			
Liberal	1.00 (0.72, 1.39)	1.23 (0.88, 1.72)	1.10 (0.75, 1.62)
Moderate	1.46 (1.02, 2.10) *	1.09 (0.77, 1.56)	1.07 (0.74, 1.53)
Conservative	0.69 (0.50, 0.95) *	0.76 (0.53, 1.08)	0.84 (0.59, 1.20)
<b>Government should improve standard of living</b>			
Government should help poor	0.80 (0.54, 1.18)	0.90 (0.61, 1.33)	1.19 (0.77, 1.84)
Government and self should help poor	0.96 (0.67, 1.38)	1.52 (0.98, 2.35)	0.95 (0.59, 1.54)
Poor are responsible to help themselves	1.35 (0.89, 2.05)	0.67 (0.38, 1.18)	0.84 (0.50, 1.41)
<b>Confidence in the Executive Branch</b>	1.36 (0.94, 1.97)	1.02 (0.60, 1.73)	1.01 (0.64, 1.58)
<b>Bible is at least the inspired word of God</b>	1.26 (0.87, 1.80)	1.19 (0.86, 1.66)	0.79 (0.56, 1.10)

	2014 Odds Ratio (CI)	2016 Odds Ratio (CI)	2018 Odds Ratio (CI)	
<b>Did not attend church in the last year</b>	0.91 (0.67, 1.23)	0.98 (0.68, 1.43)	0.95 (0.63, 1.44)	
<b>People can be trusted</b>	0.95 (0.62, 1.46)	0.74 (0.45, 1.21)	1.25 (0.73, 2.15)	
<b>Too little national spending on...</b>				
Assistance for childcare	1.25 (0.95, 1.66)	1.02 (0.70, 1.49)	1.16 (0.82, 1.65)	
Halting the rising crime rate	0.79 (0.56, 1.12)	1.18 (0.70, 1.98)	0.98 (0.56, 1.71)	
Dealing with drug addiction	1.14 (0.78, 1.67)	1.36 (0.81, 2.30)	1.29 (0.76, 2.18)	
Improving nation's education system	1.14 (0.78, 1.65)	1.29 (0.77, 2.17)	1.19 (0.69, 2.03)	
Developing alternative energy sources	0.85 (0.62, 1.15)	0.92 (0.60, 1.41)	1.40 (0.97, 2.00)	
Improving and protecting the environment	0.90 (0.60, 1.34)	0.76 (0.41, 1.41)	1.30 (0.72, 2.35)	
Welfare	1.26 (0.74, 2.15)	1.14 (0.57, 2.27)	1.21 (0.74, 1.96)	
Improving and protecting nation's health	0.99 (0.66, 1.49)	1.11 (0.58, 2.10)	1.80 (1.12, 2.91)	*
Mass transportation	1.34 (0.96, 1.85)	1.18 (0.77, 1.81)	1.19 (0.85, 1.65)	
Improving conditions of Blacks	1.44 (0.88, 2.35)	1.25 (0.67, 2.36)	1.15 (0.67, 1.97)	
Supporting scientific research	0.96 (0.72, 1.28)	1.38 (0.94, 2.04)	1.15 (0.82, 1.62)	

\* p < 0.05, \*\* p < 0.01, \*\*\* p < 0.001, \*\*\*\* p < 0.0001. All estimates weighted using WTSSNR (2014) or BALLOTFORMWTNR (2016 and 2018) and used Taylor Series Estimation. The additional independent variables for this regression model are sex, number of adults in the household, African American, Hispanic, education, age group, region, and subsampling status.