Beyond Red and Blue in Crisis Communication: How Computational Mapping Reveals Gun Control News Coverage of Mass Shootings

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Abstract

News media coverage of mass shootings can influence public understanding of these tragedies and potential policy responses. This study examines whether the inclusion of gun control discussions in mass shooting coverage is primarily driven by regional journalism cultures or by political polarization. We analyzed 55,959 news articles from 4,014 outlets across 49 states published between 1979 and 2024, using computational methods in text analysis to identify gun control mentions and measure their sentiment. Our findings challenge assumptions about partisan media divides. Regional differences were three times more predictive of gun control mentions than political affiliation. The Midwest mentioned gun control in only 6% of coverage compared to 26% in the West and 25% in the Northeast, a pattern that persisted even after controlling for state political lean. Surprisingly, purple swing states showed the lowest gun control mention rates at 11%, suggesting strategic avoidance in politically contested markets. When articles did mention gun control, they exhibited slightly more positive sentiment, indicating a shift from tragedy-focused to solution-oriented framing. These results reveal that geography creates distinct journalistic ecosystems that shape crisis communication more powerfully than red versus blue politics. The exclusion of policy discussions in certain regions affects democratic deliberation on preventing mass violence. Understanding these geographic patterns in news production can guide the development of more effective crisis communication strategies and enhance public discourse about recurring tragedies.

1 Introduction

Mass shootings have become a defining crisis of contemporary American life, sparking intense debates about causes and solutions. News media play a critical role in crisis communication, not only informing the public but also framing potential responses through their coverage decisions [1, 6]. The framing of mass shootings is particularly consequential because it can elevate certain policy solutions, such as gun control, while sidelining others. However, previous research suggests that most mass shooting coverage remains episodic, focusing on victims and perpetrators rather than broader structural debates [5].

While public discussion assumes a stark partisan divide—with liberal outlets emphasizing gun control and conservative outlets avoiding it—the reality may be more complex. Decades of journalism research highlight the enduring influence of regional news cultures and local community norms [8]. A mass shooting in California may be covered differently than one in Kansas, not only because of political leanings but also because of local journalistic traditions and audience expectations.

This paper uses computational methods in text analysis to examine nearly five decades of mass shooting reporting across 49 states and over 4,000 media outlets. We investigated three questions: whether geographic region predicts gun control mentions in coverage, whether state-level political lean adds explanatory power beyond geography, and whether including gun control changes the emotional tone of reporting. Despite widespread assumptions of a polarized red versus blue media environment, we do not know whether regional journalism cultures or partisan politics primarily drive the inclusion of policy debates in crisis coverage.

2 Literature Review

Crisis communication research emphasizes media's role in interpreting events and suggesting responses through framing [2]. The distinction between episodic versus thematic framing is particularly relevant: event-focused reporting emphasizes immediate impacts, while thematic reporting situates events within broader societal structures. However, studies consistently show that policy frames remain rare in mass shooting coverage [3].

Regional journalism cultures may explain this variation. Media sociology demonstrates that local news practices reflect community norms and institutional histories [4]. Newsrooms in urban centers may have resources for interpretive journalism, while rural outlets rely on wire services. This suggests mass shooting coverage varies across regions, reflecting differences in how local media view policy debates' relevance.

Political polarization also shapes media content. Research documents increasing alignment between outlets and partisan audiences [7]. Gun control has become deeply polarized in American politics, potentially influencing journalistic decisions based on state-level political environments and audience expectations. Finally, sentiment analysis offers insight into coverage consequences. When journalists connect shootings to policy solutions, they introduce forward-looking frames implying agency and change possibility, potentially shifting emotional tone from pure despair toward action-oriented language.

3 Methodology

3.1 Data Collection

Data collection involved systematic web scraping and news aggregation APIs to gather articles from national and local outlets. The data collection process utilized search criteria that included keywords such as 'mass shooting,' 'shooting rampage,' and 'active

shooter.' To maintain data quality for analysis, preprocessing was necessary to remove HTML tags, advertisements, and duplicate content from the raw text. To ensure coverage, articles under 100 words, often breaking news alerts, were excluded.

Following preprocessing, state identification was achieved through location extraction, city-to-state mapping, and regex patterns, which was crucial for analyzing regional differences in media coverage. To understand the political context of media coverage, political classification was based on 2020 presidential margins: red states (Republican margin >5%), blue states (Democratic margin >5%), and purple states (margin <5%). Gun control mentions were identified through keyword searches including 'gun control,' 'gun laws,' 'second amendment,' and related policy terms.

3.2 Analytical Procedures

We analyzed 55,959 news articles about mass shootings published between 1979-2024 across 49 U.S. states and 4,014 unique media outlets. Articles were categorized by region (West, Northeast, South, Midwest), state-level political lean (red, blue, purple), and gun control mentions (binary coded). Computational sentiment analysis generated continuous scores ranging from -1 (most negative) to +1 (most positive). We used VADER (Valence Aware Dictionary and sEntiment Reasoner) for calculating sentiment scores.

Given our large dataset, we emphasize effect sizes alongside statistical significance, as trivial differences can achieve significance with large samples. We selected statistical tests appropriate for variable types: Chi-Square Tests of Independence for categorical relationships, with Dunn-Sidak corrections for multiple comparisons, and Welch's t-test for comparing sentiment means between unequal groups.

4 Results

4.1 Regional Differences in Gun Control Mentions

Regional analysis revealed striking patterns addressing our first research question:

> **RQ1:** Are there regional differences in whether news coverage of mass shootings mentions gun control policies?

The West (25.97%) and Northeast (24.78%) mentioned gun control at nearly identical rates, while the South (16.36%) and especially the Midwest (6.08%) showed dramatically lower rates. Chi-square analysis confirmed significance: $\chi^2(3) = 2{,}517.94$, $p < 0.001$, with Cramér's $V = 0.212$ indicating small-to-medium effect size.

Table 1: Gun Control Mentions by Region

Region	N Articles	Gun Control	No Gun Control	Gun Control %	% of Total
Northeast	7,104	1,760	5,344	24.78%	12.7%
Midwest	16,478	1,002	15,476	6.08%	29.4%
South	18,486	3,025	15,461	16.36%	33.0%
West	13,891	3,608	10,283	25.97%	24.8%
Total	**55,959**	**9,394**	**46,565**	**16.78%**	**100%**

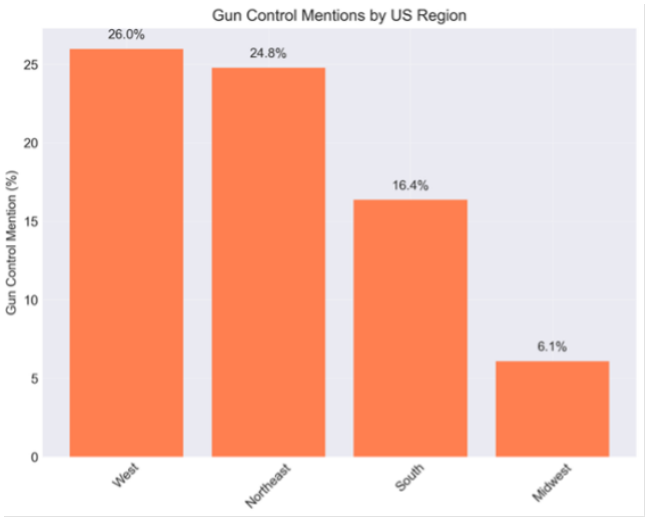

Figure 1: Bar chart showing regional percentages with confidence intervals

Post-hoc comparisons revealed five of six regional pairs differed significantly ($\alpha = 0.0085$). The Midwest-West comparison showed the largest effect (Cramér's $V = 0.276$). Standardized residuals pinpointed sources: the Midwest was massively underrepresented in gun control mentions ($z = -33.55$), while West and Northeast were overrepresented ($z = 26.42$ and $z = 16.43$, respectively). Values exceeding ±2 indicate significant departures from expected frequencies.

These computational findings suggest geography creates distinct journalistic cultures. The Midwest's avoidance may reflect cultural sensitivities around gun ownership or reliance on episodic wire reporting. West Coast and Northeastern outlets may have institutional capacity for interpretive journalism integrating policy debates.

4.2 Political Lean Effects

Our second research question examined political influences:

> **RQ2:** Do state-level political leanings (red, purple, blue) predict differences in whether news coverage mentions gun control policies?

Political lean showed weaker effects: blue states (18.94%), red states (16.39%), and surprisingly, purple states lowest (11.11%). While statistically significant [$\chi^2(2) = 295.63$, $p < 0.001$], the effect was modest (Cramér's $V = 0.073$).

Table 2: Gun Control Mentions by Political Lean

Political Lean	No Gun Control	Gun Control	Total	% Mentioning	Odds Ratio	95% CI
Blue	21,924 (81.1%)	5,123 (18.9%)	27,047	18.94%	1.00 (Reference)	-
Purple	7,847 (88.9%)	981 (11.1%)	8,828	11.1%	0.51	0.47-0.55
Red	16,793 (83.6%)	3,291 (16.39%)	20,084	16.39%	1.59	1.46-1.72
Total	46,564 (83.22%)	9,395 (16.78%)	55,959	16.78%	-	-

Logistic regression including both predictors revealed geography's dominance. The model's pseudo $R^2 = 0.066$ indicated modest

explanatory power. Even controlling for politics, regional effects remained powerful: Northeast articles were 6.7 times more likely to mention gun control than Midwest articles (OR = 6.70), while West articles showed 6.36 times higher odds. Political effects were weaker: red states increased odds only 1.59 times versus blue states.

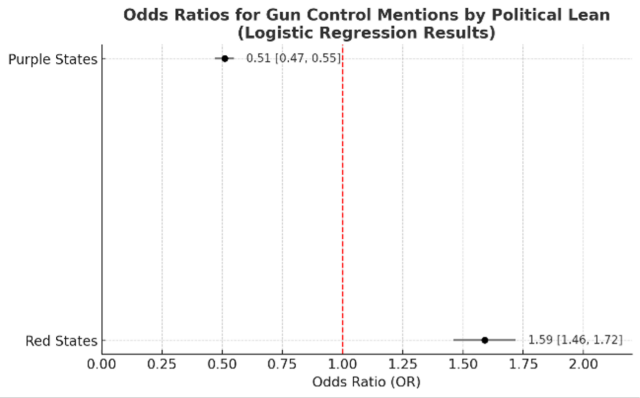

Figure 2: Coefficient plot from logistic regression showing odds ratios with confidence intervals

The "purple state paradox"—lowest mention rates in swing states—likely reflects journalistic caution in contested environments, where reporters avoid polarizing frames to prevent audience alienation.

4.3 Sentiment Analysis

Our third research question explored emotional tone:

> **RQ3:** When news coverage includes gun control mentions, does the sentiment of coverage differ from coverage that does not mention gun control?

Sentiment analysis revealed subtle but consistent differences. Articles mentioning gun control averaged 0.0372 (SD = 0.0674) versus 0.0268 (SD = 0.0985) for those without mentions. Welch's t-test confirmed significance: $t = 15.83$, $p < 0.001$, with Cohen's $d = 0.123$ indicating small effect size.

Table 3: Sentiment Scores for Articles With vs. Without Gun Control Mentions

Group	N	Mean Sentiment	SD
Gun Control Mentioned	13,097	0.0372	0.0674
No Gun Control Mention	113,456	0.0268	0.0985

Table 4: Sentiment Scores Comparison

Comparison	Mean Difference	95% CI	Welch's t	p-value	Cohen's d
Mention vs. No Mention	0.0104	[0.0091, 0.0117]	15.83	< 0.001	0.123

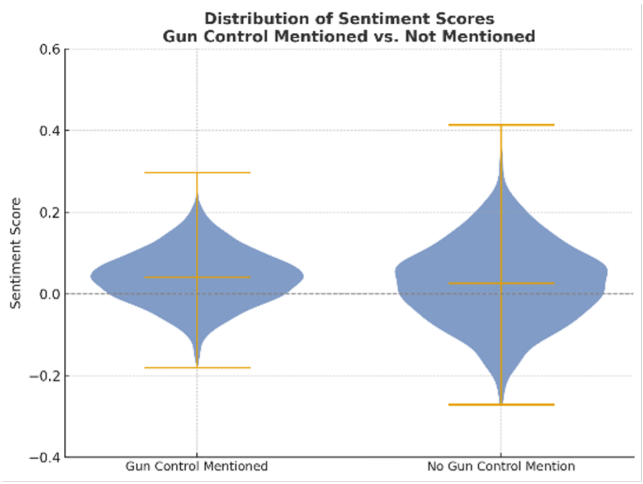

Figure 3: Violin plots showing sentiment distribution for both groups

Though numerically small, this 0.0104 difference is meaningful for journalistic tone. Articles mentioning gun control are slightly less negative, containing more solution-oriented language. Policy discussions introduce forward-looking frames suggesting preventability and action, contrasting with purely episodic coverage emphasizing unresolvable tragedy.

5 Discussion

5.1 From Regional Cultures to Policy Frames

Our computational analysis of nearly 56,000 articles reveals that geography, not partisan politics, primarily drives gun control framing in mass shooting coverage. This finding challenges assumptions about red versus blue media polarization. Instead, results suggest deeply ingrained regional media cultures shape coverage through institutional histories, resource availability, and audience expectations.

The Midwest's near-complete avoidance of policy framing (6.08% mention rate) contrasts sharply with coastal regions' consistent inclusion (>24%). This geographic clustering indicates that place-based journalism practices transcend individual outlet decisions, creating systematic regional differences in crisis communication approaches.

Political lean matters but remains secondary. The purple state paradox—where swing states show lowest policy mention rates—suggests that journalistic caution in contested environments may actually reduce policy discourse rather than balance it. This has implications for democratic deliberation: areas needing policy discussion most may receive it least.

Sentiment analysis demonstrates that computational methods can detect subtle framing effects invisible to traditional content analysis. When journalists include policy discussions, they subtly shift coverage toward solution-oriented language, even within overall negative reporting about tragedies.

5.2 Implications

These findings have significant implications for computational communication research and journalism practice. For researchers, results underscore the importance of incorporating geographic context into models of news production. Simple partisan classifications miss complex regional dynamics shaping coverage patterns.

For journalism, the findings suggest that local newsroom practices and historical traditions may be as important as political orientation in determining how society processes recurring tragedies. The geographic clustering of policy discussion indicates that crisis communication operates through regional ecosystems, not just individual editorial decisions.

Methodologically, this study demonstrates how large-scale computational analysis can reveal patterns invisible in case studies. By analyzing coverage across five decades and thousands of outlets, we identified systematic regional effects that smaller studies might miss.

5.3 Limitations and Future Research

Our binary coding of gun control mentions, while reliable for computational analysis, cannot capture nuanced policy discussions. Future research might employ more sophisticated natural language processing to identify specific policy frames. Additionally, our regional categories, while standard, may obscure state-level variation within regions.

The sentiment analysis, though revealing systematic differences, captures only valence, not specific emotions like anger, fear, or hope. Advanced computational approaches could examine how policy framing affects specific emotional responses in coverage.

6 Conclusion

By applying computational methods to nearly five decades of mass shooting coverage, this study reveals that place matters more than politics in crisis communication. Regional journalism cultures, developed through institutional histories and audience relationships, create systematic differences in how mass shootings are framed for public understanding. While political polarization receives significant attention, our findings suggest that geographic context provides a more powerful framework for understanding variation in crisis coverage.

These patterns have consequences for democratic discourse about recurring tragedies. When policy discussions cluster geographically, entire regions may be systematically excluded from national conversations about solutions. Understanding these dynamics through computational analysis provides a foundation for more equitable and effective crisis communication in American media.

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