GAUGING GUN-BASED SOCIAL MOVEMENTS FRAMES: IDENTIFYING FRAMES THROUGH TOPIC MODELING AND ASSESSING PUBLIC ENGAGEMENT OF FRAMES THROUGH FACEBOOK MEDIA POSTS

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The lack of success of the gun control movement and the success of the gun rights movement in the United States have prompted research into the root causes. Although the political infrastructure, organizational resources, and public interest prove to be important factors in a social movement's success, how each social movement frames their arguments is extremely important for proposing policy initiatives and garnering support. In order to understand how gun control and gun rights organizations frame their arguments this study does two things: (1) performs topic modeling on the six gun control organizations' and three gun rights organizations' press statements to see the frames that each social movement engages in, and (2) identifying these frames in the most popular gun control and gun rights organizations on Facebook to predict likes, comments, and shares. This study is able to identify the top frames in the gun control and gun rights social movements and see how followers of each of these movements engage with each of these frames on Facebook.

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CHAPTER 1

INTRODUCTION

The United States is an anomaly when it comes to gun violence and gun-related deaths compared to other wealthy countries, such as those in the OECD (Grinshteyn and Hemenway 2016). As an example, in 2016, the number of gun-related deaths per population in the United States was 35.3 times of that in the United Kingdom, 10.6 times of that in Australia, 8.2 times of that in Sweden, and 5.0 times of that in Canada (The Global Burden of Disease 2016 Injury Collaborators 2018).

Although mass shootings only make up a fraction of gun-related deaths (Gramlich 2022), many of these incidents make national news and become nationally salient (Frosch and Johnson 2012; Vogel, Horwitz, and Fahrenthold 2012; Levenson 2018). Many nationally acclaimed news organizations such as The New York Times (Victor and Taylor 2021), The Washington Post (Berkowitz and Alcantara 2021), and CNN (Holcombe 2021) have started keeping track of mass shootings due to their social salience. Considering these highly publicized mass shootings, many news organizations have shifted their attention to the recent United States gun violence trends and gun culture, some calling it a “gun violence epidemic” (Aizenman 2018; Deliso 2021; Anon 2022).

In response to the high salience of gun violence and gun-related deaths in the United States, the public is largely in favor of gun-focused policy reforms. From recent Pew Research polls, the U.S. public has grown largely in favor of various gun-based policy reforms, such as preventing mentally ill people from owning firearms, requiring background checks for all private gun sales, creating a federal database of all gun sales, banning high-capacity ammunition magazines for firearms, and banning assault rifles (Schaeffer 2019; Doherty et al. 2021). In the

same Pew Research poll, more than 69% of Americans were found to support basic gun control measures, such as limiting places where concealed carry is allowed, increasing wait times for purchasing firearms, and restricting people from carrying a concealed weapon unless they obtain a permit. Americans have had favorable attitudes towards gun control policies consistently over the last five decades (Miller 2019). The proportion of those who hold attitudes have dropped in those who identify as a strong Republican since 2004, but still hold in the majority. In conjunction with most Americans supporting gun-based policy reforms, the number of households that own firearms has been steadily decreasing since the 1970s (Smith, Laken, and Son 2014; Schaeffer 2021).

The falling proportion of Americans who have a firearm in their household, increased salience of mass shootings in news, and the high support of gun-based policy reforms have occurred alongside limited changes to gun control policy reforms and defense of enacted gun control policy (Gray 2019). Gun-rights or "pro-gun" organizations such as the National Rifle Association (NRA) have been highly successful in protecting gun rights and preventing gun control measures from being passed (Patterson et al. 2007; Spitzer 2020; Goss 2020). This disconnect between a seemingly favorable public and a failure of the passage of gun-based policy reforms is coined as the "gun control paradox" by Kristen Goss (2006:6). Goss and other scholars have pointed out the significance of how social movements choose to frame their key issues (Benford and Snow 2000). Social movement frames are how an organization, or a movement conceptualizes what the main problems are, how they are going to solve the problems, and the urgency needed for solving said problems. For instance, Goss points to a decision to avoid grass-roots movements, how gun-related issues are framed, and the prescriptive strategy of

gun control advocates as the three main reasons stifling a gun control movement (Goss 2006; Goss 2020).

Yet, there have been specific frames that have resonated with the American public that have been translated into legislation. The Bipartisan Safer Communities Act (2021) is one such example where the legislation seeks to address the mental illnesses of mass shooters which have been attributed as a major contributor to the mass shooting itself (Goss 2015). In 2018, a shooter killed 17 at Stoneman Douglas high school in Parkland, Florida (Chuck, Johnson, and Siemaszko 2018). As a result, the sitting Republican President, Donald Trump, initially supported expansion of the federal background check system (Fabian and Savransky 2018). Despite high public support, and Presidential support, the Bipartisan Background Checks Act of 2019 died in the Senate (Thompson 2019). The death of Bipartisan Background Checks Act of 2019 illustrates the complicated relationship between public attitudes and legislative action. The idea of a favorable political environment cannot be reduced a few factors, but how the issues are framed, and the specific proposals of both the gun control and gun rights organizations prove to be important. For instance, scholars argue that the gun control movement has been largely stifled due to the strength of the gun rights voting bloc (Goss 2006; Spitzer 2020; Goss 2020).

Goss and others have underscored the importance of frames in both the gun control and gun rights movements. Yet, little is known about the frames included throughout the gun control and gun rights organizations. This study aims to answer two questions: (1) what are the frames used by gun control and gun rights organizations, (2) how does the public interact with these frames through Facebook posts? This first question will be answered by scraping press statements from six prominent gun control organizations and three prominent gun rights organizations from the early 1990s to 2022. These press releases will be analyzed through a

computational technique called latent dirichlet allocation (LDA) topic modeling. With topics returned from the LDA topic model, a framing theory-based qualitative analysis will allow for frames to be associated with each topic. More specifically, how gun control and gun rights organizations are framing the issues and the prescriptive strategies used will be identified. The second research question will be answered by first scraping Facebook posts from the most prominent gun control organization, Everytown for Gun Safety, and the most prominent gun rights organization, National Rifle Association. Scraping allows for the time of publishing, content, and engagement statistics (reactions, comments, and shares) of each post to be gathered. With this information from each post, the same LDA topic model that was trained to pick out frames in press statements will be used to infer frames in these Facebook posts. From this process, a dataset with posts, associated frames for each post, and the engagement statistics for each post will be attained. For the final step, an OLS regression with controls to gauge the various forms of engagement with each frame will be built. Although answering these questions does not fully elucidate the lack of gun control legislation, this study will seek to understand how the issues are framed, and the prescriptive strategies used by gun control and gun rights organizations to better understand possible explanations for a lack of an emergent gun control legislation.

Framing Theory

Goss points to framing as one of three main issues for the gun control movement's success. Yet, the frames within the gun control movement have rarely been studied even with the large amount of public data on the internet. Considering this, the main theoretical framework will be framing theory which is frequently used in the sociology social movement literature, along with the political science and communication theory literature as well.

Framing theory was first thoroughly conceptualized by Goffman (1974), in his book *Frame Analysis*. Goffman (1974) details a frame as the "definitions of a situation [that] are build up in accordance with principles of organization…and out subjective involvement in them" (p. 10-11). In other words, this "primary framework" or frame is used by individuals to "to locate, perceive, identify, and label" stimuli coming from their intimate environment (Goffman 1974:21).

Building on top of this, Snow et al. (1986) incorporated framing theory into the social movement literature. Before Snow and colleagues' contribution, the social movement literature a few leading theoretical frameworks: (1) classical theory, (2) resource mobilization theory, and (3) political process theory. Although resource mobilization contributed to the social movement literature by overcoming the simple grievances perspective offered by classical social movement theory (McCarthy and Zald 1977), Snow et al. (1986) argue resource mobilization still has three major downfalls. First, resource mobilization neglects the psychological perspective of grievances and assume a "ubiquity and constancy" of such grievances (Snow et al. 1986:465). Second, resource mobilization assumes grievances and other parallel psychological traits are static. Rather, Snow et al. (1986) argue grievances and other parallel psychological traits are "collective and [are a] ongoing phenomena" (p. 467). Finally, resource mobilization oversimplifies the psychological components to "one or two overarching microstructural or social psychological processes" (Snow et al. 1986:467).

In response to these failures by classical social movement theory and resource mobilization theory, Snow et al. (1986) proposed "frame alignment" as a continuous and dynamic process that occurs constantly before, during, and after a social movement. This concept of frame alignment falls perfectly to Goffman's concept of an individual's primary framework.

In early framing theory within the social movement literature, Snow et al. (1986) proposed four mechanisms by which frame alignment occurred: frame bridging, frame amplification, frame extension, and frame transformation. Benford and Snow (2000) give a more substantive theoretical framework in "Framing Processes and Social Movements." Benford and Snow (2000) argue in line with previous framing theory where framing is a continuous and active phenomenon where an individual makes sense of reality and their subjective perceptions. Furthermore, when a group of these individuals can identify similar frames and produce some sort of action from said frames, these are termed "collective action frames" (Benford and Snow 2000:614).

Benford and Snow (2000) identify three core framing tasks that are found in a social movement's collective action frames. The first is diagnostic framing that serves to identify a problem, the cause of such a problem, and the agents of blame. The second is prognostic framing (otherwise known as strategic framing) which serves to identify a potential solution to the problem and some method by which the solution could be implemented. The third is motivational framing which serves to entice the social movement's advocates to action.

Notably, there are three other concepts that will be important from Benford and Snow (2000) that will aide this study: (1) the concept of master frames, (2) the three dimensions of frame salience, and (3) the concept of counterframing. First, master frames are defined generic frames that can be found across social movements. A master frame, such as victimization, can then be used by a social movement to derive a more specific frame.

Second, Benford and Snow (2000) identify three dimensions that allow a frame to become salient. The first dimension is centrality, which depends on how critical the beliefs, values and ideas of a frame are to the individual or group. The more critical the beliefs, values,

and ideas, the more salient the frame will be. The second dimension is experiential commensurability, which asks how much of an individual's experience lines up with the frame. The more an individual's experience coalesces with the frame's purported reality, the more salient the frame will be. The third dimension is narrative fidelity, which asks how much of the society's cultural narratives line up with the frame. The more coherence of a frame with cultural narratives, the more salient it will become.

Third, review the concept of counterframing, which is a subset of contested framing processes (Benford and Snow 2000). Counterframing is a process by which opponents or outsiders of a social movement use framing to diminish, distract, or neutralize the frames of a social movement. Counterframing can be viewed as a rhetorical counterargument to a social movement's initial arguments. Within the gun control and guns rights movements, the gun control movement can be conceptualized as the primary social movement attempting to change the status quo in American society. Therefore, the guns-rights movement can be conceptualized as the predominant source of counterframing. This being said, the gun control movement can also participate in their own counterframing efforts against gun rights rhetoric.

History of the Gun Control Movement

Goss (2006) performed a historical analysis on the (lack of a) gun control movement in the United States from the late 1960s to the 2000s. Goss (2006) argues that there were "movement moments" yet no true grass-roots gun control movement was formed in America (p. 21). Goss identifies five separate movement moments in the span of the late 1960s to the 2000s, which included the assassination of the most salient public figures (such as President John F. Kennedy and Reverend Martin Luther King Jr.) and the increase in the homicide rate and gun-related crime in the 1980s. Goss (2006) terms this unpredictable lack of a social movement the

"gun control participation paradox" (p. 8). Goss (2006) provides three major factors that social movements have historically "socialized costs and personalized benefits:" (1) securing resource patrons, (2) issue framing, and (3) adopting an incremental political strategy rather than a wholesale strategy (p. 51). Although Goss (2006) initially states that these factors function independently, in a later follow-up on the gun control movement (Goss 2020), she refined these factors to be inter-dependently linked.

First, for gun control organizations, securing resource patrons have been difficult due to two fronts: governmental and public. On the governmental side, agencies and organizations that may have helped the gun control movement in one way or another (such as the Consumer Product Safety Commission, the Bureau of Alcohol, Tobacco, and Firearms, and the Center for Disease Control and Prevention) have been stifled by the National Rifle Association and other gun rights organizations. Such intense lobbying by the National Rifle Association is afforded by their strong membership, amounting to more than 4 million members in 2002 and 5.5 million members in 2018 (Goss 2006; Gutowski 2019). From the public front, Goss (2006) explains that gun control advocates refused to take a similar strategy to Mothers Against Drunk Driving (MADD). Instead, early gun control advocates "made a conscious decision not to build chapters," leading to a lack of support for grass-roots gun control movements on the local and state levels (Goss 2006:91).

Second, Goss argues that gun control organizations made a misstep when they opted to frame the main issue as crime and crime control rather than a "victim-based" movement like Mothers Against Drunk Driving (Goss 2006:91). Goss mentions that in the mid-1990s gun control organizations shift their frame from crime to child protection. The rise of the Million Moms March (MMM) as a reaction to the California day care shooting in 2000 marked this

change. Led by Donna Dees-Thomases, MMM was launched as an online group called “One Million Moms for Gun Control” (Goss 2020:143). MMM went on to create 107 chapters in 34 states (Goss 2006: 124). Goss uses the National Gun Policy Surveys in 1996 and 1999 to show that alongside this shift from the crime frame to the child protection frame, there was substantial increase in women who have joined a gun control organization, gave money to a gun control organization, or wrote to an official advocating for gun control (Goss 2006: 131).

Third, Goss argues early gun control advocates did not take a policy incrementalism approach (Goss 2006: 145) but rather sough a “rational national” approach (Goss 2020: 145). The “rational” comes from early gun control advocates seeking to implement policies that would not allow for any loopholes. The “national” comes from early gun control advocates focusing on federal-level policy implementation and enforcement. Goss (2020) argues that one ramification of the “rational national” approach to gun control policy was that this “threatened large numbers of everyday citizens who owned guns and used them responsibly” allowing gun rights groups to create a threat-based frame from this (p. 145). Later Goss (2020) states that by the 2010s, gun control organizations (now largely reframed as gun violence prevention organizations) started to opt for the policy incrementalism strategy.

Notably since Goss’ 2006 book *Disarmed,* there have been many substantive changes that affect the possibilities of an emergent gun control movement. First, the rise of the internet cannot be understated. Goss (2020) in a follow-up, remarks that the Million Moms March and the Moms Demand Action (formed as a response to the Sandy Hook shooting) were both formed as a result of the internet. More specifically, Goss argues that the internet provided the infrastructure of collective action in both cases. The Million Moms March took advantage of a

"website and email listservs," whereas Moms Demand Action took advantage of Facebook and Twitter for collective mobilization (Goss 2020:143).

Following Goss' coverage of the gun control movement in the early 2000s, other scholars have looked into gun politics and the gun-based activist movements. Melissa Merry has delved into gun control and gun rights movements and how they frame policy narratives. Using the narrative policy frameworks, Merry has analyzed how gun-based movements have framed their arguments on social media. First, Merry finds on Twitter that successful frames include a victim, villain, and setting that is attached to a push for a specific policy (Merry 2015). On Twitter, Merry found that more than the villain of a specific situation being emphasized, the victims are the ones being pushed forward in the frame. This even works for counterframing situations, where for instance the National Rifle Association applauds the "good guy with a gun" that intervened in a shooting. Merry finds that even though gun control and gun rights groups often digest the same events, such as upcoming legislation or salient gun-related news, both sides avoid cross-cutting interactions (Merry 2016). Therefore, these groups on social media act as silos for gun control and gun rights activists due to homophilous sorting and lack of interaction across the two sides. In the two sides, Merry finds gun control organizations have a heavy focus on child victims and mass shootings, and gun rights organizations predominately focus on self-defense shootings and justification (Merry 2015, Merry 2018, Merry 2020).

Finally, there have been many notable shifts in the gun control debate since the 1970s. First, many of the gun control initiatives that passed in the 1990s, which were bolstered since the 1970s were framed to combat criminals with firearms (Jacobs 2002, Goss 2006, Carlson 2015). For instance, the Federal Assault Rifle ban of 1994 was argued for by a pro-police base who wanted to reduce the number of police being shot in action (Schumer 1994, Carlson 2015, Quinn

2022). Even though gun control organizations are predominately afraid to bring up race (Merry 2018, Merry 2020), some gun control organizations have started arguing that police violence is gun violence which is disproportionately against minorities (Carlson 2015, Carlson 2020). Moreover, there has been a shift from an emphasis of the perpetrators to a more mixed emphasis of acknowledging both the perpetrators and the victims of gun violence on both the gun control and the gun rights sides. Second, mass shootings have been regarded as focusing events where a shooting such as Colombine or Sandy Hook take place, a big public reaction to the event occurs where the public demands some legislative actions, the legislative body is active but is eventually blocked, and the national attention is pointed elsewhere (Goss 2006, Fleming et al. 2016, Merry 2020, Spitzer 2020). As these mass shootings have become more frequent, the public has become more desensitized to these shootings and most mass shootings do not act as a focusing event (Merry 2015). In fact, after the most salient mass shootings (such as Colombine, Sandy Hook, Newtown, Las Vegas, and more) the public attitude on gun control policies are not swayed in any direction (Birkland & Lawrence 2009, McGinty et al. 2016, Wozniak 2017, DeFoster & Swalve 2018, Kantack & Paschall 2020). The only factors that impact the public's attitudes on gun control positively are if gun violence is proximate, recent, and repetitive (Newman & Hartman 2019).

There are a variety of factors that influence gun politics in the United States. A recent comparison between Canada and the United States gun debate shows that there is a higher level of policy polarization in the United States than in Canada (Fleming, McLean, and Tatalovich 2018). There are cultural factors in the United States that distinguishes itself from other nations such as the Scots-Irish honor culture that promotes honor killings (Berthelot, Blanchard, and Brown 2008, Grosjean 2014, Carlson 2015) and the American mythic tradition behind owning

guns (Jacobs 2002, Goss 2006, Carlson 2015, Carlson 2020, Merry 2020, Spitzer 2020). Americans also believe that violent crime is increasing which allows the self-defense rhetoric from the gun rights organization to be very effective (Jones 2010, McGinty et al. 2016). Resource differences in the gun control organizations and the gun rights organizations can also lead to different impacts on the public participation and political influence (Goss 2006, Carlson 2015, Goss 2020, Merry 2020, Spitzer 2020, Laschever and Meyer 2021). Even with the consistent positive attitudes on gun control policies (Erskine 1972, Smith 2002, Miller 2019), scholars point to an elite-level polarization from politicians and news-media on gun control initiatives (Berkland & Lawrence 2009, Miller 2019, Rogowski and Tucker 2019). Some scholars point to framing from these elite-level sources as crucial for policy initiatives and success of either the gun control or gun rights organizations (Jacobs 2002, Goss 2006, Merry 2015, Goss 2020, Merry 2020, Spitzer 2020). For instance, Wozniak (2017) found that after the Sandy Hook shooting attitudes about gun control initiatives did not change but the best predictors for opposition to gun control measures were the person's opinion on the NRA and if they were conservative or not.

Current Study

Although many factors contribute to the success or limitations of gun control and gun rights social movements, framing is one component that has been consistently found to play a major role, both in shaping public discourse and swaying public opinion (Jacobs 2002, Goss 2006, Carlson 2015, Merry 2015, Goss 2020, Merry 2020, Spitzer 2020). Although scholars have identified a variety of frames used in these debates, there has been little direct attention to identifying this heterogeneity. Correspondingly, we know less about the direct relationship of frames to public engagement.

Advancing these questions, this study aims to (1) understand the dominant frames used in each social movement, and (2) understand how these dominant frames are engaged by the public on Facebook.

To tackle the first point, this study aims to scrape the top six gun control movements' and the top five gun rights movements' press statements. By targeting this set of press statements, this study will be able to identify frames and encompass the dominant threads in the social movements. To find and understand the dominant frames, latent dirichlet allocation (LDA) topic modelling will be used on the press statements. Although qualitative content analysis has been used for gun control and gun rights press statements before, using LDA topic modeling will allow for the amount of data to be classified in a more efficient and consistent manner. Finally, by gathering Facebook data from the most prominent gun control and gun rights organizations, this study aims to find the frame used in each post and compare how the post is engaged (through likes, comments, and shares). By inspecting how well the frames perform with respect to social media engagement, this study aims to learn more about which types of frames work better than others.

CHAPTER 2

MATERIALS AND METHODS

Methodology Pipeline

This study's methodology is illustrated in Figure 1. The blue path outlines scraping social movement organizations' (SMOs') press statements, cleaning the data, and training a topic model on the press statement. This will result in a trained topic model that identifies predominant frames (identified as topics in the LDA model) used by gun control and gun rights organizations. The frames are characterized by differences in the types of words most predominant in each. From this topic model, topics can then be qualitatively associated to the appropriate frame. The labeled press statements dataset will allow for a detailed analysis of frame prevalence over time in press statements and the frame proportion of each SMOs' press statements. This descriptive frame analysis will allow us to attend to the first research question. The green path outlines the process for the second question, beginning with scraping the Facebook page of the most prominent gun control organization, Everytown for Gun Safety, and the most prominent gun rights organization, the National Rifle Association. The Facebook posts will be cleaned in a similar fashion to how the SMOs' press statements were cleaned. With a cleaned dataset of Facebook posts, the topic model that was built in the blue path will be used to infer frames elicited in each Facebook post. After this process a dataset with each Facebook post along with the frame proportion in said post will be compiled. In the final step, I use frames to predict each posts engagement statistics (such as likes, reactions, comments, and shares) using a series of OLS regression models. By doing so, I examine how each frame leads to an increase or decrease in each engagement statistic.

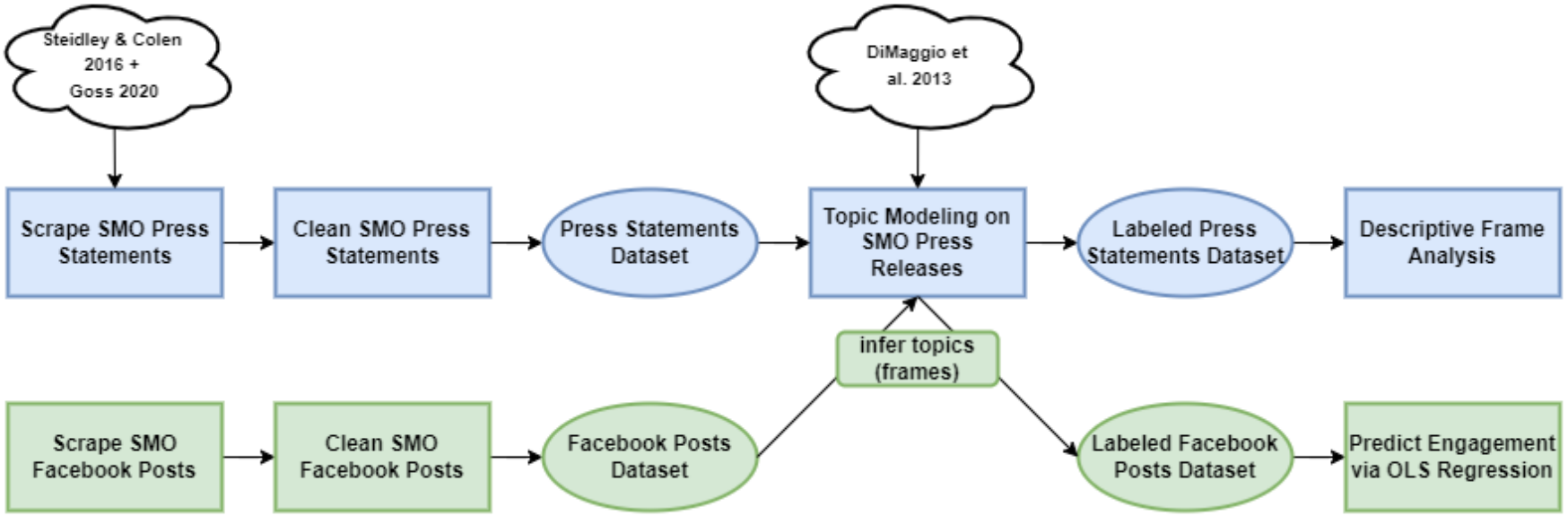


Figure 1: The Methodology Pipeline.

Data

In Goss' (2020) follow-up to her book on the missing gun control movement, she identifies the six most prominent gun control organizations and the three most prominent gun rights organizations (p. 142). The most prominent gun control organizations are Everytown for Gun Safety, the Brady Campaign to Prevent Gun Violence, Giffords, the Coalition to Stop Gun Violence, the Sandy Hook Promise, and the Violence Policy Center. The most prominent gun rights organizations are the National Rifle Association (NRA), the Gun Owners of America, and the Second Amendment Foundation.

Therefore, the aforementioned six gun control organizations and three gun rights organizations are the social movement organizations that will represent the gun control movement and gun rights movement, respectively. To gauge each movement's overarching frames, this study will follow from Steidley & Colen (2017). Steidley and Colen (2017) did a qualitative content analysis on press statements from the National Rifle Association and the Brady Campaign. The authors built upon existing literature to argue that frames could be gathered from an organization's press statements. Arguing along these lines, press statements can serve as a mechanism where an organization is reorienting the stimuli around them. For instance, when a mass shooting occurs this serves as stimuli. Subsequently, the organization will digest these stimuli by having internal conversation in leadership and down to the marketing or press release team. After the appropriate reaction is consolidated, they will create a press statement along those lines. Thus, the press statements can be interpreted as mechanisms that allow organizations to process stimuli, orient their values, and convey their values to those outside the organization. With this in mind, frames should certainly be found within the press statements of the gun control and gun rights organizations. Therefore, press statements from our selected gun

control and gun rights organizations will be targeted as the main corpus.

The press statements from the 6 gun control and 3 gun rights organizations were scraped from each of the organizations own website during the month of April 2022. The entire history of press statements that were available online were collected from each of these organizations. In total, there are 7,332 press statements from gun control organizations and 9,355 press statements from gun rights organizations. All of the press statements went through an initial cycle of sanity checks and cleanings. For sanity checks, this included processes such as making sure there are not any errors from the method, blank entries, and that the press statement is in English. For cleaning, this includes processes such as making sure there are not any raw code artifacts, and formatting the date from the different sources. These processes are written in more detail in Appendix A. Although there was a rigorous method of cleaning the datasets, it is important to note that there is not a definitive method to ensure no errors. There are many possible points of failure such as scraping the wrong parts of the webpage, leaving in erroneous text that is not a part of the press statement, and collecting duplicates of the same press statement. Finally, the cleaned press statements are organized into a gun control and gun rights dataset.

LDA Topic Modeling Methodology

The next step in the process is latent dirichlet allocation (LDA) topic modeling (Blei, Ng, and Jordan 2003). As Blei and colleagues (2003) introduce, LDA topic modeling accepts a preprocessed dataset of text, a number of topics (determined by the user), and two hyperparameters. Our press statements dataset will go through a standard preprocessing procedure as detailed below and in other research using topic models (Blei et al. 2003; DiMaggio, Nag, and Blei 2013; Scarborough and Crabbe 2021).

The topics in the LDA model and press statements dataset are able to be interpreted as

frames due to the fact that our dataset is specific. First, Mohr and Bogdanov (2013) argue that topic modeling is able to extend what qualitative content analysis sought out to do. Acknowledging, the strengths and weaknesses of each method, the authors mention both methods are "perfect bookends" where topic modeling is applicable to "modern content analysis" where big data is a hurdle (Mohr and Bogdanov 2013:564). Second, DiMaggio and colleagues (2013) argue that topic modeling is able to pick up on frames. The authors state when a dataset "that cover[s] particular issue domains, topic modeling has some decisive advantages for rendering operational the idea of 'frame' in media research" (DiMaggio et al. 2013:593). Furthermore, DiMaggio and colleagues argue that since LDA topic models are multiple-membership models (where many topics can be found in one corpus), it meshes well with the finding topics or frames in press documents. Lastly, there have been previous research in political science and communication science that have used topic models to identify frames (Dehler-Holland, Schumacher, and Fichtner 2021; Stelmach and Boudet 2021; Walter and Ophir 2021; Zhang, Wang, and Hu 2021) Therefore, through our qualitative inspection process detailed above, the frames popular in gun control or gun rights discourse can be distinguished. For instance, previous research has identified important frames within the gun control/rights discourse such as health activism (DeFoster and Swalve 2018, Zoller and Casteel 2021, McKeever et al. 2022), mental health (Goss 2015), gun violence prevention (Jacobs 2002, McMillan and Bernstein 2022), or many other frames (Fleming et al. 2016; Cook and Goss 2020, Merry 2020) and apply these frames to our topics.

The optimal LDA model is built in the following method: (1) building models with 2 to 20 topics, (2) identifying the best match between a relatively high coherence score and different topic specifications, (3) hyperparameter tuning, (4) repeat step two with the most optimal

hyperparameters (stated in more detail in Appendix A). The coherence metric measures the degree of semantic similarity of the words found in a topic (Röder, Both, and Hinneburg 2015). Moreover, the coherence metric (opposed to other measures such as log-likelihood, cosine distance, or perplexity) has been found to maximize the interpretability of topics (Scarborough and Crabbe 2021).

CHAPTER 3

LDA TOPIC MODELING RESULTS

Identifying the Best Gun Control LDA Model

I first conducted a series of topic models on press statements made by gun control organizations. By building models with topics 2 to 20, the coherence score of each of the models is graphed in Figure 2. The optimal model will be the point at which there is diminishing returns. By looking at Figure 2, the model with six topics will be the optimal model for gun control organizations.

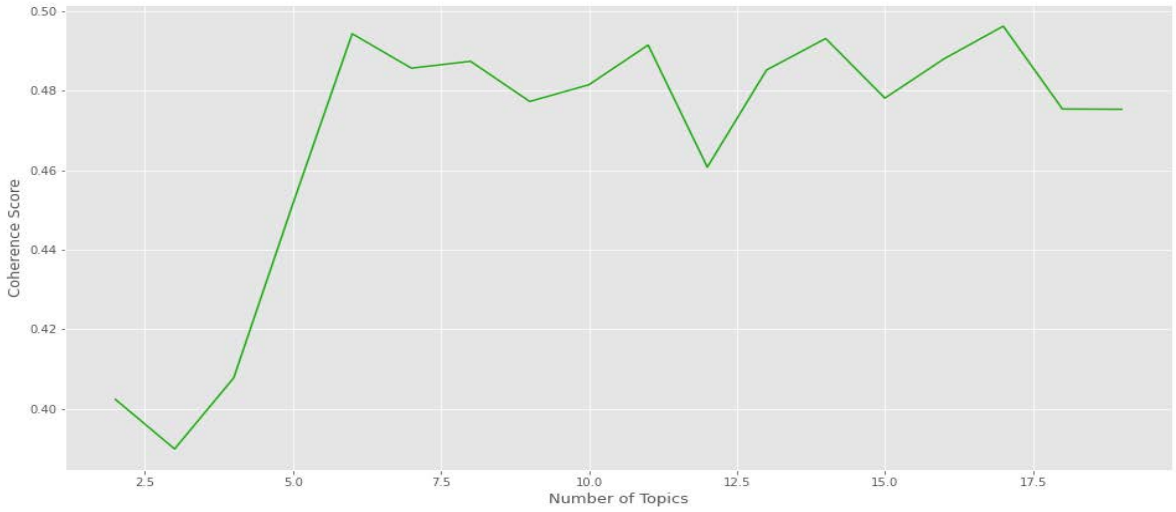


Figure 2: Coherence per Number of Topics in LDA Model for Gun Control Organizations.

Gun Control Press Statements' Topics

The best LDA model results for gun control press statements are shown in Table 1. Within this table, there is the topic number, some excerpts from each topic, the identified frame, and the ranked top words in the topic.

The first topic from the gun control press statements is specifically about concealed carry in various states. Concealed carry has proven to be a major topic in the gun control social movement space due to the increasing number of states that allow some extent of concealed

carry. The number of states that allowed concealed carry went from 18 to 41 states in the last three decades (Siegel et al. 2017). The second topic, Violence & Victims, focuses on studies and statistics about gun violence in the United States. Here there are mostly reports on how gun violence affects various communities and the statistics behind the gun violence. This topic takes a sociological perspective with gun violence and can be seen to echo gun violence as an epidemic or a health issue (DeFoster & Swalve 2018, McKeever et al. 2022). The third topic is mostly about congresspeople and bringing attention to those who are for gun control and those who are "funded by the NRA." There were a tiny portion of press statements that targeted the NRA's defeats in this topic as well. The word "NRA" is kept in this topic due to how often the NRA is brought up in light of congresspeople.

The fourth topic targets the firearm industry and the regulatory body, the Bureau of Alcohol, Tobacco, Firearms, and Explosives (ATF or BATF). This is often brought up with the Public Safety and Recreational Firearms Use Protection Act of 1994 which banned assault rifles (Schumer 1994). This successful gun control measure failed to be renewed in 2004 but is still being brought in front of congress, such as the Assault Weapons Ban of 2022 (Cicilline 2022). The fifth topic covers background checks and the "gun show loophole." The gun show loophole refers to the fact that private gun sales are not subject to background checks. In 2020, the Bipartisan Background Checks Act of 2019 attempted to cover this but died on the desk of Senate majority leader Mitch McConnell (Thompson 2019). The sixth topic is about the coverage of school shootings and mass shootings. Although mass shootings and school shootings only take up a portion of gun-related deaths (Global Burden of Disease 2016 Injury Collaborators 2018), the frequency of such events has increased over time (Shahid and Duzor 2021).

Table 1: Gun Control Organizations Press Statement Topics/Frames

Topic No.	Example Text	Frame	Words in Topic
1	• "a bill which allows 18-, 19-, 20- year olds to obtain permits to carry concealed handguns in public" • "would eliminate Ohio's concealed carry handgun license requirement – a dangerous rollback that has been shown to increase gun violence in other states and is staunchly opposed by law enforcement across Ohio"	Concealed Carry	conceal, carry, hand, law, state, bill, public, permit_holder, enforcement, allow
2	• "A gun is by far the most common weapon used to kill black victims of homicide in America" • "Nine out of 10 black women murdered by men are killed by someone they know, most often with a gun, according to the new study When Men Murder Women: An Analysis of 2015 Homicide Data"	Violence & Victims	violence, rate, homicide, state, victim, death, woman, percent, domestic, prevention
3	• "Volunteers showed up in areas from the 10th Congressional District of Virginia, where Jennifer Wexton seeks to unseat NRA A-rated Congresswoman Barbara Comstock" • "Action Fund and Victory Fund Spent More Than $4.2 Million in Georgia this Election, in Partnership With House Majority PAC, Including Nearly $3 Million to Support Rep. McBath, Successfully Defeating NRA-Backed Karen Handel"	Elections & NRA	nra, safety, support, make, say, violence, lobby, work, voter, vote
4	• "Minnesota Gunmaker Offers Widest Range of "Copycat" Assault Weapons including AK-47s, AR-15s, MAC-10s, Galils, and MP5s of any Manufacturer in America, Illustrates Need to Strengthen Federal Assault Weapons Ban" • "The firearms industry and gun lobby are fighting a battle of their own creation with the federal Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF) according to a new report"	Firearm Industry	firearm, law, industry, weapon, ban, injury_follow, study, use, federal, assault_weapon
5	• "Investigation Found Nearly 1.2 Million Ads on Armslist.com for Gun Sales Where No Background Check Was Required" • "two million people — two million — have been stopped from buying a gun at a federally licensed firearm dealer because they did not pass a background check"	Background Checks	check, background, law, sale, hand, criminal, state, firearm, federal, dealer
6	• "We wish we could say we lived in a country where our students could go to school and be safe from gun violence. But today, one of our country's college campuses has again become filled with violence and bloodshed." • "Following reports of a mass shooting at a Chesapeake, Virginia home in which five family members were killed by a shooter who then committed suicide"	School Shootings	school, shooting, kill, violence, child, incident, shoot, mass, sandy_hook, student

Note: The words in the "Words in Topic" column are the words most likely to be in that topic and least likely to be in others, determined by phi, which is the probability of each word or token to topics.

Identifying the Best Gun Rights LDA Model

Similar to the gun control press statements modeling building process, 2 to 20 topics models were built for the gun rights press statements. By graphing the coherence score in Figure 3, the model with six topics can be identified as the optimal model with diminishing returns.

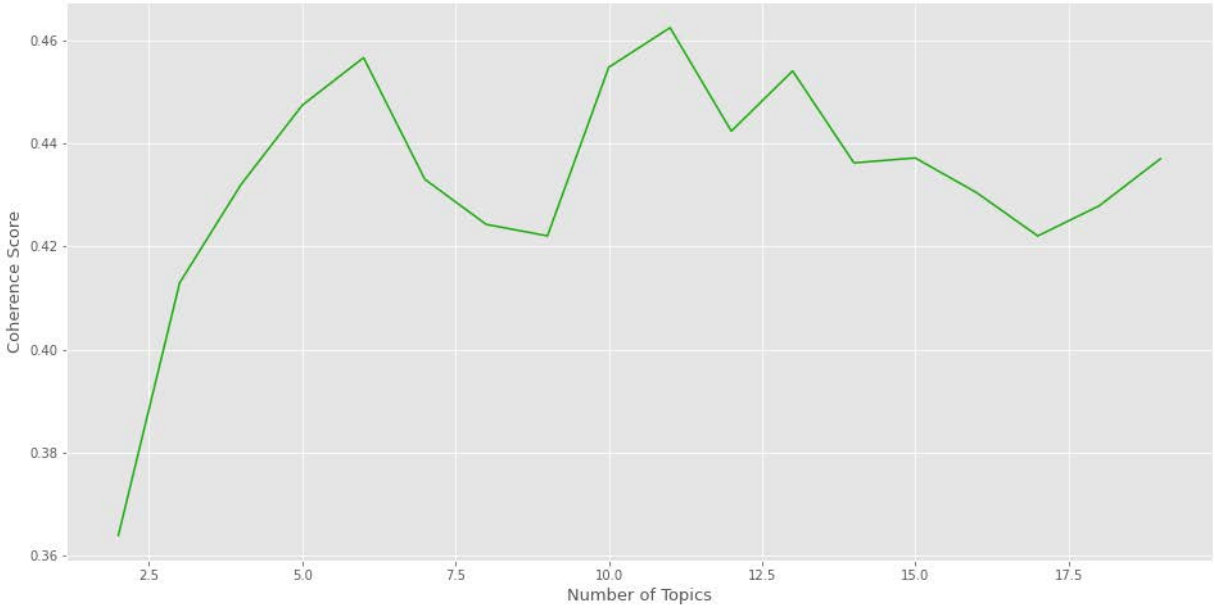


Figure 3: Coherence per Number of Topics in LDA Model for Gun Rights Organizations.

Gun Rights Press Statements' Topics

Similar to the gun control results, the best gun rights press statements LDA model results are shown in Table 2. Within this table, there is the topic number, some excerpts from each topic, the identified frame, and the ranked top words in the topic.

As seen in Table 2, the first topic for gun rights organizations is Elections. These are mainly made up of press statements directly promoting congresspeople aligned with the gun rights movement. The second topic, State Laws, focuses on state-level gun rights and rhetoric that alludes to the second amendment. But the word "state" is sometimes used to recognize the nation of the U.S. rather than a state within the U.S.

Table 2: Gun Rights Organization Press Statement Topics/Frames

Topic No.	Example Text	Frame	Words in Topic
1	• "the National Rifle Association Political Victory Fund (NRA-PVF) today endorsed Rick Tillis for re-election to the 92nd House district of Tennessee" • "'It's up to gun owners to vote for freedom on November 2nd,' continued Cox. 'The good people of Montana value their right to own firearms, and Gary MacLaren is just the man to represent them.'"	Elections	candidate, election, vote, mccain, support, campaign, voter, grpc, owner, member
2	• "A well regulated Militia, being necessary to the security of a free State, the right of the people to keep and bear Arms, shall not be infringed." • "The fact is, gun rights are in retreat. We submit quietly these days to regulations that would have horrified our parents' generation. Instead of gloating, we should be soul-searching, rethinking our basic assumptions about what constitutes a "reasonable" gun law."	State Laws	state, law, right, carry, firearm, citizen, amendment, lawsuit, city, second
3	• "That is not a legal term recognized in federal law as it relates to prohibitions against acquiring or possessing firearms." • "Suppressors are often mischaracterized. Unlike in the movies, they do not "silence" the sound of a firearm."	Firearms	gun, firearm, law, ban, crime, owner, criminal, control, year, use
4	• "What is clear is that, if Biden prevails, our rights protected by the Second Amendment will continue to come under ferocious attack." • "Gun Owners of America and Black Guns Matter are teaming up to teach grassroots organizing skills to enable gun owners to take to the streets to teach others about the importance of the Second Amendment."	Gun Rights	right, amendment, second, gun, say, court, case, foundation, people, keep
5	• "As Wednesday's attack demonstrated yet again, police are important, but they almost always arrive at the crime scene after the crime has occurred." • "While the media has begun to cover whether teachers can have guns at school or the almost 8,000 college students across the country who protested gun-free zones on their campuses, the media haven't started checking what are the rules where these attacks occur."	Shootings	gun, say, people, police, school, get, man, time, woman, go
6	• "S. 504 and H.R. 1078 are bills that would continue the dangerous trend towards erasing our foundational principles from America's schools" • "As much as they tried to put a brave face on their 240-190 final passage vote on H.R. 8, the truth is that — thanks to your activism — virtually every Republican opposed the bill."	Legislation	gun, bill, vote, owner, amendment, senator, antigun, hr, pass, legislation

Note: The words in the "Words in Topic" column are the words most likely to be in that topic and least likely to be in others, determined by phi, which is the probability of each word or token to topics.

This being said, the word “carry” appears in the State Laws topic, pointing to a significant number of instances of open carry and concealed carry being brought up in the topic. Both open carry and concealed carry are state-level legislative initiatives. The third topic, Firearms, centers around guns and gun control. For instance, this may include gun bans in certain places, gun control legislation, and gun accessories such as bump stocks or suppressors.

The fourth topic, Gun Rights, is similar to the State Laws topic but at a more general and federal level. Gun Rights is more general as the press statements make more vague claims and bring up the Second Amendment consistently as a federal tenet. The fifth topic, Shootings, is a mix of coverage of mass/school shooting and “good guy with a gun” shootings. Good-guy-with-a-gun is an important frame for both social movements, where a person is able to legally defend themselves from harmful assailants with a gun. The sixth topic, Legislation, focuses on the specific bills in congress and state-wide. There were instances where press statements were released targeting congresspeople that have voted against gun rights or have yet to vote on a gun rights bill. These press statements urged followers to email and call these representatives.

Facebook Post Data

As Goss (2020) mentions, the internet provided the infrastructure for both the Million Moms March and Moms Demand Action gun control organizations. Specifically, Goss mentions Facebook as a tool to build community and Twitter as a tool to contribute to “elite debates” (Goss 2020:144). If Facebook is a place where these organizations build a community, it also serves as an ideal place to gauge engagement.

I scraped 8,891 Facebook posts from the largest gun control organization, Everytown for Gun Safety (with 1.4 million followers), and 1,659 Facebook posts from the largest gun rights organization, National Rifle Association (with 4.8 million followers). Using a Python library

called “facebook-scraper,” I collected the post content, date, and engagement statistics (likes, reactions, shares, and comments) for the full extent of their Facebook pages. For Everytown for Gun Safety, the posts go back to the birth of the organization in December 2012. For the National Rifle Association, the posts only go back to March 2017.

The LDA topic models created for gun control and gun rights organizations were used to go through each Facebook post and infer the topic proportion of the post by using the variation of words in the post and topic model (Hoffman, Bach, and Blei 2010; Boussaadi, Aliane, and Abdeldjalil 2020, Nguyen and Ho 2021). The topic models can only infer the topic using the dictionary they were built upon, therefore if there were new topics described by new words this process would not pick up on those new topics. Similarly, if words are used in a dissimilar manner on the Facebook posts compared to the press statements, the topic inferences could be misleading. In the case of Everytown for Gun Safety and the National Rifle Association, the press statements and media articles are often forwarded through their Facebook pages, thus there is some expectation the topics found in the press statements should carry onto the Facebook posts.

Negativity bias has been shown to prevail within in-person settings, where negative feelings or content is spread more than positive feelings or content (Baumeister et al. 2001; Soroka 2012). The same phenomenon of emotional contagion is possible on Facebook (Coviello et al. 2014; Kramer, Guillory, and Hancock 2014). Considering the massive virality of some posts, researchers have looked into how negativity bias would impact user engagement. Most research supports the negativity bias, where negative posts garner more engagement (Auter and Fine 2016; Ceron and d’Adda 2016; Bebbington et al. 2017; Heiss, Schmuck, and Matthes 2019; de León and Trilling 2021). Although, there are other researchers that find a simplistic negativity

bias to be incorrect. Rather, other researchers find that positive content can also go viral depending on the context (Berger and Milkman 2012; Gerbaudo, Marogna, and Alzetta 2019).

Considering the importance of emotionality in user engagement, the Facebook posts' emotionality were gauged as well. This can be done through a python library called NRCLex which leverages the NRC Word-Emotion Association Lexicon (Mohammad and Turney 2010; Mohammad and Turney 2013). This lexicon has been utilized by various programming libraries to gauge the sentiment and emotion of text (Hipson and Mohammad 2021; Mohammad 2021; Vishnubhotla and Mohammad 2022). Sentiment can be determined to be positive or negative. Emotion can be determined to fall under one of Plutchik's eight fundamental emotions: anger, anticipation, disgust, fear, joy, sadness, surprise, or trust (Plutchik 2001; Plutchik 2014). In order to gauge sentiment and emotionality of each post, sentiment or emotion proportion is calculated using the following equation:

$$X\ sentiment\ or\ emotion\ proportion = \frac{\sum X\ sentimental\ or\ emotional\ words}{\sum total\ sentimental\ or\ emotional\ words}$$

All three engagement statistics (likes, comments, and shares) were log-formatted due to heavy positive skew of the distribution in order to satisfy the assumptions of OLS regression. Furthermore, each model controls whether the post included an image, an image with text on it, or a video. This information was gathered when posts were scraped from the Facebook pages of Everytown for Gun Safety and the National Rifle Association. As mentioned in the previous section, Plutchik's eight fundamental emotions (anger, anticipation, disgust, fear, joy, sadness, surprise, or trust) and general positive and negative sentiment of the post's text was included as controls. In order to determine the relationship between the post's topic and social media engagement, I constructed a series of OLS models with each topic with controls that predicted the log-formatted likes, shares, and comments. I avoided models in which all the topics predict

an engagement statistic since the topic prevalencies are zero-sum (i.e., combined, all topic prevalencies add to one for each post) and thus will cause multicollinearity issues. I present my results in the following section, first by examining the relationship of topics and their engagement for Everytown's posts before turning to the NRA's posts.

CHAPTER 4

OLS REGRESSION RESULTS

Gun Control Organization Social Media Engagement

Table 3 reports coefficients for the relationship of gun control frames in Everytown's Facebook posts to three social media engagement statistics (likes, comments and shares) using a series of independent OLS regression models. Since likes, comments, and shares are log-formatted (due to heavy positive skewness), the regression coefficient roughly can be interpreted as percent change in the outcome. For example, if a social media post is determined to have 100% prevalence of the Violence & Victims topic, the post is predicted to roughly perform 31% worse on likes compared to posts that did not use this frame at all.

Table 3: **Predicting Social Media engagement with Topics in Everytown (Gun Control) Posts**

	Likes	Comments	Shares
Concealed Carry	0.1055	0.1447	0.1706
	(0.214)	(0.235)	(0.236)
Violence & Victims	-0.3109***	-0.5288***	-0.2620*
	(0.094)	(0.103)	(0.103)
Elections & NRA	-0.1394	-0.0938	-0.3542**
	(0.096)	(0.106)	(0.106)
Firearms Industry	0.2053	0.7176***	0.4970***
	(0.108)	(0.118)	(0.119)
Background Checks	0.3355**	-0.0001	0.0006
	(0.121)	(0.133)	(0.133)
School Shootings	0.0599	0.0456	0.1850
	(0.090)	(0.099)	(0.100)

Note. Results calculated with 18 independent models predicting Facebook likes with each separate topic and a set of controls. Controls include whether the post includes a video, or an image, and the eight emotions and sentiments gathered from NRCLex. *p<.05; **p<.01; ***p<.001.

First, inspecting the topics' engagement from the Everytown posts, the Violence & Victims topic performed more poorly in likes, comments and shares compared to other posts.

More specifically, a pure Violence & Victims post does 31% worse on likes ($p<.001$), 53% worse on comments ($p<.001$), and 26% worse on shares ($p<.05$) compared to other posts centered on other topics. Furthermore, the Elections & NRA topic also was found to perform worse on shares compared to other topics. A pure Elections & NRA post does 35% worse on shares ($p<.01$). Both of these topics focused on the gun control movement from an abstract point of view. For instance, the Violence & Victims topic primarily were studies released on victimization rates and statements on various statistics as a result of gun violence. Studies have shown that adopting a sociological perspective on gun violence as a health issue does not resonate with the public (McKeever et al. 2022). Similarly, the Elections & NRA topic captured one of two things: (1) a record of legislation or election, or (2) a push to entice followers to push for a specific candidate or piece of legislation. The lack of shareability of the Elections & NRA posts reflect the lack of political participation in the gun control movement (Goss 2006, Merry 2015). This lack of shareability could be because of a lack of a victim in most of these posts, which tends to do well rhetorically (Goss 2020, Merry 2020). This lack of shareability could also be due to the lack of success for gun control initiatives and therefore followers avoid sharing these posts to avoid fatalism or being overly negative.

A pure Background Checks post roughly received 33% more likes than other posts ($p<.01$). More importantly, the Background Checks is the only topic that is seen to perform better on likes compared to the rest of the topics. The Firearms Industry topic performed better than other topics when it came to comments and shares. More specifically, a pure Firearms Industry post garnered 71% more comments ($p<.001$), and 50% more shares ($p<.001$) compared to other topic posts. To begin, the success of Background Checks when it comes to likes engagement might come from the fact that it identifies a specific problem and solution. In the case of

Background Checks, the topic often identifies the “gun-show loophole” as a major problem and promotes universal background checks as the solution. The same thing can be said about the success of the Firearms Industry topic, where the posts often talk about assault rifles and the recent failure of passing an assault rifle ban (Cicilline 2022). Therefore, the solutions mentioned in the Firearms Industry topic is to bring back the assault rifle ban and to allow victims of gun violence and specifically mass shootings to sue gun manufacturers who are protected from lawsuits (by the Protection of Lawful Commerce in Arms Act of 2005) (Morgan 1989, Burnett 2000, Moore 2018). It should also be noted that more shares play a different role compared to comments and likes, mainly due to the fact that it reaches the follower’s network, not just the individuals that follow the Everytown’s Facebook page. Likewise, the comments engagement statistic, such as for the Firearms Industry can be a result of more shares. For example, more followers might choose to share a post speaking on the Firearms Industry, but the comments may be from arguments under the post from the networks of those who chose to share it. Moreover, it is unclear what more or less comments entail as it could be statements that agree or debates on the post topic itself. Similarly, a user could be sharing a post in an attempt to disagree with the post, leaving shares ambiguous as well. Although the type of engagement that comments and shares are ambiguous in nature, the engagement itself may speak to (1) conflicts within supporters of a social movement, or (2) conflicts across supporters of different social movements, both of which are critical to the state of the social movement.

Gun Rights Organization Social Media Engagement

Table 4 reports results from a series of OLS regression models predicting social media engagement (likes comments, and shares) with frames used in NRA’s facebook posts, as calculated from the selected LDA model discussed above (see Table 2).

Table 4: Predicting Social Media engagement with Topics in NRA (Gun Rights) Posts

	Likes	Comments	Shares
Elections	-0.1458	-0.2521	-0.7823
	(0.418)	(0.411)	(0.517)
State Laws	1.0541***	0.4074	1.0649**
	(0.267)	(0.264)	(0.331)
Firearms	-0.5674**	-0.0569	-0.2540
	(0.191)	(0.188)	(0.237)
Gun Rights	0.3204*	0.7026***	0.8843***
	(0.137)	(0.134)	(0.168)
Shootings	-0.0055	-0.6796***	-0.5568***
	(0.121)	(0.118)	(0.149)
Legislations	-0.4773**	0.2225	-0.3829
	(0.180)	(0.177)	(0.223)

Note. Results calculated with 18 independent models predicting Facebook likes with each separate topic and a set of controls. Controls include whether the post includes a video, or an image, and the eight emotions and sentiments gathered from NRCLex. *p<.05; **p<.01; ***p<.001.

Moving over to the National Rifle Association's topics, the topics of Firearms and Legislation performed worse on likes compared to other topics. More specifically, a pure Firearms post received 56% less likes (p<.01) and a pure Legislations post received 48% less likes (p<.01) compared to other topic posts. Similarly, the Shooting topic performed worse in respect to comments and shares. A pure Shootings post amassed 68% less comments (p< .001) and 56% less comments (p<.001) compared to other topic posts. To begin, the topic of Firearms often interrogates the definitions of what is a firearm, what constitutes gun control, and refutations against gun control measures. Although these Firearms posts are often top performers, the average likes are weighed down by posts promoting sales of guns (link to example 1, example 2). The Legislation topic covers past and coming legislation and the pros and cons of such pieces of legislation. This topic encompasses both gun control measures and gun rights measures such as concealed carry or open carry (link to example 1, example 2).

Taking a look at a top performer in the Legislation posts, the post connects to push for legislation which most posts that take the Legislation frame fail to do (link to post). Finally, the Shooting topic often covers examples of "good guys with guns" rhetoric and counterarguments against those who push for gun control after a popularized shooting. These posts might receive less comments as users like the post and move on. But the lower amount of shares compared to other posts might indicate the supporters do not find the "good guys with guns" rhetoric appealing (link to example 1, example 2).

A pure State Laws topic was found to acquire over twice as many more likes ($p<.001$) and shares ($p<.01$) compared to other posts that did not incorporate this frame at all. Similarly, a pure Gun Rights post was found to garner 32% more likes ($p<.05$), 70% more comments ($p<.001$), and 88% more shares ($p<.001$). Both the State Laws and Gun Rights topics take the ethic of the second amendment to be fundamental. As mentioned in the description of the topics earlier, State Laws and Gun Rights overlap significantly with the exception of State Laws focusing on actual state-level legislation such as open carry or concealed carry. Most importantly, both of these topics take the second amendment to be the ground to defend and point to instances of attacks against the second amendment.

CHAPTER 5

DISCUSSION AND CONCLUSION

Discussion

This study contributes to the gun control movement in two major ways: (1) identifying predominant frames used in gun control and gun rights press statements, and (2) identifying their relationship to social media engagement.

LDA topic modelling was then applied to the press statements for gun control organizations and gun rights organizations, where six major topics for each corpus were found. For the gun control organizations' press statements, Concealed Carry, Violence & Victims, Elections & NRA, Firearms Industry, Background Checks, and School Shootings were found to be coherent frames. The Violence & Victims frame is an evolved frame from the "bad hands, bad guns" frame identified in the late 1960s (Goss 2006). The "bad hands, bad guns" frame equates to the crime-control frame where gun control activists aimed to get guns out of "gangsters" hands and aimed to get particular guns out of the streets (specifically assault rifles) (Goss 2006; Steidley & Colen 2017; Zoller and Casteel 2021). The Violence & Victim frame does not center on the "bad hands" rhetoric but rather focuses on the victims of such incidents to report state-wide or nation-wide. Steidley and Colen's (2017) work and Goss (2006, 2020) identify safety to be a primary frame. Although my study does not capture an explicit safety frame, this argument is often made with School Shooting, Firearms Industry, Background Checks, and Concealed Carry frames. Steidley and Colen's work also mentions a rights & democracy frame which can be seen in two of my frames. First, the right "from fear of guns and gun violence" can be seen in the fear that the Violence & Victims frame captures and the unwarranted killing of children in the School Shootings frame. The democratic right for citizens to choose their way of life is seen

in the Elections & NRA frame. Often the Elections & NRA frame speaks on how a specific politician refused money from the NRA which is identified by Zoller and Casteel (2021). The Concealed Carry, Firearms Industry (assault rifle ban), and Background Checks frames capture Goss' (2006, 2020) prediction that the gun control social movement would turn toward policy incrementalism at the state-level and Zoller and Casteel's (2021) legislation prognostic frame. The Firearms Industry frame perfectly corresponds with Zoller and Casteel's (2021) diagnostic frame of gun manufacturers.

For the gun rights organizations' press statements, Elections, State Laws, Firearms, Gun Rights, Shootings, and Legislation was found to be coherent frames. The State Laws and Gun Rights frames I identified are very similar to Steidley & Colen's (2017) frame of Second Amendment rights and freedoms and Goss' (2006) "jeopardy" frame. Goss mentions that this "jeopardy" frame follows the argument where gun control advocates are trampling on sacred American rights granted by the Second Amendment. The Shootings frame follows Steidley & Colen's of safety and rule of law or Goss' "perversity" frame, where the argument follows that guns are needed to keep people safe and any regulation on citizens obtaining guns will hurt law-abiding citizens and their families (Merry 2015; Steidley & Colen 2017; Merry 2020; Spitzer 2020).

I applied these identified frames to a dataset of Facebook posts from Everytown for Gun Safety and the National Rifle Association to identify their relationship to three key social media engagement statistics: likes, comments, and shares. For the Everytown's Facebook page, frames that were abstract such as Violence & Victims were found to underperform with likes, comments, and shares. This is likely due to the fact abstract posts such as these focused on diagnosing the problem in depth without any prescriptive claims. Using Benford and Snow's

(2000) typology of framing, this frame is a purely diagnostic frame. Moreover, even though victims are involved in this frame, the frame argues from a sociological perspective instead of an individualistic perspective which might be why the Violence & Victims frame performs poorly compared to other frames. Interestingly, the Elections & NRA frame was found to underperform in shares. Some of these posts urged followers to vote or support an initiative or candidate. This topic also included actions by the NRA and it's leadership which may be driving the engagement statistics. The Elections frame would best be classified as a prognostic frame. A clear indicator of a frame that will perform well is one that identifies a tangible issue and urges a specific solution (Goss 2006; Merry 2020). This is exactly what is found in the Background Checks and the Firearms Industry topics. These frames would best be classified as either a blend of diagnostic and prognostic frame or a blend of diagnostic, prognostic, and motivational frame. This is because most of the posts that fall under Background Checks and Firearms Industry identify the problem, point to a potential solution, and if possible, motivate the followers to on the next upcoming protest or piece of legislation that would directly affect the topic at hand.

For the National Rifle Associations' Facebook posts, the frames of Firearms and Legislation received fewer likes compared to posts that used other frames. For the Firearms frame, this topic may have suffered from the same issue that Violence & Victims did for Everytown, where the post diagnosed the problem at a depth uninteresting to followers. Therefore, the Firearms frame would be a diagnostic frame. Similarly, the Legislation frame may have done something similar or focused on past legislation which require no action on the part of followers. For the Legislation frame, if the post spoke about past legislation, it would be a diagnostic frame but if it spoke about a future piece of legislation it would be both diagnostic and prognostic framing. Finally, the Shootings frame also underperformed in comments and shares,

which may entail that followers are not as convinced by the arguments set forth in these posts, such as the "good guy with a gun" perspective. The Shooting frame would best be classified as a diagnostic and prognostic frame. The most successful frames are the State Laws and Gun Rights frames which take the second amendment to be the cornerstone of each post. The second amendment and gun rights are at the core of these posts. For instance, the most successful Guns Rights topic post, garnering more than 61,000 likes, shows a picture of Amy Coney Barrett and a message about how Justice Barrett's nomination approval by the Senate Judiciary Committee is one step closer to obtaining a Justice "who will respect our constitutional freedoms" (link to Facebook post). The most successful State Laws topic post, garnering more than 155,000 likes, is simply a picture with text that reads "25 states have enacted NRA Constitutional Carry, Screw government permission" (link to Facebook post). Much like the successful frames from Everytown's Facebook page, the State Laws and Gun Rights frames are best categorized as a blend of diagnostic and prognostic frame or a blend of diagnostic, prognostic, and motivational frame. The diagnostic and prognostic frames are highly weaved together in the gun rights movement in general, but especially in these two frames. These frames use the second amendment as the foundation and any characterized change from the second amendment and its conceptualized rights are the issue. In some of these frames, there are not clear actions to take but it is just statement from the NRA of where their values stand, but in a lot of the frames there is a specific initiative, piece of legislation, or candidate to oppose or support.

A very interesting comparison comes when noticing that Everytown's posts do well when targeting frames that identify a tangible issue and urge a specific solution. Whereas the most effective NRA frames take the second amendment as a foundation and talk about gun rights as an abstract American ethic that needs to be defended at all costs. Both organizations found frames

that focused on identifying specific problems at depth such as gun violence statistics or what gun control measures are doing to suffer compared to their other posts. Although not all frames that are diagnostic and prognostic succeeded, this seems to be a common template across both Everytown and the NRA for an engagement-rich frame.

Taking a deeper look, we can see that the Background Checks and the Firearms Industry (and the assault rifle ban) frames capture many points of Benford and Snow's (2000) requirements for frame saliency. First, the frames capture "centrality" or how well the beliefs or ideas line up with the group. Within these frames, the argument being formed is the lack of universal background checks, and assault rifles are causing people to kill others very easily. This frame will accomplish centrality since many of the gun control proponents become proponents due to mass shootings where assailants use assault rifles (Anon n.d.). Since gun control proponents see mass shooters with these assault-type weapons this serves the second point of "commensurability" for frame salience.

The same points of centrality and commensurability can be said about the State Laws and Gun Rights frames from the NRA Facebook posts. Most importantly, centrality is attained from the strong second amendment ethic that is portrayed in the two frames. Second, the narrative fidelity of the second amendment is very strong in the United States due to its historical significance.

Finally, counter-framing may have a hand at play for why some topics fair worse than others. For instance, the Shooting frame often corners the "good guy with a gun" narrative but often there is counter-framing from gun control advocates that point out instances where this is not the case (Hamel 2018, Stroud 2020, Mazur 2021). This counter-framing then diminishes the frames saliency through attacking it's commensurability. Likewise, the Violence & Victims

frame could suffer from something similar. For instance, 54% of gun deaths in 2020 were suicide which has been a common trend (Gramlich 2022). Similarly, more than three-fourths of individuals who engaged in mass shootings carried out the attack using a handgun, opposed to an assault rifle (Peterson 2021).

Conclusion

This study contributes to existing literature by using LDA topic modeling to identify major frames in press statements and discover how these frames performed on Facebook. Most significantly, within the gun control organizations' press statements there were six major frames: Concealed Carry, Violence & Victims, Elections & NRA, Firearms Industry, Background Checks, and School Shootings. For the gun rights organizations' press statements there were also six major frames found: Elections, State Laws, Firearms, Gun Rights, Shootings, and Legislation. When looking how the frames were constructed on Facebook, the best engagement was garnered from frames that blended a diagnostic, prognostic, and motivational message. In other words, the best performing frames were those that identified a problem, proposed a specific solution for the followers to act on, and gave some sense of urgency to act on the given solution.

This being said, there were also frames that accomplished a diagnostic and prognostic message but still underperformed compared to other frames. It might be the case that these frames perform well in a specific scenario that is not well captured by the OLS regression, or it could be the lack of the frame's saliency, or it could be successful counter-framing from the opposition that dissuades followers from full agreeing. Either way, more research must be done into capturing frame salience and counter-framing to better understand why some frames perform well and others with the same characteristics do not.

Moreover, framing is only a portion of how social movements operate and how they can

be successful. Future research should focus on resource mobilization, and the political process frameworks in addition to framing. First taking resource mobilization into consideration, although gun rights organizations outspend gun control organization on lobbying directly to policy makers, gun control organization outspent gun rights organizations in outside lobbying for the first time for the 2018 mid-term elections (Giorno 2022). Assessing how these organizations spend their resources and their effects should be taken into consideration. Secondly, taking the political process into account, future research should examine the effects of elite-level polarization. As the American public has been consistently and positively for various gun control policies since the 1970s (Erskine 1972, Smith 2002, Miller 2019) and as many scholars point to an elite-level polarization on gun control issues (Miller 2019, Rogowski and Tucker 2019), future research should examine how elite-level polarization impacts gun control success and the effect size compared to framing or resource mobilization.

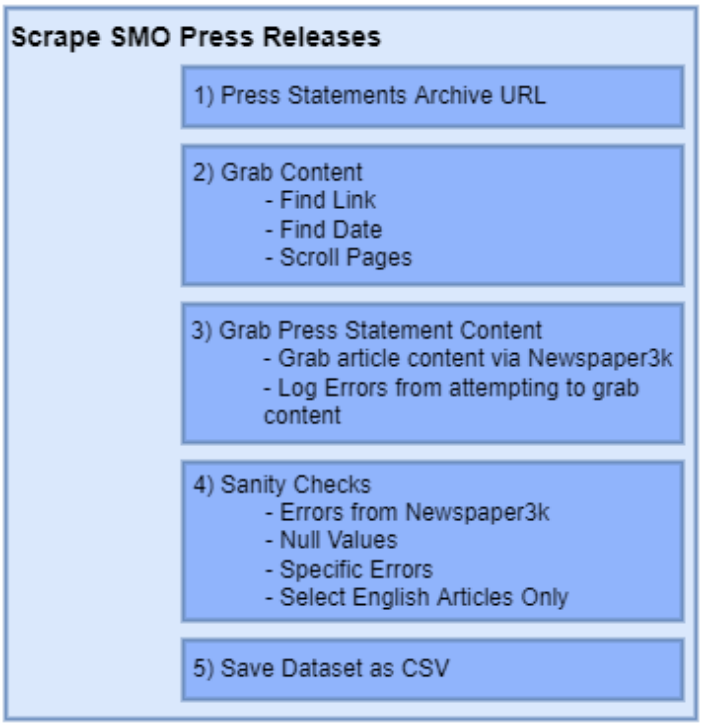
The reasoning behind why an individual chooses to become a gun control or gun rights advocate and become politically active is much more complex than frames seen from a social movement organization. Following Goss' (2006, 2020) suggestions, securing resource patrons and adopting a grass-roots approach is something the gun control movement still struggles with. Even then, effective framing allows social movement organizations to garner support from their followers and achieve their social movement's goals much more effectively (Merry 2015, Merry 2020). Often when change is occurring, poignant rhetoric is seen hand-in-hand with mass movements and legislative initiatives. Similarly, for both gun control and gun rights social movements, effective framing around background checks, assault rifle bans, and the second amendment and the subsequent rights bestowed onto citizens have resonated with individual in their respective movements.

APPENDIX A

THE BLUE PATH: SMO PRESS STATEMENTS

Scraping SMO Press Statements

Each of the nine organizations have their own website and a location on their website where some of the press statements are archived. Notably, not all organizations have a press statements archive dating back to their creation. For instance, the NRA has an archive that dates to the 1990s, but the Brady Campaign's press statements only go back 2012. Using the Python programming language (along with web scraping libraries such as beautifulsoup, selenium, and newspaper3k) a web scraping bot will be created to scrape each of the eleven organization's press statements archive:



For each of the eleven web scraping bots, the starting point will be a publicly available press statements archive from the SMO's website. Starting from the press statements archive URL, there two subsequent steps to attaining the press statements and its content: (1) scrolling through and grabbing the link and dates (Step 2 in above figure), and (2) processing the links to grab the content of a particular press statement page (Step 3 in above figure).

To begin, there are variations of how each SMO presents their press statement archive. Many of the archives have an archive where the press statements title and date are listed on a page, and where you have to click on “Next Page” or some variation of this to access the next page of the press statements archive. There are a few outliers from this format. For instance, the Violence Policy Center has a dated CSS-based archive where links are just HREF linked text and the dates are appended to the end of the title text. In another instance, Giffords has a more modern webpage where the next page’s content is dynamically loaded when a user scrolls to the bottom of the page.

In the scenario where the SMO has a “Next Page” option, the web scraping bot will use the python library selenium to create a user-simulated bot and beautifulsoup to parse the HTML from the webpage. The bot will grab all of the press statement objects seen on the page. For example, if there are 12 press statements on page 1 then the bot will recognize all of those objects and iterate through them. In each iteration, the bot will grab the designated HTML objects of the link and the date. These objects are identified by going into Chrome’s inspect feature and manually specifying the HTML object of the link and date. Once the press statements on the first page is processed, there will be a process by which the web scraper goes to the next page. There are two methods by which this can occur. In the first case, the next web page has a distinct URL (such as www.SMO.com/press-statements-page-2). In this scenario, the bot will be able to pick up this URL from the pagination bar at the bottom of the screen and call a new webpage. In the second case, the website might be a “dynamic web application” powered by JavaScript or Angular. In this scenario, the second page of the archive might not have a distinct URL due to the fact that the loading of the second page occurs on the client side of the

application. With a dynamic web application, the web scraping bot must be programmed to identify the “Next Page” button and click it.

In the scenario where there is only one page with the title and date in a listed format (such is the case with the Violence Policy Center), the bot can grab the link and date in one iterative loop. Granted the link, title, and date are in separate HTML entities, the bot can grab the link and date of the press statements without further programming into a dataset. In the scenario where there is a dynamic webpage that loads content as needed (without a pagination bar), the web scraping bot will need to be programmed to scroll to the bottom of the page. In the case of Giffords, the user needs to scroll to the bottom of the web page and click “Load More” to gather the next set of press statements. Thus, a user can scroll down and click “Load More” repeatedly to see all of the press statements on the same page. In such scenario, the bot will be programmed to do this continuously until the bot reached the end of the press statements archive (where the button is not interactable due to the website hiding it). After all of the press statements are on the page, all of the press statements objects will be identified and processed iteratively similar to the other scenarios above.

It is important to point out a potential failure point here. Any object that might emulate a press statement object might be interpreted as a press statement object and added to the data. This is to say if there is an error on the website or a human error of adding a non-press statement to the press statement archive, the current process would include such entries. Similarly, if there is a press statement object that has a slightly different structure or is misplaced on the webpage for one reason or other, this process would miss such entries in the data collection process. Some of these errors result in an explicit error when programming the web scraper and can be investigated, when no error occurs this would be an unseen source of error.

The next step to grabbing the press statement content is to go to each of the press statement URLs and grab the press statement content itself. Using the python library, Newspaper3k, the URL will be called and the text pertaining to the press statements content will be processed. In one example, there may be a lot of added content such as sidebars with social media information or advertisements within the main content bar. The Newspaper3k library allows the bot to parse just the text information from the press statements by grabbing paragraph, title, and subtitle HTML objects (such as <h1>, <p>).

Using the Newspaper3k makes grabbing the press statement content much easier, but this comes with many potential failure points. The first, most obvious failure point is if Newspaper3k is not able to access the webpage itself. This is likely due to the webpage not allowing bots to be on the page. In such scenarios, the bot will have to be configured in such a way to include proxies or grab the press statement content in a more manual way.

The second failure point is if Newspaper3k able to access the web page but cannot access the content for any reason. In this case, there will be an explicit error which can be recorded as “error in fetching article” in place of the press release content. This can be managed in different methods in post-processing sanity checks.

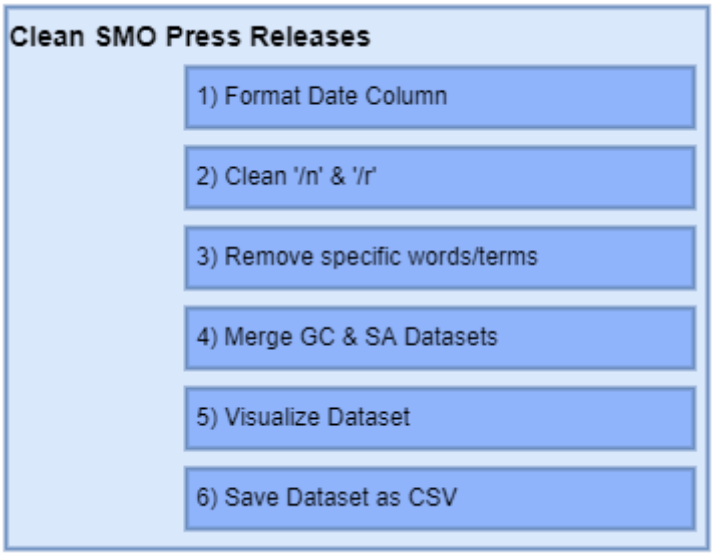
The final failure point is if Newspaper3k is able to access the web page and is able to grab the content but there is some error in grabbing the content. In this scenario, the library will not throw an explicit error and instead place the erroneous press statement data in the press statement column. These errors could include completely blank values, the wrong content (such as grabbing blog post teaser text) and grabbing the press statement content but also extra content that should not be included with the press statement content. Like the second failure point, these can be confronted partially in the post-processing sanity checks.

With the steps detailed above, the bot has scraped a dataset of the date, link, and content of each press statement from a specific SMO. Due to the potential failure points discussed, there will be a few sanity checks (Step 4 in above figure). First, there is a check if there are any press statements with “error in fetching article” from newspaper3k. The corresponding links can be checked manually to see the source of this error. If this is an error due to lack of content, a blank press statement, or a video, these press statement rows can be dropped. If there is a valid press statement, the content can be manually entered into the dataset. Second, there will be a check if there are any null values for press statement content. The same validation check of manually accessing the corresponding link and either dropping or supplementing the press statement content can be done. Third, there will be a check for specific errors that could occur. One example is a “404 – Content Not Found” page coming up. These rows can be dropped due to a lack of a press statement. Another example is repeated content. Repeated content in multiple press statements is likely an error from newspaper3k grabbing the wrong content such as a blog teaser or some other content on the webpage. These rows can be respectively dropped or supplemented. The final sanity check is to use a python library called Langdetect to determine the language of the press statement and select the English press statements only.

Once all of the individual bots are complete and have scraped their respective SMO websites, the gun control and gun rights organizations will be compiled into their respective datasets. Within these datasets will be rows indicating one press statement with corresponding columns containing the date, link, and press statement content. The gun control and gun rights press statements will then be saved with their SMO name, and their scraped / saved date (example of scraping the Brady Campaign on February 3rd, 2022: “Brady_2-3-22.csv”). Once these files are created, these files will be read into a dataframe in subsequent processes such as

cleaning or building models but will never be saved into. If a newer scrape needs to be performed, a new file with the updated date can be added and used in further processes. This practice will be in place for validating previous analysis and for safe keeping of each step of data processing.

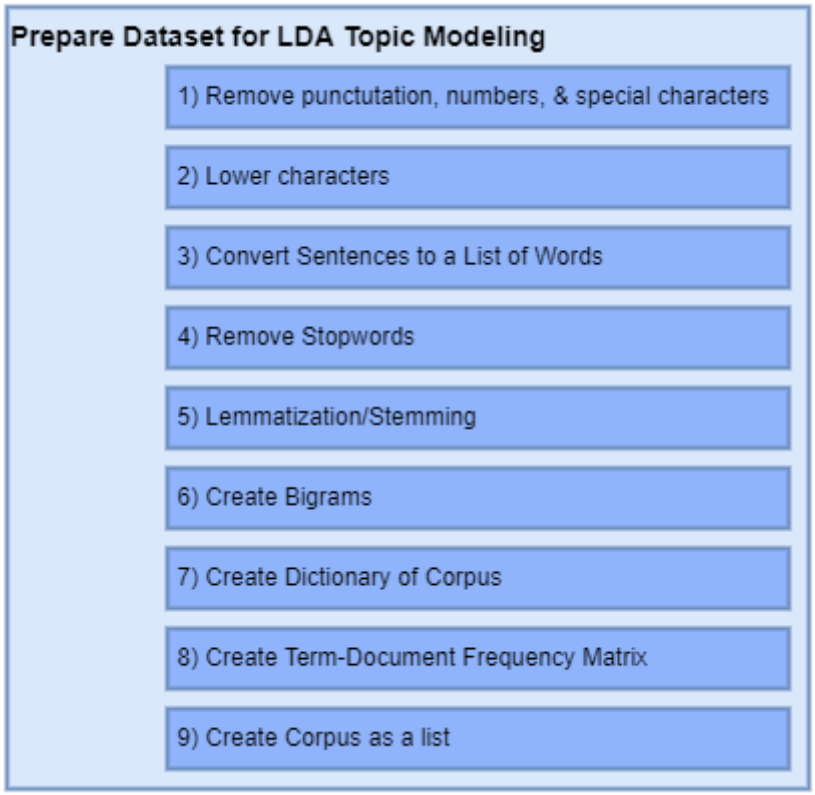
Cleaning SMO Press Statements



With the resulting 9 CSV files containing the raw press statements a standard cleaning procedure for natural language processing will occur. First, the dates from each organization's press statements will be parsed into a datetime object. Second, raw characters that are an artifact of web design (such as raw code indicating a newline '\n') will be removed from the press statement content. Third, there will be a search and remove any errors in the text that might have occurred (such as null/NaN values, specific website errors, and false or repeated content). This third step is a continuous process that might be added to in later stages, but some due diligence is required in the first pass. Fourth, the 6 gun control organization's and the 3 gun rights organization's press statements will be merged into a "GC_PS" (gun control press statements)

and “GR_PS” (gun rights press statements) dataframes respectively. Fifth, the sum of each SMO’s press statements per month will be performed and graphed in order to understand the frequency of a SMO’s press statements over time. Finally, the GC_PS and GR_PS dataframes will be saved into their respective CSV files.

Preparation and Construction of the LDA Topic Model



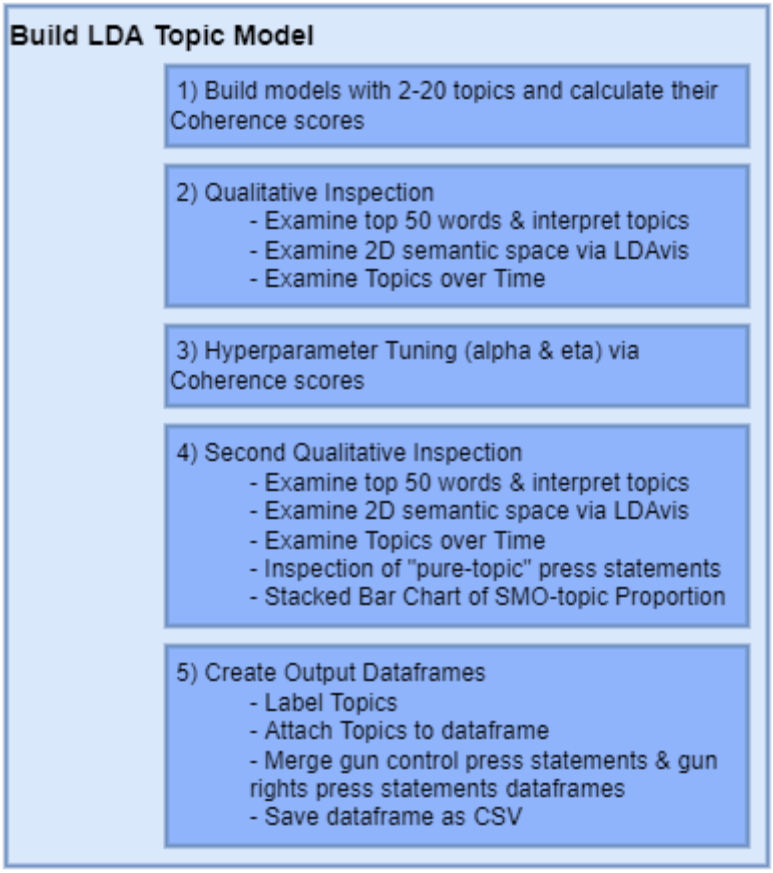
The next step after cleaning the press statements is to prep the dataset for LDA modeling, as shown in the figure above. The first step will consist of removing unwanted characters such as punctuation, numbers and special characters, as these characters will not provide any help for the LDA model. Second, all characters will be lowered, so there are no duplicates for the same words starting with an upper case and lower-case letter. Third, each of the press statements will

be converted into a list of words for further language processing. Fourth, stop words (highly frequent words that do not add value to the corpus such as “the” and “so”) will be removed.

Fifth, each of the words in the corpus will be lemmatized/stemmed. Here, both find the canonical representation of each word. For instance, “walking” would be reduced to “walk” in both the stemming and lemmatization process. But lemmatization is slightly more sophisticated as it would reduce the word “better” into the word “good.” The objective of doing either of these processes is to shorten the number of words in the dictionary in order to get more coherent topics. One pitfall here might be the specific verbiage used might be erased. The most ideal method in choosing which process to use is to not choose at all. Rather, the ideal process would include three different procedures at this juncture: (1) no lemmatization or stemming, (2) stemming, and (3) lemmatization. Doing this and proceeding to the qualitative investigation of the topic models would allow the differences between the processes to be more carefully understood.

Sixth, bigram phrases of the list of words will be created. For instance, in this corpus the phrase “second amendment” would be important. But since “second amendment” is a phrase with two different words, the topic model would not pick up on this difference. Thus, using a bigram (or trigram) phraser would turn the term “second amendment” into “second_amendment,” allowing the model to take that phrase into consideration. Seventh, a dictionary of unique words across the corpus will be created. Eighth, a term-document frequency matrix will be constructed. The term-document frequency matrix is an entity that shows which words from the dictionary are used in which documents how many times. The term-document frequency matrix will serve as one of the essential inputs into the LDA topic model. Ninth, the

list of words of each document will be made into a list of documents themselves and will serves as an input for the LDA model.



With the press statements prepped for the LDA model, the next step is to build and validate the models. The first step is to build a variety of models from 2 to 20 topics and find their respective coherence score. In order to determine how many topics are within the corpus, a metric called “coherence” in addition to qualitative inspection will be used. This coherence metric measures the degree of semantic similarity of the words found in a topic (Röder, Both, and Hinneburg 2015). Moreover, the coherence metric (opposed to other measures such as log-likelihood, cosine distance, or perplexity) has been found to maximize the interpretability of topics (Scarborough and Crabbe 2021). Next, the models with relatively high coherence scores

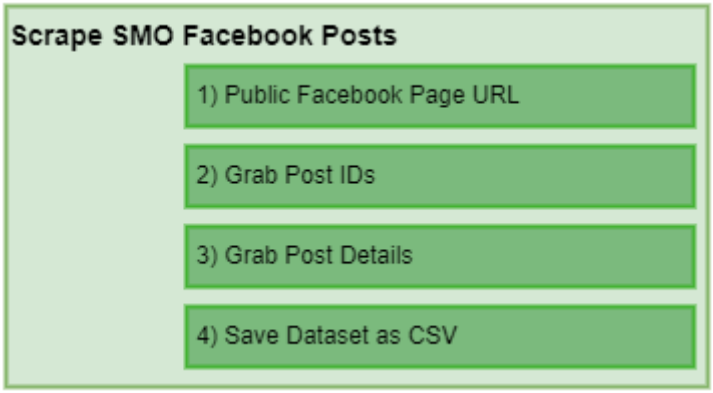
will be selected and a qualitative inspection will be performed for each selected model. This qualitative inspection includes (1) labeling the topics by inspecting the words and their weights, (2) graphing the semantic space using LDAvis (Sievert and Shirley 2014), and (3) inspect specific press statements with high topic proportions. Once the optimal number of topics are found, a similar procedure will be run to find the optimal hyperparameters for the LDA model. These hyperparameters are “alpha” and “eta.” Alpha is a value from 0 to 1 which controls the document-topic distribution. Eta is a value from 0 to 1 which controls the topic-word distribution. The second qualitative inspection will add the inspection of “pure-topic” press statements to better understand the topics, as well as a stacked bar chart to understand the distribution of topics per SMO. Finally, the result will be a labeled press statement dataset with topic proportions and the LDA model itself.

With a dataset of press statements, their publication date, their frames, and the originating organization a descriptive frame analysis can be performed. This descriptive frame analysis can uncover questions such as which organizations emphasize which frames, when organizations emphasize particular frames, the gun control movement’s frame proportion as a whole and the changes in frame proportion over time.

APPENDIX B

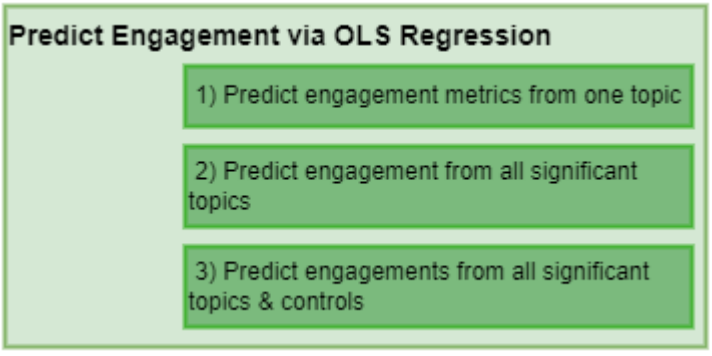
THE GREEN PATH: FACEBOOK POSTS

Scraping Facebook (or any of Meta's companies) has been notoriously difficult due to their effort to keep their data to themselves for either the privacy concerns for their users or their own monetization scheme. Thus, even when using the "facebook-scraper" library, the process is not straight forward due to being temporarily banned by Facebook themselves. As detailed in the figure below, there are four main steps to creating a web scraper for the public Facebook pages for the specified SMOs. First, the URL for SMO's public Facebook page will be set as the starting point. Then, when initializing the facebook-scraper library, an actual user's credentials will be fed into the scraper in order for the scraper to sign in as the user. Second, the scraper will go through the entire SMO Facebook page and gather all of the post IDs. Then in the third step, the scraper will go through all of the post IDs and grab all of the associated content. These two steps are vital as Facebook will temporarily ban scrapers that scrape too long. Thus, grabbing the post IDs first will allow us to resume progress when temporarily banned. Then in the final step, the Facebook post data will be saved to a CSV file.



These Facebook posts will then go through a similar cleaning process as the press statements did. Finally, the LDA topic model that was build earlier will be used to infer topics found in each post. Therefore, a dataset that consists of the posts with topic or frame proportions and its corresponding engagements statistics will be the final result.

For the last step, a standard OLS regression will be used to predict engagement of various frames. The OLS regression can also control for a variety of factors such as if the post was a video or picture, and date. As detailed in the figure below, multiple regression models will be created due to the multicollinearity problem with the topic proportions (since the topic proportions all add up to 1). In the first step, one engagement statistic (such as likes) will be predicted from one topic at a time. Identifying the significant topics, in the second step the same engagement statistic will be predicted by all of the significant topics. Finally, in the third step controls are added in alongside the significant topics to predict the engagement statistic. This process will be repeated for all of the engagement statistics (likes, reactions, number of comments and number of shares). Since this regression model will then be able to discover which frames predict more or less likes/reactions, comments, and shares. Predicting more likes or reactions can entail large agreement with the post's frames. Predicting more comments may indicate the post's frames to be controversial. Predicting more shares can entail large agreement with the post's frame, similar to likes but to a greater degree as the user wants to share the post with their following.



REFERENCES

Aizenman, Nurith. 2018. “Deaths From Gun Violence: How The U.S. Compares With The Rest Of The World.” NPR, November 9.

Alpers, Philip, Michael Picard, and Irene Pavesi. 2022. “Guns in the United States: Total Number of Gun Deaths.” GunPolicy.Org.

Anon. 2022a. “America’s Gun Culture - in Seven Charts.” BBC News, April 22.

Anon. 2022b. “Public Mass Shootings: Database Amasses Details of a Half Century of U.S. Mass Shootings with Firearms, Generating Psychosocial Histories.” National Institute of Justice. Retrieved March 8, 2023 (https://nij.ojp.gov/topics/articles/public-mass-shootings-database-amasses-details-half-century-us-mass-shootings).

Anon. n.d. “Prohibit Assault Weapons.” Retrieved March 20, 2023 (https://www.everytown.org/solutions/assault-weapon-ban/).

Auter, Zachary J., and Jeffrey A. Fine. 2016. “Negative Campaigning in the Social Media Age: Attack Advertising on Facebook.” Political Behavior 38(4):999–1020. doi: 10.1007/s11109-016-9346-8.

Baumeister, Roy F., Ellen Bratslavsky, Catrin Finkenauer, and Kathleen D. Vohs. 2001. “Bad Is Stronger than Good.” Review of General Psychology 5(4):323–70. doi: 10.1037/1089-2680.5.4.323.

Bebbington, Keely, Colin MacLeod, T. Mark Ellison, and Nicolas Fay. 2017. “The Sky Is Falling: Evidence of a Negativity Bias in the Social Transmission of Information.” Evolution and Human Behavior 38(1):92–101. doi: 10.1016/j.evolhumbehav.2016.07.004.

Benford, Robert D., and David A. Snow. 2000. “Framing Processes and Social Movements: An Overview and Assessment.” Annual Review of Sociology 26(1):611–39.

Berger, Jonah, and Katherine L. Milkman. 2012. “What Makes Online Content Viral?” Journal of Marketing Research 49(2):192–205. doi: 10.1509/jmr.10.0353.

Berkowitz, Bonnie, and Chris Alcantara. 2021. “More than 50 Years of U.S. Mass Shootings: The Victims, Sites, Killers and Weapons.” Washington Post, May 12.

Berthelot, Emily, Troy Blanchard, and Timothy Brown. 2008. “Scots-Irish Women and the Southern Culture of Violence: The Influence of Scots-Irish Females on High Rates of Southern Violence.” Journal of Rural Social Sciences 23(2).

Birkland, Thomas, and Regina Lawrence. 2009. “Media Framing and Policy Change After Columbine.” Thomas A Birkland 52. doi: 10.1177/0002764209332555.

Blei, David M., Andrew Y. Ng, and Michael I. Jordan. 2003. “Latent Dirichlet Allocation.” J. Mach. Learn. Res. 3(null):993–1022.

Boussaadi, Smail, Dr Hassina Aliane, and Pr Ouahabi Abdeldjalil. 2020. “Modeling of Scientists Profiles Based on LDA.”

Burnett, H. Sterling. 2000. “Suing Gun Manufacturers: Hazardous to Our Health.” Texas Review of Law & Politics 5:433.

Carlson, Jennifer. 2015. Citizen-Protectors: The Everyday Politics of Guns in an Age of Decline. Oxford University Press.

Carlson, Jennifer. 2020. “Policing the Second Amendment: Guns, Law Enforcement, and the Politics of Race.” in Policing the Second Amendment. Princeton University Press.

Ceron, Andrea, and Giovanna d’Adda. 2016. “E-Campaigning on Twitter: The Effectiveness of Distributive Promises and Negative Campaign in the 2013 Italian Election.” New Media & Society 18(9):1935–55. doi: 10.1177/1461444815571915.

Chuck, Elizabeth, Alex Johnson, and Corky Siemaszko. 2018. “‘Pure Evil’: 17 Killed in Mass Shooting at Florida High School.” NBC News. Retrieved May 1, 2022 (https://www.nbcnews.com/news/us-news/police-respond-shooting-parkland-florida-high-school-n848101).

Cicilline, David N. 2022. H.R.1808 - 117th Congress (2021-2022): Assault Weapons Ban of 2022.

Cook, Philip J., and Kristin A. Goss. 2020. The Gun Debate: What Everyone Needs to Know. Oxford University Press, USA.

Coviello, Lorenzo, Yunkyu Sohn, Adam D. I. Kramer, Cameron Marlow, Massimo Franceschetti, Nicholas A. Christakis, and James H. Fowler. 2014. “Detecting Emotional Contagion in Massive Social Networks.” PLOS ONE 9(3):e90315. doi: 10.1371/journal.pone.0090315.

DeFoster, Ruth, and Natashia Swalve. 2018. “Guns, Culture or Mental Health? Framing Mass Shootings as a Public Health Crisis.” Health Communication 33(10):1211–22. doi: 10.1080/10410236.2017.1350907.

Dehler-Holland, Joris, Kira Schumacher, and Wolf Fichtner. 2021. “Topic Modeling Uncovers Shifts in Media Framing of the German Renewable Energy Act.” Patterns 2(1):100169. doi: 10.1016/j.patter.2020.100169.

Deliso, Meredith. 2021. “What Other Countries Show Us about America’s Gun Violence Epidemic.” ABC News. Retrieved April 30, 2022 (https://abcnews.go.com/US/countries-show-us-americas-gun-violence-epidemic/story?id=80495637).

DiMaggio, Paul, Manish Nag, and David Blei. 2013. “Exploiting Affinities between Topic Modeling and the Sociological Perspective on Culture: Application to Newspaper Coverage of U.S. Government Arts Funding.” Poetics 41(6):570–606. doi: https://doi.org/10.1016/j.poetic.2013.08.004.

Doherty, Carroll, Jocelyn Kiley, Baxter Oliphant, Andrew Daniller, Bradley Jones, Hannah Hartig, Amina Dunn, Ted Van Green, and Vianney Gomez. 2021. “Amid a Series of Mass Shootings in the U.S., Gun Policy Remains Deeply Divisive.” Pew Research Center. Retrieved April 22, 2022 (https://www.pewresearch.org/politics/2021/04/20/amid-a-series-of-mass-shootings-in-the-u-s-gun-policy-remains-deeply-divisive/).

Erskine, Hazel. 1972. “The Polls: Gun Control.” The Public Opinion Quarterly 36(3):455–69.

Fabian, Jordan, and Rebecca Savransky. 2018. “Trump Supports Efforts to Improve Gun Background Checks.” The Hill, February 19.

Fleming, Anthony K., Paul E. Rutledge, Gregory C. Dixon, and J. Salvador Peralta. 2016. “When the Smoke Clears: Focusing Events, Issue Definition, Strategic Framing, and the Politics of Gun Control.” Social Science Quarterly 97(5):1144–56.

Fleming, Anthony, Dylan S. McLean, and Raymond Tatalovich. 2018. “Debating Gun Control in Canada and the United States: Divergent Policy Frames and Political Cultures.” World Affairs 181(4):348–71. doi: 10.1177/0043820018812609.

Frosch, Dan, and Kirk Johnson. 2012. “12 Are Killed at Showing of Batman Movie in Colorado - The New York Times.” The New York Times, July 20.

Gerbaudo, Paolo, Federico Marogna, and Chiara Alzetta. 2019. “When ‘Positive Posting’ Attracts Voters: User Engagement and Emotions in the 2017 UK Election Campaign on Facebook.” Social Media + Society 5(4):2056305119881695. doi: 10.1177/2056305119881695.

Giorno, Taylor. 2022. “Gun Rights Groups Set New Lobbying Spending Record in 2021.” OpenSecrets News. Retrieved April 19, 2023 (https://www.opensecrets.org/news/2022/05/gun-rights-groups-set-new-lobbying-spending-record-in-2021/).

Goffman, Erving. 1974. Frame Analysis: An Essay on the Organization of Experience. New York: Harper Colophon: Harvard University Press.

Goss, Kristin A. 2006. Disarmed. Princeton University Press.

Goss, Kristin A. 2015. “Defying the Odds on Gun Regulation: The Passage of Bipartisan Mental Health Laws across the States.” American Journal of Orthopsychiatry 85(3):203.

Goss, Kristin A. 2020. “Whatever Happened to the ‘Missing Movement’?” Pp. 136–50 in Gun studies: Interdisciplinary Approaches to Politics, Policy, and Practice. Routledge.

Gramlich, John. 2022. “What the Data Says about Gun Deaths in the U.S.” Pew Research Center. Retrieved April 30, 2022 (https://www.pewresearch.org/fact-tank/2022/02/03/what-the-data-says-about-gun-deaths-in-the-u-s/).

Gray, Sarah. 2019. “Here’s a Timeline of the Major Gun Control Laws in America.” Time, April 30.

Grinshteyn, Erin, and David Hemenway. 2016. “Violent Death Rates: The US Compared with Other High-Income OECD Countries, 2010.” The American Journal of Medicine 129(3):266–73. doi: 10.1016/j.amjmed.2015.10.025.

Grosjean, Pauline. 2014. “A History of Violence: The Culture of Honor and Homicide in the Us South.” Journal of the European Economic Association 12(5):1285–1316. doi: 10.1111/jeea.12096.

Gutowski, Stephen. 2019. “NRA Membership Dues, Contributions Rebounded In 2018.” Washington Free Beacon, May 30.

Hamel, Matthew. 2018. “Good Guys and Good Reasons: Addressing the Constitutionality of Good Reason Right-to-Carry Regulations and the Failures of the" Good Guy with a Gun" Theory.” New Eng. L. Rev. 53:55.

Heiss, Raffael, Desiree Schmuck, and Jörg Matthes. 2019. “What Drives Interaction in Political Actors’ Facebook Posts? Profile and Content Predictors of User Engagement and Political Actors’ Reactions.” Information, Communication & Society 22(10):1497–1513. doi: 10.1080/1369118X.2018.1445273.

Hipson, Will E., and Saif M. Mohammad. 2021. “Emotion Dynamics in Movie Dialogues.” PLOS ONE 16(9):e0256153. doi: 10.1371/journal.pone.0256153.

Hoffman, Matthew, Francis Bach, and David Blei. 2010. “Online Learning for Latent Dirichlet Allocation.” in Advances in Neural Information Processing Systems. Vol. 23. Curran Associates, Inc.

Holcombe, Madeline. 2021. “At Least 20 Mass Shootings Have Taken Place in the Two Weeks since the Metro Atlanta Spa Attacks Left 8 Dead.” CNN, April 1.

Jacobs, James B. 2002. Can Gun Control Work? Oxford University Press.

Jones, Jeffery M. 2010. “Americans Still Perceive Crime as on the Rise.” Gallup Politics.

Kalesan, Bindu, Matthew E. Mobily, Olivia Keiser, Jeffrey A. Fagan, and Sandro Galea. 2016. “Firearm Legislation and Firearm Mortality in the USA: A Cross-Sectional, State-Level Study.” The Lancet 387(10030):1847–55. doi: 10.1016/S0140-6736(15)01026-0.

Kantack, Benjamin R., and Collin E. Paschall. 2020. “Does ‘Politicizing’ Gun Violence Increase Support for Gun Control? Experimental Evidence from the Las Vegas Shooting.” Social Science Quarterly 101(2):893–908. doi: 10.1111/ssqu.12754.

Kramer, Adam D. I., Jamie E. Guillory, and Jeffrey T. Hancock. 2014. “Experimental Evidence of Massive-Scale Emotional Contagion through Social Networks.” Proceedings of the National Academy of Sciences 111(24):8788–90. doi: 10.1073/pnas.1320040111.

Laschever, Eulalie, and David S. Meyer. 2021. “GROWTH AND DECLINE OF OPPOSING MOVEMENTS: GUN CONTROL AND GUN RIGHTS, 1945–2015*.” Mobilization: An International Quarterly 26(1):1–20. doi: 10.17813/1086-671X-26-1-1.

de León, Ernesto, and Damian Trilling. 2021. “A Sadness Bias in Political News Sharing? The Role of Discrete Emotions in the Engagement and Dissemination of Political News on Facebook.” Social Media + Society 7(4):20563051211059710. doi: 10.1177/20563051211059710.

Levenson, Eric. 2018. “These Are the Victims of the Florida School Shooting.” CNN, February 21.

Mazur, Karol. 2021. “The "GOOD GUY WITH A GUN” CONCEPT IN THE AMERICAN GUN CULTURE AND GUN CONTROL POLICY.” Scientific Journal of Bielsko-Biala School of Finance and Law 25(2):5–10. doi: 10.19192/wsfip.sj2.2021.1.

McCarthy, John D., and Mayer N. Zald. 1977. “Resource Mobilization and Social Movements: A Partial Theory.” American Journal of Sociology 82(6):1212–41.

McGinty, Emma E., Julia A. Wolfson, Tara Kirk Sell, and Daniel W. Webster. 2016. “Common Sense or Gun Control? Political Communication and News Media Framing of Firearm Sale Background Checks After Newtown.” Journal of Health Politics, Policy and Law 41(1):3–40. doi: 10.1215/03616878-3445592.

McKeever, Brooke W., Minhee Choi, Denetra Walker, and Robert McKeever. 2022. “Gun Violence as a Public Health Issue: Media Advocacy, Framing and Implications for Communication.” Newspaper Research Journal 43(2):138–54. doi: 10.1177/07395329221090497.

McMillan, Jordan, and Mary Bernstein. 2022. “Beyond Gun Control: Mapping Gun Violence Prevention Logics.” Sociological Perspectives 65(1):177–95. doi: 10.1177/07311214211010845.

Merry, Melissa. 2016. “Making Friends and Enemies on Social Media: The Case of Gun Policy Organizations.” Online Information Review 40(5):624–42. doi: 10.1108/OIR-10-2015-0333.

Merry, Melissa K. 2015. “Constructing Policy Narratives in 140 Characters or Less: The Case of Gun Policy Organizations.” Policy Studies Journal 44(4):373–95. doi: 10.1111/psj.12142.

Merry, Melissa K. 2018. “Narrative Strategies in the Gun Policy Debate: Exploring Proximity and Social Construction.” Policy Studies Journal 46(4):747–70. doi: 10.1111/psj.12255.

Merry, Melissa K. 2019. “Angels versus Devils: The Portrayal of Characters in the Gun Policy Debate.” Policy Studies Journal 47(4):882–904. doi: 10.1111/psj.12207.

Merry, Melissa Kate. 2020. Warped Narratives: Distortion in the Framing of Gun Policy. University of Michigan Press.

Miller, Steven V. 2019. “What Americans Think About Gun Control: Evidence from the General Social Survey, 1972–2016.” Social Science Quarterly 100(1):272–88. doi: 10.1111/ssqu.12555.

Mohammad, Saif M. 2021. “Sentiment Analysis: Automatically Detecting Valence, Emotions, and Other Affectual States from Text.”

Mohammad, Saif M., and Peter D. Turney. 2013. “Crowdsourcing a Word–Emotion Association Lexicon.” Computational Intelligence 29(3):436–65. doi: 10.1111/j.1467-8640.2012.00460.x.

Mohammad, Saif, and Peter Turney. 2010. “Emotions Evoked by Common Words and Phrases: Using Mechanical Turk to Create an Emotion Lexicon.” Pp. 26–34 in Proceedings of the NAACL HLT 2010 Workshop on Computational Approaches to Analysis and Generation of Emotion in Text. Los Angeles, CA: Association for Computational Linguistics.

Mohr, John W., and Petko Bogdanov. 2013. “Introduction—Topic Models: What They Are and Why They Matter.” Poetics 41(6):545–69. doi: 10.1016/j.poetic.2013.10.001.

Moore, Ernest E. 2018. “Another Mass Shooting: Time to Ban the Assault Rifle.” Journal of Trauma and Acute Care Surgery 84(6):1036. doi: 10.1097/TA.0000000000001863.

Morgan, Eric C. 1989. “Assault Rifle Legislation: Unwise and Unconstitutional.” American Journal of Criminal Law 17:143.

Newman, Benjamin J., and Todd K. Hartman. 2019. “Mass Shootings and Public Support for Gun Control.” British Journal of Political Science 49(4):1527–53. doi: 10.1017/S0007123417000333.

Nguyen, Van-Ho, and Thanh Ho. 2021. “Analyzing Customer Experience in Hotel Services Using Topic Modeling.” Journal of Information Processing Systems 17(3):586–98. doi: 10.3745/JIPS.04.0217.

Patterson, Kelly D., Matthew M. Singer, Allan J. Cigler, and Burdett A. Loomis. 2007. “Targeting Success: The Enduring Power of the NRA.” Interest Group Politics 37–64.

Peterson, Jillian. 2021. “A Multi-Level, Multi-Method Investigation of the Psycho-Social Life Histories of Mass Shooters.”

Plutchik, Robert. 2001. “The Nature of Emotions: Human Emotions Have Deep Evolutionary Roots, a Fact That May Explain Their Complexity and Provide Tools for Clinical Practice.” American Scientist 89(4):344–50.

Plutchik, Robert. 2014. “Emotions: A General Psychoevolutionary Theory.” in Approaches To Emotion. Psychology Press.

Preidt, Robert. 2016. “How U.S. Gun Deaths Compare to Other Countries.” Retrieved April 30, 2022 (https://www.cbsnews.com/news/how-u-s-gun-deaths-compare-to-other-countries/).

Quinn, Genevieve. 2022. “Evolution and Electoral Implications of Congressional Gun Control Issue Framing: ‘From Crime Control to Mass Shootings.’” Journal of Policy History 34(3):440–72. doi: 10.1017/S0898030622000124.

Röder, Michael, Andreas Both, and Alexander Hinneburg. 2015. “Exploring the Space of Topic Coherence Measures.” Pp. 399–408 in Proceedings of the eighth ACM international conference on Web search and data mining.

Rogowski, Jon C., and Patrick D. Tucker. 2019. “Critical Events and Attitude Change: Support for Gun Control After Mass Shootings.” Political Science Research and Methods 7(4):903–11. doi: 10.1017/psrm.2018.21.

Scarborough, William J., and Rowena Crabbe. 2021. “Place Brands across US Cities and Growth in Local High-Technology Sectors.” Journal of Business Research 130:70–85.

Schaeffer, Katherine. 2019. “Share of Americans Who Favor Stricter Gun Laws Has Increased since 2017.” Pew Research Center. Retrieved April 22, 2022 (https://www.pewresearch.org/fact-tank/2019/10/16/share-of-americans-who-favor-stricter-gun-laws-has-increased-since-2017/).

Schaeffer, Katherine. 2021. “Key Facts about Americans and Guns.” Pew Research Center. Retrieved April 22, 2022 (https://www.pewresearch.org/fact-tank/2021/09/13/key-facts-about-americans-and-guns/).

Schumer, Charles E. 1994. H.R. 4296 - 103rd Congress (1993-1994): Public Safety and Recreational Firearms Use Protection Act.

Shahid, Sharon, and Megan Duzor. 2021. “VOA Special Report | History of Mass Shooters.” Voice of America News, June 1.

Siegel, Michael, Molly Pahn, Ziming Xuan, Craig S. Ross, Sandro Galea, Bindu Kalesan, Eric Fleegler, and Kristin A. Goss. 2017. “Firearm-Related Laws in All 50 US States, 1991–2016.” American Journal of Public Health 107(7):1122–29. doi: 10.2105/AJPH.2017.303701.

Sievert, Carson, and Kenneth Shirley. 2014. “LDAvis: A Method for Visualizing and Interpreting Topics.” Pp. 63–70 in Proceedings of the Workshop on Interactive Language Learning, Visualization, and Interfaces. Baltimore, Maryland, USA: Association for Computational Linguistics.

Smith, Jackie, and Robert D. Benford. 1992. “Master Frames and Cycles of Protest.” Frontiers in Social Movement Theory 133–55.

Smith, Tom W. 2002. “Public Opinion about Gun Policies.” The Future of Children 12(2):155–63. doi: 10.2307/1602745.

Smith, Tom William, Faith Laken, and Jaesok Son. 2014. Gun Ownership in the United States: Measurement Issues and Trends. NORC at the University of Chicago Chicago, IL.

Snow, David A., E. Burke Rochford Jr, Steven K. Worden, and Robert D. Benford. 1986. “Frame Alignment Processes, Micromobilization, and Movement Participation.” American Sociological Review 464–81.

Soroka, Stuart N. 2012. “The Gatekeeping Function: Distributions of Information in Media and the Real World.” The Journal of Politics 74(2):514–28. doi: 10.1017/S002238161100171X.

Spitzer, Robert J. 2020. The Politics of Gun Control. Routledge.

Steidley, Trent, and Cynthia G. Colen. 2017. “Framing the Gun Control Debate: Press Releases and Framing Strategies of the National Rifle Association and the Brady Campaign.” Social Science Quarterly 98(2):608–27.

Stelmach, Greg, and Hilary Boudet. 2021. “Using Structural Topic Modeling to Explore the Role of Framing in Shaping the Debate on Liquefied Natural Gas Terminals in Oregon.” American Behavioral Scientist 00027642211056268. doi: 10.1177/00027642211056268.

Stroud, Angela. 2020. “Guns Don’t Kill People…: Good Guys and the Legitimization of Gun Violence.” Humanities and Social Sciences Communications 7(1):1–7. doi: 10.1057/s41599-020-00673-x.

The Global Burden of Disease 2016 Injury Collaborators. 2018. “Global Mortality From Firearms, 1990-2016.” JAMA 320(8):792–814. doi: 10.1001/jama.2018.10060.

Thompson, Mike. 2019. Bipartisan Background Checks Act of 2019.

Victor, Daniel, and Derrick Bryson Taylor. 2021. “A Partial List of Mass Shootings in the United States in 2021.” The New York Times, December 1.

Vishnubhotla, Krishnapriya, and Saif M. Mohammad. 2022. “Tweet Emotion Dynamics: Emotion Word Usage in Tweets from US and Canada.”

Vogel, Steve, Sari Horwitz, and David A. Fahrenthold. 2012. “Sandy Hook Elementary Shooting Leaves 28 Dead, Law Enforcement Sources Say.” Washington Post, December 14.

Walter, Dror, and Yotam Ophir. 2021. “Strategy Framing in News Coverage and Electoral Success: An Analysis of Topic Model Networks Approach.” Political Communication 38(6):707–30.

Wozniak, Kevin H. 2017. “Public Opinion About Gun Control Post–Sandy Hook.” Criminal Justice Policy Review 28(3):255–78. doi: 10.1177/0887403415577192.

Zakocs, R. C., J. A. Earp, and C. W. Runyan. 2001. “State Gun Control Advocacy Tactics and Resources.” American Journal of Preventive Medicine 20(4):251–57. doi: 10.1016/s0749-3797(01)00301-4.

Zhang, Maggie Mengqing, Xiao Wang, and Yang Hu. 2021. “Strategic Framing Matters But Varies: A Structural Topic Modeling Approach to Analyzing China’s Foreign Propaganda About the 2019 Hong Kong Protests on Twitter.” Social Science Computer Review 08944393211042575. doi: 10.1177/08944393211042575.

Zoller, Heather M., and Diana Casteel. 2021. “#March for Our Lives: Health Activism, Diagnostic Framing, Gun Control, and the Gun Industry.” Health Communication 1–11.