Sociocultural and Demographic Factors Influencing Support for Gun Control

490428362

1 Introduction

Divergent attitudes towards gun control in America are dependent on a range of sociocultural and demographic factors. A comparison of these classes of factors using logistic regression analysis will be conducted to determine whether sociocultural attitudes or demographic measures have a greater effect on explaining support for gun control. It is theoreticised sociocultural influences, that are the product of cultural norms and beliefs, will have a more significant effect on predicting gun control attitudes compared to demographic characteristics. These sociocultural influences are often intrinsically linked with values of individualism and freedom that permeate the American social fabric. Hence, these sociocultural factors such as membership with certain social groups and the perceived cultural significance of guns are predicted to be more significant than mere demographic measures such as sex or geographic location.

In this study, results indicate that on average, sociocultural factors such as political stance, engagement in hunting sports and gun ownership status had a comparatively stronger effect on support for gun control compared to demographic measures such as sex, race and location. That is, support for gun control is stronger amongst those with more liberal Democrat leaning political views, who did not participate in hunting sports or own guns, living in urbanised areas. Results also suggest that females and non-white communities were more likely to support gun control measures. Education level and one's faith in the government were found to be unrelated with support for gun control measures, challenging findings of earlier research. Ultimately, the results of this study largely support the findings of prior research in this area and offer a comparative approach to understanding the complex issue of gun control in America.

2 Literature and theory

Evidence suggests attitudes towards gun control are reflective of sociocultural "conflicts" (Kleck et al., 2009) across a range of issues. A report from the Pew Research Center cites political stance as an important factor that influences support for gun control measures (Parker et al., 2017). This is exemplified by the Republican party which has been strongly financially supported by the National Rifle Association (NRA) (Blendon, 1996) and who have "historically opposed gun control" (Wolpert & Gimpel, 1998). These findings suggest that individuals who align with the Republican party are likely to share similar a view on this issue. Prior research suggests that opposition to gun control is inherently linked to "conceptions of masculinity" (Lizette, 2019) and alignment to the "constitutional right to bear arms" (Spitzer, 2021), deeply rooted in the American male psyche. Proposed gun control measures are therefore likely to face opposition as they effectively pose a direct threat to this ideology and ultimately challenge the second amendment of the U.S Constitution. Similarly, individuals from "sporting subcultures" (Boine et al., 2020) such as hunting and shooting sports are more likely to own guns and consequently oppose gun control measures (Brennan et al., 1993). These attributes which are common to Southern U.S states may be explained by the "symbolic importance of guns in Southern culture" (Brennan et al., 1993). Hence, it is evident that sociocultural factors play a substantial role in explaining support for gun control measures.

Attitudes towards gun control are also influenced by demographic variables. Kleck et al (2009) note that education level is correlated with support for gun control as more educated individuals are "less likely to see a need for self-protection". Alternatively, Semet and Ansolabehere (2011) challenge this view and suggest educational background had minimal effect, along with income and age. Discrepancy in findings suggest that an interaction effect between education level and other variables such as location may be present. Kleck et al. (2009) report that race is an important factor with non-whites significantly less likely to support gun control measures as they are more likely to live in high crime neighbourhoods and therefore desire access to guns for self-protection. Historically, non-white minorities in the US have been the target of racially-motivated attacks which may explain this opposition to gun control measures. Gender is another factor that influences attitudes towards gun control, with males "more than 5 times as likely" as females to report gun ownership (Celinska, 2007). As highlighted by Lizotte (2019), perceptions of masculinity and gun ownership are closely related which may explain this interaction. This study will largely aim to support literature findings, with the exception of reported education level insignificance by Semet and Ansolabehere (2011) which will be contested. Therefore, research indicates that demographic factors shape attitudes towards gun control, and to what extent will be the focus of this study.

3 Data and methodology

Data provided by the General Social Survey (GSS) will be used in this study, which is a nationally representative survey of adults in the United States used to monitor and explain trends in opinions, attitudes, and behaviours. A total of 31 surveys were completed during the sample period from 1972 to 2016 and their responses are compiled in this dataset. Additional data sources will not be required due to the comprehensive nature of the GSS dataset measuring 62466 responses to 5895 questions over the entire sample period. Preliminary data analysis reveals minimal inconsistencies in the data, barring missing values; rendering major data transformations unnecessary. Variable recoding and renaming will be performed to convert numerical survey data into a more interpretable format (Appendix A).

The dependent variable `GUNLAW` is the response to the question: "Would you favor or oppose a law which would require a person to obtain a police permit before he or she could buy a gun?" which was selected as it is the "only question on the GSS that focuses on the respondent's attitudes toward gun control" (Celinska, 2007). Only responses that either clearly agree or disagree with the statement will be considered in this study to eliminate non-response bias. The independent variables will consist of both sociocultural attitudes and demographic features. These include political views, gun ownership status, participation in shooting activities, faith in government, gender, race, location, and education. These variables have been judiciously selected based on supportive literature (Section 2), ensuring an equal number of sociocultural and demographic variables for consistency when determining which class of variables is more effective at predicting support for gun control.

A binary logistic regression model will be built to assess the contribution of the selected demographic and sociocultural variables ability to explain support for gun control measures. This model is appropriate as the dependent variable of interest is a discrete binary outcome; support or opposition to gun control. Variables will be normalised to ensure consistency in measurement scales without distorting differences in the distribution. Once the model is trained, the proportion of statistically significant sociocultural and demographic variables will be compared to determine which class of factors have a greater effect on the outcome and test the hypothesis. In the event that the proportion of significant variable are equal, regression coefficients will be compared to determine which set of factors explain support for gun control better. Interaction effects (Section 2) will be considered prior to any conclusions made.

There are several limitations to this approach. One such limitation is the difficulty of separating sociocultural from demographic factors which are often closely related. For example, participation in hunting sports which has been denoted as a sociocultural factor in this study, is highly dependent on geographic location which is a demographic measure. Therefore, it is possible that confounding variables will obscure the true relationships between predictors and support for gun control.

4 Results

4.1 Descriptive Analysis

In this study, 40,472 responses to nine questions were used in the logistic regression analysis. Such a large sample size with eight predictors ensures that there is high statistical power to minimise the risk of committing Type II errors. In response to the dependent variable (Section 3), there were 9,536 responses of "No" and 30,936 responses of "Yes" to this question. At a preliminary level, this suggests that there is strong support for gun control measures across the U.S.
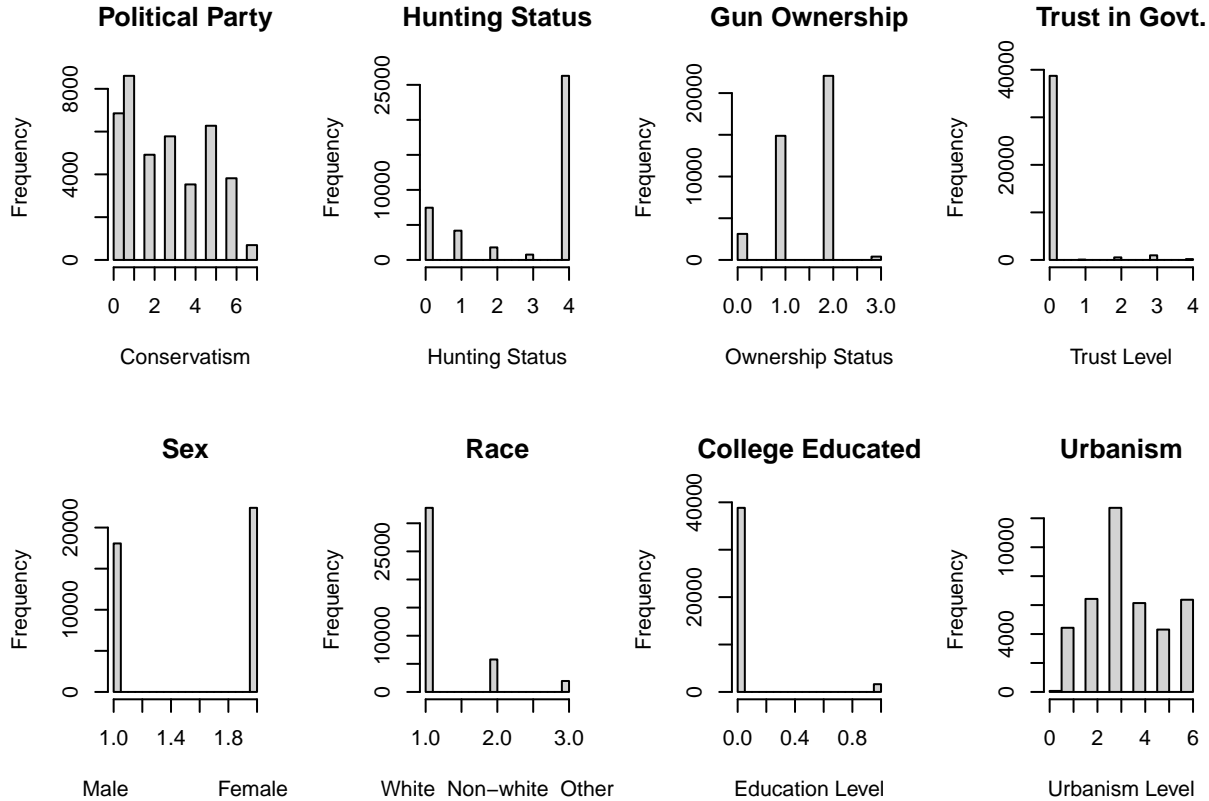

Figure 1: Independent variable frequency distributions

Inspecting the distribution of the variables, it appears that many of the responses are measured on various scales. This indicates that a process of normalisation will need to be applied prior to the regression analysis to standardise these values prior to regression analysis. We observe that a large number of respondents in this sample did not attend college (`college_educated` = 2), do not own a gun (`GUNOWN` = 2) and the majority do not engage in any hunting activities (`HUNT` = 4). There are more female responses (`SEX` = 2) than males in this sample.

Figure 2 presents a visualisation of the correlation between the predictors, there is a strong relationship between hunters and gun owners which is to be expected. It is interesting to note that none of the predictors are highly correlated with the dependent variable `GUNLAW`, potentially indicating that confounding variables may be an issue.
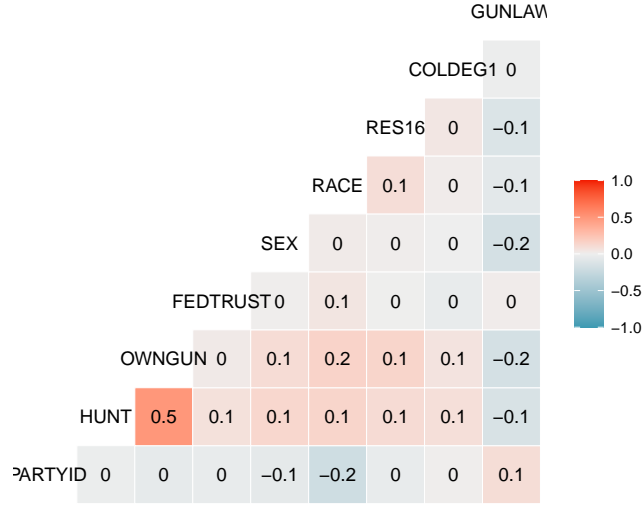
COLDEG1 0

RES16 0 −0.1

RACE 0.1 0 −0.1

SEX 0 0 0 −0.2

FEDTRUST 0 0.1 0 0 0

OWNGUN 0 0.1 0.2 0.1 0.1 −0.2

HUNT 0.5 0.1 0.1 0.1 0.1 0.1 −0.1

PARTYID 0 0 0 −0.1 −0.2 0 0 0.1

(Column headers, left to right: HUNT, OWNGUN, FEDTRUST, SEX, RACE, RES16, COLDEG1, GUNLAW)

Figure 2: Correlation matrix visualisation of the correlation between variables

4.2 Models

	support gun control			
Predictors	*Odds Ratios*	*std. Error*	*Statistic*	*p*
(Intercept)	6.57	0.24	51.18	**<0.001**
strong democrat	1.28	0.05	6.93	**<0.001**
hunting	0.54	0.02	-16.81	**<0.001**
faith govt	1.04	0.32	0.13	0.895
own gun	0.47	0.01	-29.55	**<0.001**
sex [Male]	0.58	0.01	-21.42	**<0.001**
race [White]	0.86	0.03	-4.19	**<0.001**
college educated	1.06	0.07	0.88	0.381
lives city	1.42	0.05	9.23	**<0.001**
Observations	40472			
R^2 Tjur	0.077			

Figure 3: Table 1

The equation of the fitted model using the sociocultural and demographic variables is given by:

$$\log\left[\frac{P(\widehat{\text{support\_gun\_control}}=1)}{1-P(\widehat{\text{support\_gun\_control}}=1)}\right] = 1.88 + 0.25(\text{strong\_democrat}) - 0.62(\text{hunting}) + 0.04(\text{faith\_govt}) -$$
$$0.76(\text{own\_gun}) - 0.55(\text{sex}_{\text{Male}}) - 0.15(\text{race}_{\text{White}}) + 0.06(\text{college\_educated}) +$$
$$0.35(\text{lives\_city})$$

The logistic regression estimates are presented in Table 1. From these results, political alignment with the

Democratic party was a statistically significant factor, with a p-value less than 0.001, indicating a strong relationship with support for gun control measures. Consistent with prior research, results indicate support for gun control measures were strongly related with individuals who lived in urban city centres. These results are closely related, with findings from the Pew Research Center highlighting urban communities are more likely to identify as Democrats (Parker et al., 2018). Therefore, there is likely a high correlation between respondents who live in urban areas and lean toward the Democrat Party. Similarly, these findings support the well-documented relationship between the Republican Party and NRA and the party's pro-gun stance.

Unsurprisingly, participation in shooting sports such as hunting were found to be strongly negatively related with support for gun control along with gun ownership status. It is clear as to why opposition towards gun control is so strong, as these measures effectively restrict the freedoms of these individuals who possess and use guns in hunting activities. Hunters, who have likely grown up in communities that value gun-related recreational activities would view these measures as a direct threat to their culture. It is worth noting that gun ownership and participation in hunting activities are strongly correlated (Section 4.1).

Race was found to be a key factor, with White Americans more likely to oppose gun control measures. These findings suggest that minority communities such as Black Americans and Hispanics are more likely to support gun control measures, as these groups have historically been targeted in racially-motivated gun-violence attacks. Another contributing factor may be the large proportion of White Americans living in the South with often more conservative views regarding racial equality and attitudes towards non-white communities. Men were less likely to support gun control measures compared to women, possibly due to the higher rates of gun ownership amongst men compared to women as reported by Celinska (2007) and greater participation in shooting sports.

Comparatively, support for gun control measures were found to be unrelated to whether an individual attended college. That is, an individual's education level has little bearing on their support for gun control measures. These findings support the reported insignificance of educational background by Semet and Ansolabehere (2011) in their analysis of attitudes towards gun control. Similarly, faith in the government was found be unrelated with support for gun control. This suggests that individuals who trust the government are comparatively as likely to support gun control measures compared to those with limited faith in the government.

The results indicate that sociocultural and demographic features have an equal number of statistically significant predictors. To determine which class of factors explains support for gun control better, an average estimated coefficient will be calculated for each of the two classes by computing the mean of absolute coefficient estimates (Appendix B). This captures the average expected change in log odds for a one unit increase in either sociocultural or demographic factors.

Sociocultural	Demographic
0.4175495	0.2745692

These results suggest that sociocultural factors, with a mean coefficient estimate of 0.418 have a greater effect on support for gun control compared to demographic factors with an average cofficient estimate of 0.275. That is, a one unit change in sociocultural factors on average, will increase support for gun control as opposed to a one unit change in demographic factors. However, it is important to note that an exact one unit change across multiple factors concurrently is difficult to quantify in practice.

5 Conclusion

To determine whether sociocultural or demographic factors have a greater effect on support for gun control measures, a logistic regression analysis was conducted using four sociocultural and four demographic measures. Of the four sociocultural measures, three were were found to be statistically significant. Results that highlight political alignment is a key factor support findings from Wolpert & Gimpel (1998) that political views significantly influenced gun control support. Similarly, engagement in hunting sports and gun ownership was identified as key factors, aligning with the conclusions of Brennan et al. (1993) who report that hunter communities were significantly more likely to oppose gun control policies.

Of the four demographic factors, gender was found to be significant, supporting parallel findings from Celinsk (2007) that females were more likely to support gun control. Findings that indicate race is a significant factor, with non-whites more likely to support gun control measures directly challenge findings from Kleck et al (2009) who conclude non-whites were less likely to support gun control policies. The insignificance of education level challenge the findings of Kleck et al (2009) and supports the view held by Semet and Ansolabehere (2011). Hence, the findings of this study largely provide supportive evidence to earlier research and offer alternate perspectives on the significance of certain variables.

There are several limitations of this study. Firstly, only opinions regarding gun purchase permits were used as a proxy to assess support for gun control measures. Responses to different gun control related questions may yield contrasting results. Secondly, the intended aim of the GSS was to capture opinions on a broad range of issues, not to exclusively measure factors that may affect gun control support. Finally, the selected sociocultural and demographic predictors used in the analysis were selected on the evidence of previous research and therefore using a different set of predictors is likely to produce disparate results.

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Appendix

Appendix A

Feature engineering code to extract meaningful variables for analysis

```r
## Sociocultural factors ##

# 0 corresponds to strong Democrat
predictors$strong_democrat = ifelse(predictors$PARTYID == 0, 1, 0)

# 6 corresponds to strong Republican
predictors$strong_republican = ifelse(predictors$PARTYID == 6, 1, 0)

# 1 represents respondent goes hunting
predictors$hunting = ifelse(predictors$HUNT == 1, 1, 0)

# 1 represents R trusts the federal govt. "just about always"
predictors$faith_govt = ifelse(predictors$FEDTRUST == 1, 1, 0)

# 1 represents R owns a gun in their own home
predictors$own_gun = ifelse(predictors$OWNGUN == 1, 1, 0)

## Demographic factors ##

# 0 represents R did not undertake any level of college education
predictors$college_educated = ifelse(predictors$COLDEG1 == 0, 0, 1)

predictors$sex = ifelse(predictors$SEX == 1, "Male", "Female")

predictors$race = ifelse(predictors$RACE == 1, "White", "Non-white")

# 6 represents R lives in a large city of over 250,000 people
predictors$lives_city = ifelse(predictors$RES16 == 6, 1, 0)

predictors$support_gun_control = ifelse(predictors$GUNLAW == 1, 1, 0)

selected_predictors = predictors %>% select("strong_democrat",
                                            "hunting",
                                            "faith_govt",
                                            "own_gun",
                                            "sex",
                                            "race",
                                            "college_educated",
                                            "lives_city",
                                            "support_gun_control",
                                            )
```

Appendix B

Calculating average estimated coefficients

```
Sociocultural = mean(abs(log.model$coefficients[2:5])) #sociocultural variables
Demographic = mean(abs(log.model$coefficients[6:9])) #demographic variables
knitr::kable(data.frame(Sociocultural, Demographic), "simple")
```