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Can we identify any religious or racial bias? Examining the 'Mass shooting in the USA' using media discourse: Frequency Distribution and Sentiment Analysis.

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Abstract: Discourse involves expressing opinions using language and communication tools, reflecting social customs and standards. It helps interpret situations based on language and purpose. Discourse reflects symbolic interactions at the intersection of action and enunciation fields. Media discourses influence attitudes, beliefs, and social representations. Young audiences tend to favor media content related to their gender (Draganescu, 2019). This paper will explore media responses to religious and racial factors after a mass shooting.

Keywords:
mass shooting, copycat effect, theory of cultivation, law enforcement, gun violence archive.

Introduction:

Over the past few decades, academic experts in media studies have been increasingly aware of a rise in tension and conflict between followers of various religions and multiple forms of communication. Despite whichever particular faith is being showcased, religious clichés are becoming more widespread across all platforms. Sadly, this has made many communities feel threatened by modern-day advances that they see as potential threats to their established practices upheld through generations. Moreover, news sources themselves sometimes reinforce these overused stereotypes when covering any one of three primary Abrahamic beliefs: Judaism; Christianity or Islam. In addition to not having adequate representation for such substantial population groups within Canada like Jewish one's Muslims face significant invisibility issues either entirely disregarded from media representations negatively portrayed solely based on limiting viewpoints held about them which adds up additional problems rendering equality difficult if not impossible. All things considered we need closer examination into how each demographics' associated belief system exhibited via different channels especially regarding "Christianity", "Judaism" & "Islam". Analyzing nuanced portrayals can give us insight into deeper-rooted apprehension harbored amidst religion societies towards several networks transmitting messages without fear transgressing set boundaries threatening cultural norms people hold dearly irrespective whether realize it consciously or remain unaware altogether (MediaSmarts, 2012).According to the cultivation theory, an individual's perception of the world can be gradually formed and their behavior influenced through repeated exposure to media. With regard to crime media and its depiction of race, this theory asserts that negative portrayals of certain racial groups in such media could affect a person's inclination to become a U.S. police officer. Recent research shows people from non-white ethnic

backgrounds are often depicted as criminals in various forms by the mass-market press which may contribute towards undesirable attitudes directed at these communities (Mastro et al., 2019). This portrayal is also impacting how law enforcement agencies are viewed along with individuals' pursuit for careers within it. Furthermore, Mastro et al.'s study (2019) highlights increased endorsement among those who watch criminal television programmes regarding uncompromising policing tactics paired with strict justice policies.. Additionally Weaver & Zillmann,(2000) discovered prolonged viewing has led viewers believing there was more wrongdoing than exists creating calls demanding bolstered numbers on patrol duty. Consequently, fuelling further interest into taking up roles as part officialdom. The main idea shared amongst all researchers suggests continued depictions surrounding ethnicity relating crimes, tends affecting not only opinions but career choices related getting involved directly or indirectly associated challenging notions featured repeatedly over time said themes typically being highly biased.

Role of media in Copycat effect:

The "copycat effect" is a theory that looks at violent offenses being repeated in the future. It's related to another study called "mass shooting contagion," according to Schildkraut (2014). Due to the growing rate of mass shootings in America, it has become commonplace for one occurrence every 12.5 days, a frequency that is alarmingly high. Speculation into possible contagion effects has risen recently - this theory suggests that after an initial tragedy like a shooting occurs, another incident will be more likely to happen soon afterwards as if spreading through imitation or inspiration. Although contagious behavior can illustrate how certain actions are replicated over time between individuals; it cannot explain exactly how replication happens from person-to-person within close proximity. This distinction leads many experts nowadays pointing towards generalized copying affecting an individual's tendency toward imitative action and replicate what they see around them instead. Most often than not when new shooters perform such acts inspired by previous ones rather than duplicating these events themselves first-hand. Research indicates media coverage about shootings might influence people´s behavior even without watching the event live. People usually come across selective information delivered via various sources which could inspire copycat tendencies. In some instances, this comprehensive content includes details on shooter’s personal life including their manifesto, and background knowledge about incidents, cascading upon viewership with increased chances of inspiring mimicry (Meindl & Ivy ,2017).

Related works:

Learning Word Vectors for Sentiment Analysis:

This paper introduces a sentiment analysis model that incorporates word vectors that capture both semantic and sentiment similarities among words. The authors contend that current models do not

sufficiently account for sentiment information and propose a supervised sentiment component that employs the vector representation of words to make sentiment predictions. To evaluate the model, the researchers conducted document-level and sentence-level classification tasks using the Pang and Lee sentiment and subjectivity corpora, as well as a sizable dataset of informal movie reviews from the Internet Movie Database (IMDB). The paper emphasizes the significance of integrating sentiment information into word vector models for effective affective analysis (Maas et al., 2011).

Ternary Twitter Sentiment Classification with Distant Supervision and Sentiment-Specific Word Embeddings:

The authors of the paper published in 2016, Byrkjeland et al., introduce a fresh approach to ternary Twitter sentiment classification. Their method incorporates sentiment-specific word embeddings and distant supervision, aiming to enhance classification performance when dealing with noisy and sparse Twitter data. The proposed method involves training sentiment-specific word embeddings, which are then utilized as features in a deep learning model for classification. By evaluating their method on various benchmark datasets, the authors demonstrate that their approach surpasses existing ones.

A Comprehensive Analysis of Preprocessing for Word Representation Learning in Affective Tasks:

Babanejad et al. (2020) performed a thorough examination of the impact of preprocessing techniques on affective analysis using word vector models. Their study underscores the crucial role of preprocessing in all natural language processing prediction models and downstream tasks, particularly in the realm of affective systems. The authors offer valuable perspectives on the relevance of each preprocessing technique when implemented during either the training or downstream task phase. This pioneering study concentrates on preprocessing techniques in word vector-based models applied to affective systems.

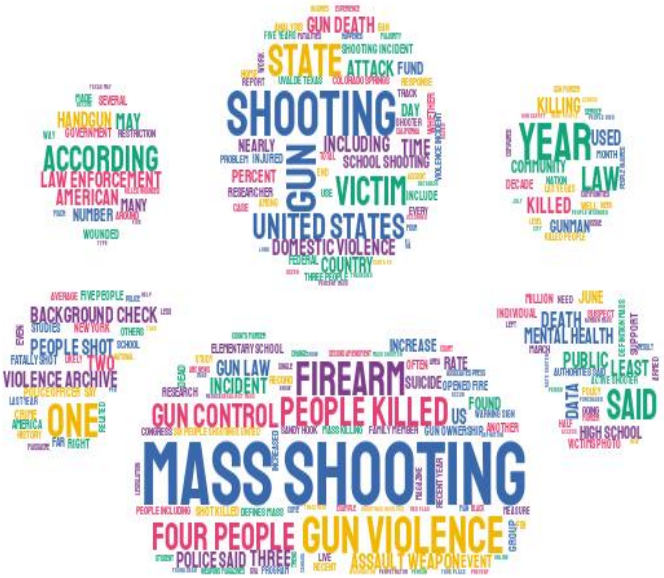
About the corpus:

In order to, address our research question, we have gathered a total of 30 corpora. The majority of these, specifically 21, were sourced from reputable news outlets. The remaining 9 were obtained from well-established organizations.

Name of these news medias are: “The Mercury News”, “The USA Today”, “The New York Times”, “Vox”, “CNN”, “NBC”, “ABC News”, “The Washington Post”, “The Nation”, “Smithsonian Magazine”, “CBC News”, “United Press International”, “Voice of America”, “The Hill”, “AP News”.

Name of these organizations are: “U.S. Department of Justice”, “disaster philanthropy”, “Everytown research”, “Health affairs”, “Science”, “National Library of Medicine”, “Council on Foreign Relations”, “Pew Research Centre”, “The Marshall Project”.

The length of the corpus is 47326 including punctuation, digits, symbols and the length of corpus without punctuation and digits, symbols is 38845.



1 Style Cloud

6. Methodology:

After collecting 30 corpora in a text file, we combined all of them in a single text file, named it 'Bigdata' and applied some NLTK tools.

nltk.word_tokenize(): To split a sentence into words, we use a method called word_tokenize(). This o utput can be turned into a Data Frame to better understand text in machine learning. Additionally, it ca n be used for further text cleaning steps such as removing punctuation, numbers, or stemming. Since m achine learning models require numeric data, word tokenization is important for converting text to num eric data (www.guru99.com, n.d.).

nltk.Text(): "A wrapper around a sequence of simple (string) tokens, which is intended to support initi al exploration of texts (via the interactive console). Its methods perform a variety of analyses on the tex t's contexts (e.g., counting, concordance, collocation discovery), and display the results. If you wish to write a program which makes use of these analyses, then you should bypass the **Text** class, and use the appropriate analysis function or class directly instead" (tedboy.github.io, n.d.).

nltk.corpus.stopwords: Stop words are common and frequent words in text that don't provide insights into the topic of a document. Removing these stop words can clean up data and reveal more relevant w ords. Examples of stop words include 'the', 'is', and 'are'. They can be filtered from text during processi ng. The nltk module has a list of stop words, but there is no universal list in nlp research (pythonspot, n .d.).

nltk.bigrams(): English words often appear together in texts, so identifying these pairs (called bigram) can aid in sentiment analysis. To create bigrams, the NLTK library's Python function can be used (ww w.guru99.com, n.d.).

nltk.FreqDist(): Frequency distributions are a useful tool for tracking the occurrence of word types in a document. Essentially, a frequency distribution is a function that maps each sample to the number of t imes that sample appears as an outcome. To create a frequency distribution, one typically runs a numbe r of experiments and tallies up the count for each sample whenever it appears as an outcome of a word (tedboy.github.io, n.d.).

We began by breaking down the Bigdata into individual words or tokens, and organized them using nltk.Text(). This allowed us to easily apply various nltk tools as needed. To ensure accurate analysis, we removed all punctuation from the tokens using a for loop and converted them to lowercase. Additionally, we eliminated stop words as they hold limited significance in meaning. Using nltk.bigrams(), we identified the most commonly used phrases and then used nltk.FreqDist() to count their occurrences. Our goal was to pinpoint the top 100 phrases that are most commonly used in media discourse.

After that, we tried weighing out number of positive and negative words existing in a whole corpus (excluding digits, stop words) with the help of MPQA lexicon. Then we applied Textblob and Vader sentiment analyser to find out sentiment of this media corpus and to also find out few important facts like subjectivity, polarity.

MPQA lexicon: A lexicon comprises words with assigned sentiment values, commonly used as a pre-established dictionary of words. Each word has various synonyms that help to associate it with specific emotions or attitudes. MPQA lexicon has been used here.

Textblob: A Python NLP library, utilizes NLTK for categorization, classification, sentiment analysis and more.

VADER: VADER (Valence Aware Dictionary and sEntiment Reasoner) is a lexicon and rule-based sentiment analysis tool for social media and works well on texts from other domains (cjhutto, 2018).

Findings:

Findings with Frequency distribution:

We analyzed media discourse on US mass shootings and focused on significant bigram phrase frequency distribution. Expected phrases surfaced, but one unexpected phrase emerged, and some anticipated phrases were absent from the corpus.

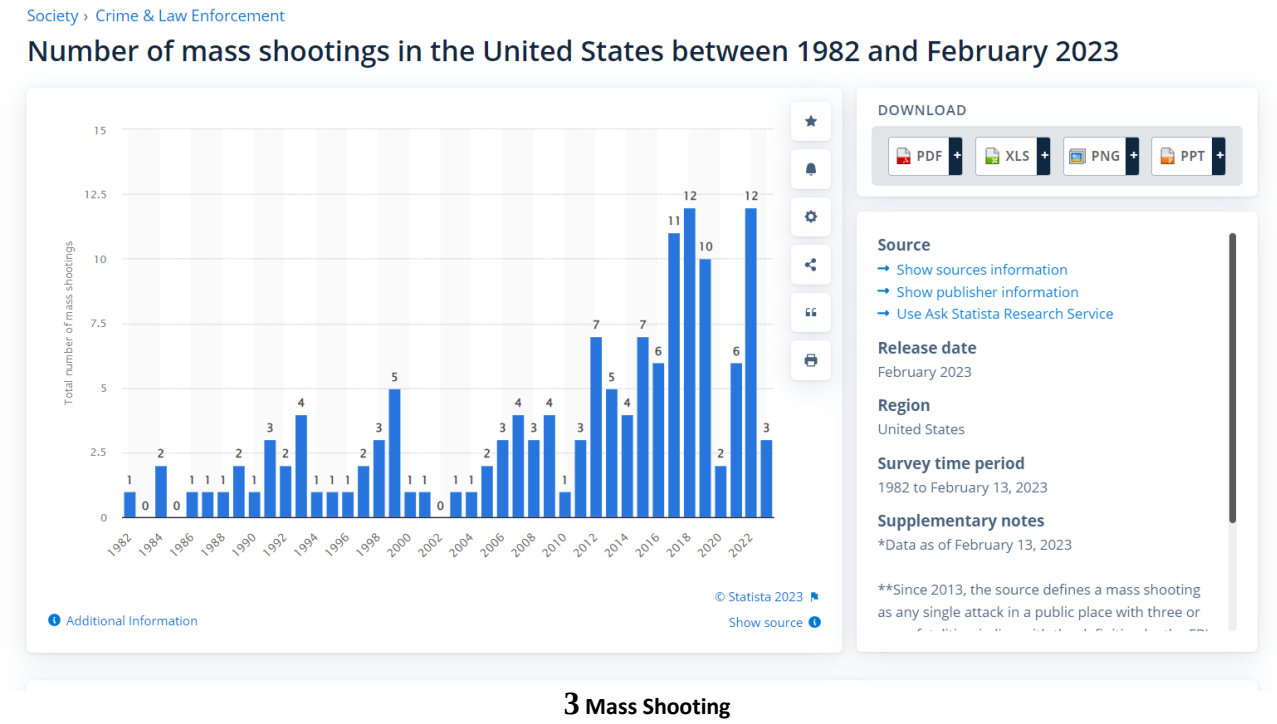
```
bigram_fd = nltk.FreqDist(nltk.bigrams(stop_word_removed))
bigram_fd.most_common(100)
```

```
[(('mass', 'shootings'), 307),
 (('mass', 'shooting'), 156),
 (('gun', 'violence'), 122),
 (('people', 'killed'), 66),
 (('four', 'people'), 58),
 (('united', 'states'), 51),
 (('gun', 'control'), 47),
 (('gun', 'laws'), 41),
 (('people', 'shot'), 39),
 (('domestic', 'violence'), 36),
 (('law', 'enforcement'), 35),
 (('violence', 'archive'), 34),
 (('mental', 'health'), 33),
 (('police', 'said'), 32),
 (('assault', 'weapons'), 32),
 (('gun', 'deaths'), 31),
 (('high', 'school'), 28),
 (('elementary', 'school'), 26),
 (('opened', 'fire'), 25),
 (('shot', 'killed'), 25),
 (('background', 'checks'), 25),
 (('school', 'shooting'), 24),
 (('new', 'york'), 22),
 (('fatally', 'shot'), 22),
 (('five', 'people'), 21),
 (('background', 'check'), 21),
 (('gun', 'ownership'), 21),
 (('victims', 'photo'), 20),
 (('authorities', 'said'), 20),
 (('colorado', 'springs'), 20),
 (('people', 'including'), 19),
 (('uvalde', 'texas'), 18),
```

Figure 2 Frequency Distribution

Mass shooting/ Mass shootings/ Gun deaths/ Gun violence in USA (616):

As we analyze media behavior towards specific races or religions, the occurrence of mass shootings has been a critical factor that appeared in our corpus 616 times. A violent crime committed by an assailant who uses firearms to harm multiple individuals at once is known as a mass shooting. The criteria for defining what constitutes such crimes varies from person to person, with some requiring at least three or four victims within minutes while excluding the perpetrator. Consensus hasn't been reached on exact parameters regarding them; however, it's significant to note definitions may exclude certain types of violence like gang-related incidents and domestic homicides rather than being limited only to warfare exclusion (Wikipedia Contributors,2019). Concerningly since 1982, the loss of countless loved ones through random public location-based massacres remains unresolved issues without apparent motives behind these heinous acts continuing today despite efforts combating gun control measures aimed toward prevention strategies needed.



3 Mass Shooting

source: https://www.statista.com/statistics/811487/number-of-mass-shootings-in-the-us/

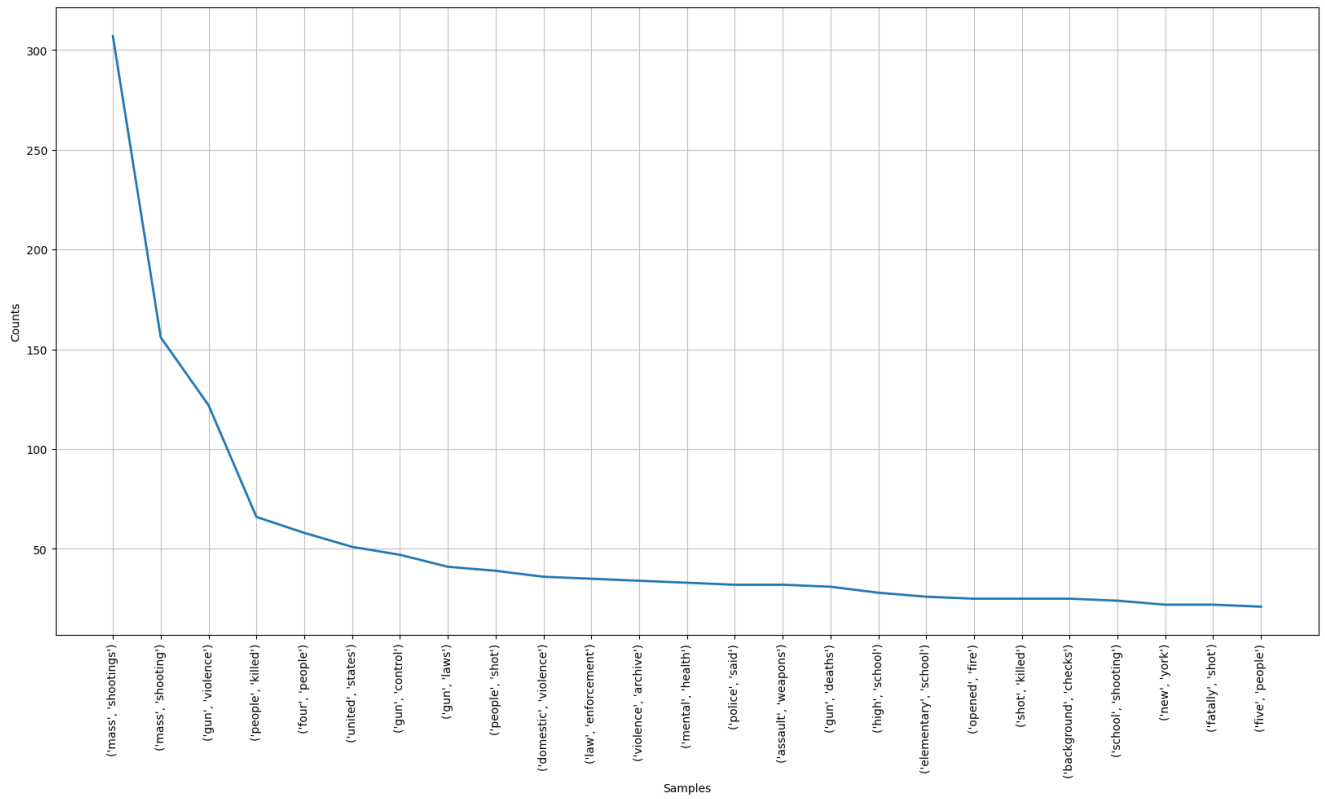
Gun Control/ Gun Laws/ Law enforcement (123 times):

Following terms such as ‘mass shooting’, ‘mass shootings’, ‘gun violence’, the most anticipated words that surface are phrases like "47 counts of gun control," “41 incidents with legislation,” along with "35 protocols for enforcement." While these three utterances may vary in their composition, they rouse similar impressions -the necessity of rules regulating firearms production, sale, posession and usage by groups or individuals around different territories. As per estimations made it would appear that there exists a total of 393 million guns within American borders—120.5 weapons per individual—with this number marking it to be both the highest count globally and also on par when observed from its population ratio standpoint. The ownership rate stands at twenty-two percent throughout America (thirty-five percentage among men while twelve percentages amongst women) due to colonial history alongside frontier expansion factors which offer ample insight into how things have reached here; all aided further via Second Amendment regulations wherein norms included state: "A free nation requires healthy citizen activity mediated through regulated militia whose right cannot get trespassed upon because people possess arms." Those looking ahead towards implementing new gun control measures suggest stricter implementation policies addressing aspects including reduced violent tendencies perceived across varied circumstances over time alongside greater acceptance levels; thus garnering sympathy even from firearm supporters themselves who advocate said restrictions. On the other hand those advocating for universal possession rights argue otherwise stating how every person regardless

should posses weaponry since threats could arise ranging anywhere between local criminal activities up till international invasions-though recent studies seem encouraging albeit inconclusive- proving effective crime deterrence caused by increased vigilance regarding weapon acquisition patterns (PronCon.org.,2020). Over the years, gun control laws have been enacted to restrict the right of individuals to keep and bear firearms. Despite these efforts, however, it is widely recognized that such measures are ineffective in preventing crime involving guns. Lawbreakers simply disregard them as they break other laws too; hence, there seems no point imposing new ones if we can't enforce existing legislation either. In recent decades violent crimes have reduced by over 50% while more people carry firearms outside their homes than ever before which has contributed significantly in reducing criminal activity rates overall. A study showed criminals fear armed citizens far more compared to law enforcement authorities alone which could be guiding factor behind this decrease. Curiously cities like New York and Chicago with some of the most stringent firearm regulations on record seem resistant towards implementing systematic changes leading amongst high violence toward its citizenry during any given year at an alarming rate despite evidence indicating otherwise - sadly legal avenues for self-defense options remain out-of-reach thereby increasing risks related homicides occurring around country sometimes repeatedly until prevented through appropriate means enforced upon offenders violating pre-existing statutes (NRA-ILA,2021).

Domestic violence (36 times):

Within this entire collection of texts, the term 'domestic violence' has been utilized with great frequency and holds considerable significance in our current discourse. The mention of domestic violence was an unexpected occurrence as a private matter such as this can have significant public ramifications. As per a research paper released on 31 May 2021 with the title "The impact of domestic violence in lethal mass shootings within America between the years of 2014 to 2019", it is evident that there exists a significant correlation between US mass shootings and incidents involving domestic abuse. Domestic abuse related events had higher levels of fatalities as compared to those not relating to such situations; this was found out after analyzing statistics from an estimated figure amounting up-to-68% cases recorded during aforementioned time period including shooting or slaughtering family members/partners among others. On average death tolls for such cases were calculated at around point-eighty four percent whereas only sixteen-point-three victims managed survive their injuries sustained due involvement within these unfortunate occurrences. However, when looking by contrast towards non-domestic associated fatal incidents percentage stands at roughly thirty-seven percent. Further



4 Frequency distribution (line graph)

analysis indicated hybrid forms comprised seventy-four percent which signifies close association regardless if directly involved yet still showcasing influence via history etc., where both parties may have been affected indirectly but remain intertwined nonetheless. Due importance must be given while disarming individuals responsible for any form(s) intimate partner/domestic based harm (Geller et al, Booty & Crifasi). Mass shootings involving domestic violence have a higher fatality rate compared to those not linked with familial ties. A range of motives could be at play in these cases such as revenge, jealousy, desire for control or power, financial issues and even suicidal thoughts (Auchter 2010; Kelley 2009; Zeoli 2018). These factors might lead the perpetrator to target all victims resulting in greater fatalities. Conversely, incidents where the shooter's motive is fewer clear leads to more indiscriminate firing causing fewer fatalities due to gunshot wounds. In-depth research on firearm types and emergency response times are needed for investigating differences between these two categories of mass shooting events as well as how they influence outcomes.

Gun ownership (21 times):

It is an undeniable fact that the United States possesses a remarkable 393 million firearms privately owned by civilians, which equates to each individual owning one gun and still leaving behind as many as 67 million. Despite consisting of just 4% of the world's population, Americans possess almost half

(46%) of all civilian guns across the globe- standing at around857 million in total. Boasting a firearm ownership rate towering over any other nation globally, the US has reached a level so immense with120.5guns for every100 people that it easily surpasses Yemen who follows next but falls far behind with less than half this figure. Crossing borders from America shows India being closest in terms of possessing numerous firearms yet they are nowhere close by comparison even without including law enforcement or military owned weaponry; for instance, a staggering71.1millionindividualspossess personal firearms. Comparatively speaking, it stands out like no other wealthy country regarding gun possession rate since it carries more than to triple the gun ownership events over Canada and more than six times over OECD's average rates (Ingraham, 2018).

Mental illness/ Mental health (42 times):

Numerous individuals link grave mental ailments, such as psychotic disorders or schizophrenia, with violent actions and incidents of mass shootings. It is imperative to recognize that severe psychosis-related illnesses do not typically play a decisive role in most cases involving mass killings or related events. A meagre 5% of these occurrences are connected directly with serious mental illness. While approximately one-fourth of all instances (roughly 25%) stem from non-psychotic psychiatric conditions along the lines of depression and about an estimated 23% arise due to substance abuse; however, it's noteworthy that those factors often serve no significant purpose when considered within this context specifically. Tragically enough though - many people who lack expertise on matters concerning mental health tend towards regarding immoral conduct in tandem with having some form(s) of psychological affliction/impairment. Such comparisons remain fallacious generalizations while discussing heart-wrenching catastrophes like public shooting sprees for which validity should be thoughtfully examined rather than taken at face value (Smith et al., 2019).

Gun Violence Archive (34 times):

An American nonprofit organization by the name of Gun Violence Archive (GVA) has a website and social media delivery platforms to document every case involving gun violence in the United States. Michael Klein, who established Sunlight Foundation, joined forces with Mark Bryant – a retired systems analyst- as co-founders of GVA (Wikipedia Contributors, 2019a).

Not found:

Any religious or racial bigrams are not found. Even not a single word regarding these fields has been used throughout media discourse.

Findings with Sentiment analysis:

According to, Textblob, in this corpus there is 800 positive words and 1031 negative words.

With PatternAnalyzer, the polarity of whole corpus is 0.02360986808018737 and subjectivity is 0.3705523036583183. With NaiveBayesAnalyzer, the result is classification='pos', p_pos=1.0, p_neg=3.4663562899758685e-293.

Polarity scores fall within a range of -1 to 1, with -1 indicating the use of highly negative words such as 'disgusting', 'awful', and 'pathetic', while 1 represents the use of highly positive words like 'excellent' and 'best'. Meanwhile, subjectivity scores are rated between 0 and 1 to indicate the extent of personal opinion conveyed in a sentence. If a sentence has a high subjectivity score, approaching 1, it suggests that the text contains more personal opinion than factual information (Analytics Vidhya, 2021).

Since, polarity of the corpus is 0.02 which is not even close to 1, therefore the whole corpus delivers negative sentiment and subjectivity is 0.37 which is again not close to 1 meaning this media corpus is more factual than opinionated. Therefore, PatternAnalyzer did amazing job.

The result shown by NaiveBayesAnalyzer is very confusing, since it is saying the whole corpus is positive.

According to VADER, corpus has 2532 negative words and 913 positive words and as polarity scores it is showing 'neg': 0.208, 'neu': 0.738, 'pos': 0.054, 'compound': -1.0, meaning overall text is negative, which is quite right.

VADER is a powerful tool that not only identifies whether a lexicon is positive, negative, or neutral, but also assesses the degree of sentiment in a sentence. The results are presented in a Python dictionary with four keys and their corresponding values: ‘neg’, ‘neu’, ‘pos’, and ‘compound’. The Compound score is especially useful, as it normalizes the other 3 scores (neg, neu, pos) between -1 and +1. In terms of decision criteria, the scoring system is similar to that of TextBlob: -1 indicates a highly negative sentiment, while +1 suggests a very positive one (Analytics Vidhya, 2021).

Conclusion:

The impartiality and objectivity for which American media is known is widely recognized when it comes to reporting on any event, particularly mass shootings. The sensitivity of the topic has not diminished their professionalism in maintaining an unbiased approach; they have never ridiculed a particular race or religion. Stereotyping or generalizing that could result in demonization has been carefully avoided by those who work within this field; emphasizing individual responsibility over casting blame upon entire groups of people characterized what was reported. Furthermore, condemning hate speech and bigotry directed towards specific demographics were always done promptly if such events occurred. Promoting cultures rooted in understanding rather than intolerance without compromising accuracy upheld

journalistic standards at all times - showcasing contributions made by various races & religions to America's social landscape whenever possible reinforced these beliefs even further! In short: US journalism embodies fairness/objectivity while avoiding marginalization after severe tragedies like mass shootings.

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