University of Trento
Department of Sociology and Social Research
Computational Social Science
LORENZO D'AMICO

"Media Reactions and Sentiment Analysis after the 2024 Attempted Assassination of Donald Trump: A BERT and LDA-Based Approach"

***Abstract*—This study investigates media coverage and public sentiment following the assassination attempt on former U.S. President Donald Trump in July 2024. By analyzing over 3,700 news articles collected from domestic and international sources via NewsAPI and GDELT, this research explores how various media outlets framed the event and how political biases influenced public opinion. The articles were categorized from highly negative to highly positive using BERT (Bidirectional Encoder Representations from Transformers) for sentiment analysis. The sentiment distribution revealed a predominantly negative tone, especially about security failures and political leadership, with notable polarization across news sources. Additionally, Latent Dirichlet Allocation (LDA) was employed for topic modeling, uncovering eight main themes, including political discourse, public reactions, media bias, and security concerns. The findings highlight the media's role in shaping public perception during politically charged events, demonstrating how media narratives can reinforce societal divisions. This study underscores the need for balanced and transparent reporting, especially during critical political moments, and offers insights into the intersection between media bias, public sentiment, and political outcomes.**

I. INTRODUCTION

In recent years, the role of the media in shaping public perception has become increasingly critical, particularly in the context of high-profile political events. On July 2024, an attempted assassination of former U.S. President Donald Trump during a political rally in Pennsylvania attracted extensive media attention. Such events, beyond their immediate political ramifications, offer a unique opportunity to analyze the media's coverage and the public sentiment that ensues.

The central research question posed in this study is: How did various media outlets cover the attempted assassination of Donald Trump, and what were the prevailing sentiments and topics discussed?

To address this research question, a custom dataset was constructed using NewsAPI and GDELT, two prominent platforms that aggregate news articles from a diverse array of sources worldwide. These platforms provided access to thousands of articles related to the event. The sentiment of the articles was analyzed using BERT (Bidirectional Encoder Representations from Transformers), a pre-trained language model capable of capturing intricate nuances in language. BERT was employed to classify the sentiment of each article on a scale from 1 to 5 stars, with 1 star indicating highly negative sentiment and 5 stars indicating highly positive sentiment.

In parallel, Latent Dirichlet Allocation (LDA) was used for topic modeling, a technique designed to uncover the hidden thematic structures within the media coverage. By applying LDA, we were able to identify and analyze the dominant topics discussed in the media's portrayal of the event, including themes such as political implications, security concerns, and public reactions.

Furthermore, to ensure transparency and reproducibility, the scripts used for data collection, preprocessing, and analysis, as well as the results of the study, are made publicly available through a GitHub repository:

https://github.com/lorenzo-damicods/-Sentiment-and-Topic-Analysis-on-a-Major-Political-Event-

The following sections of this paper are structured as follows: Section II presents a comprehensive review of the literature relevant to sentiment analysis, topic modeling, and media coverage of political events. Section III outlines the methodology, including the steps taken for data collection, text preprocessing, and topic modeling. Section IV discusses the key results obtained, while Section V provides a critical analysis of the limitations of the study and presents recommendations for future research.

II. LITERATURE REVIEW

II. A. Political Assassinations and Media Coverage in the United States

Political assassinations have historically had profound implications on the U.S. political landscape, with far-reaching effects on public opinion, governance, and media narratives. According to Martinez (2017), assassinations and attempted assassinations in U.S. history, such as those involving Abraham Lincoln, John F. Kennedy, and Ronald Reagan, have not only shaped national policies but also prompted shifts in media coverage and public sentiment. These high-profile events underscore how the media, often functioning as a gatekeeper, frames political violence, either amplifying or mitigating public reactions.

In Feinman's (2015) exploration of assassination attempts, he emphasizes that political violence, especially when directed at

sitting presidents or prominent political figures, triggers a unique kind of media frenzy. This often results in polarized reporting, where left-leaning and right-leaning outlets may frame the event differently, depending on the political context and the individual involved. The attempted assassination of Donald Trump in 2024 falls within this historical context, making it essential to examine how the media portrayed this event and the role political bias played in shaping public sentiment.

II. B. Sentiment Analysis in Political Discourse

Sentiment analysis has emerged as a key method for understanding the tone of political discourse, especially in the age of digital news and social media. In his seminal work, Bing Liu (2012) provides a detailed account of how sentiment analysis can be used to classify opinions in text, with particular relevance to political news coverage. The introduction of advanced models, such as BERT (Bidirectional Encoder Representations from Transformers), has further enhanced the ability to detect nuanced sentiments in media articles. Romero (2014) and Pang and Lee (2012) also stress the importance of sentiment analysis for political opinion mining, noting how sentiment models can capture subtle variations in tone that may reflect a media outlet's ideological leanings.

In the context of the Trump assassination attempt, sentiment analysis using BERT allows for the quantification of public opinion across different media outlets. By categorizing articles from major news sources into five sentiment categories (from highly negative to highly positive), this study seeks to uncover whether media bias influenced the sentiment portrayed in coverage. Such a method is essential to understand the role of language in framing political violence and the varying emotional responses across the political spectrum.

II. C. Topic Modeling and Media Framing

In addition to sentiment analysis, topic modeling provides valuable insights into the themes and narratives that emerge in media coverage of politically sensitive events. Latent Dirichlet Allocation (LDA), as discussed by Blei et al. (2003), remains one of the most widely used techniques for discovering hidden structures within large text datasets. In this context, Burleigh (2021) highlights how LDA has been used to identify dominant themes in the coverage of political assassinations and attempted assassinations, including narratives around national security, political stability, and public reactions.

For this study, LDA was employed to identify ten key topics from over 3,700 articles related to the Trump assassination attempt. These topics include discussions surrounding Trump's political standing, security failures, and public opinion on political violence. The ability to automatically detect and categorize topics provides a deeper understanding of how different aspects of the event were covered and prioritized by the media. Furthermore, Freedman (2018) suggests that media coverage of political violence can heavily influence how such events are remembered, with certain narratives often becoming dominant based on the media's focus.

II. D. Historical Context of Assassination Attempts and Media Bias

Previous research on assassination attempts, particularly those that targeted high-profile figures such as John F. Kennedy and Ronald Reagan, provides important historical context for understanding media reactions to political violence. Reston (2005) notes that the Kennedy assassination marked a turning point in how the media covered political violence, with the event forever altering the relationship between the press and the presidency. Similarly, the attempt on Reagan's life in 1981, as examined by Lambert (1998), offers insights into how the media framed the event in the broader context of national security and political stability.

The study of Berlusconi's attack in 2009 also serves as a useful comparison. Though not an assassination attempt in the same vein, Poole (2015) argues that Berlusconi, like Trump, was a polarizing figure, and the media's framing of the event largely reflected the political divides of the time. By examining these historical examples, this study builds on the understanding of how political assassinations and attempts are often used by the media to push certain narratives, whether focusing on political instability or personal resilience.

By situating the 2024 assassination attempt on Donald Trump within the broader historical and methodological frameworks discussed, this study aims to contribute to the growing body of research on media bias, public sentiment, and political violence.

	source	author	title	description	url	publishedAt	content	collectedAt
0	{'id': None, 'name': 'Gizmodo.com'}	Lucas Ropek	Trump Shooter Searched for Porn and Political ...	Police have theorized the man wanted to conduc...	https://gizmodo.com/trump-shooter-searched-for...	2024-07-19T19:30:25Z	Despite the fact that they've already cracked ...	2024-08-18T21:25:40.083045
1	{'id': 'the-verge', 'name': 'The Verge'}	Gaby Del Valle	Crypto CEO steps down after posts endorsing po...	Selkis claimed the shooting was an 'inside job...	https://www.theverge.com/2024/7/19/24202046/ry...	2024-07-19T20:03:30Z	Ryan Selkis, the co-founder and CEO of the cry...	2024-08-18T21:25:40.083045
2	{'id': 'the-verge', 'name': 'The Verge'}	Gaby Del Valle	The FBI got into the Trump rally shooter's pho...	The tool helped investigators break into Thoma...	https://www.theverge.com/2024/7/19/24201935/fb...	2024-07-19T15:53:34Z	The FBI got into the Trump rally shooters phon...	2024-08-18T21:25:40.083045
3	{'id': None, 'name': 'Gizmodo.com'}	Matt Novak	Trump Shooter Used Drone Like a 'Rearview Mirr...	Thomas Matthew Crooks, the man who tried to ki...	https://gizmodo.com/trump-shooter-used-drone-l...	2024-07-24T18:15:15Z	Thomas Matthew Crooks, the 20-year-old man who...	2024-08-18T21:25:40.083045
4	{'id': 'business-insider', 'name': 'Business I...	Erica Star Domena,Tamara Lindstrom	Bodycam video of Trump rally shooting released...	Butler County police released bodycam footage ...	https://www.businessinsider.com/trump-shooting...	2024-08-09T18:30:46Z	Butler County police released bodycam footage ...	2024-08-18T21:25:40.083045
...	...	...	...	...	...	...	...	...
3696	{'id': None, 'name': 'Wonkette.com'}	Marcie Jones	Trump And Musk Have Sweaty Dong-Honking	It was a slurring, rambling, lying	https://www.wonkette.com/p/trump-and-musk-have...	2024-08-13T20:20:50Z	In case you missed it, Donald J.	2024-08-22T06:39:40.018198

III. RESEARCH METODOLOGY

III. A. Data Collection

The dataset for this study was constructed using articles and social media posts related to the July 2024 assassination attempt on Donald Trump, collected from two primary sources: **NewsAPI** and **GDELT**. These APIs provided a comprehensive collection of articles from both domestic and international media outlets, ensuring diverse coverage of the event. In total, 3,700 articles were gathered, spanning the period from July to mid-August 2024, allowing for an in-depth exploration of media narratives and public reactions.

To provide a clearer understanding of the data used, the initial structure of the dataset is displayed, showcasing the various columns and types of information collected (e.g., article title, publication date, content). This overview offers a snapshot of how the data is organized for subsequent analysis.

III. B. Text Preprocessing

Before conducting the analysis, several preprocessing steps were applied to the text to ensure compatibility with the models and improve overall accuracy. The steps involved cleaning the text, removing punctuation, and lemmatizing words, as well as eliminating stop words to reduce noise and enhance the quality of sentiment and topic modeling.

The specific preprocessing techniques used were based on S. Bird, E. Klein, and E. Loper (2009), as implemented through the **nltk** library. These steps are detailed below:

1. *Stopword Removal*: Common words such as "the" and "is" were removed to eliminate noise and focus the analysis on more meaningful terms. This technique follows the guidelines provided by Bird, Klein, and Loper (2009).

2. *Lowercasing*: All text was converted to lowercase to ensure uniformity, preventing issues with case sensitivity that could lead to inconsistencies in token matching.

3. *Tokenization and Lemmatization*: The text was tokenized (split into individual words), and lemmatization was applied to reduce words to their base forms (e.g., "running" to "run"). This ensures consistency across the dataset, allowing for more accurate word analysis.

4. *Handling Missing Data*: Articles with insufficient information were either discarded or filled appropriately to ensure the dataset remained robust and complete for analysis.

5. *Text Truncation*: Since BERT models have a maximum token limit of 512, longer articles were truncated to fit within this limit, ensuring that each article could be processed without errors during sentiment analysis.

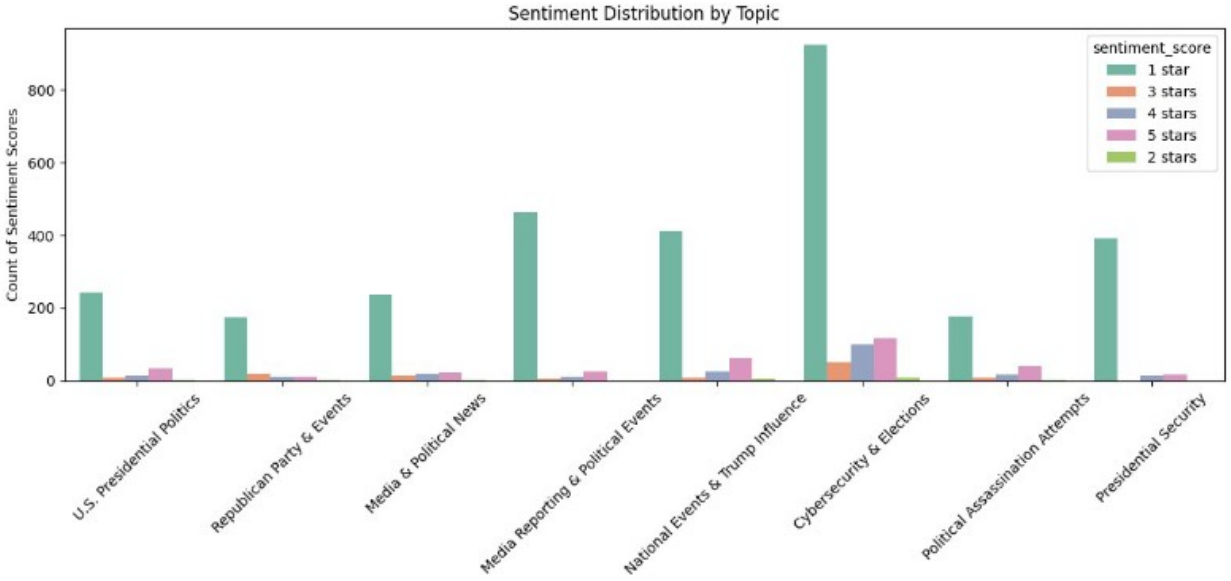
III. C. Sentiment Analysis Using BERT

For the sentiment analysis, we employed **BERT** (Bidirectional Encoder Representations from Transformers), using a **pre-trained model from HuggingFace**, specifically nlptown/bert-base-multilingual-uncased-sentiment. This model was selected due to its proficiency in analyzing multilingual data, which was crucial as our dataset included both domestic and international media coverage. Additionally, this model is designed to classify sentiment on a 5-star scale, where:

- 1 star indicates highly negative sentiment,
- 5 stars indicates highly positive sentiment.

The choice of **BERT** for this project was driven by its ability to understand nuanced human language, a significant improvement over traditional bag-of-words models. Unlike older methods, which treat words in isolation, BERT captures the relationships between words in context, making it particularly effective for analyzing politically charged language. This contextual understanding is critical for an event like the assassination attempt on Trump, where emotions and biases in the media coverage can be subtle and complex.

After running the BERT sentiment analysis, we generated sentiment scores for each article in the dataset. The resulting sentiment distribution, visualized in a bar chart, reveals that the majority of articles scored 1 star, indicating a predominantly negative tone in the media coverage following the assassination attempt. This analysis provided us with a comprehensive view of how the event was framed and perceived across various outlets.


Sentiment Distribution by Topic
sentiment_score
1 star
3 stars
4 stars
5 stars
2 stars
Count of Sentiment Scores
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200
400
600
800
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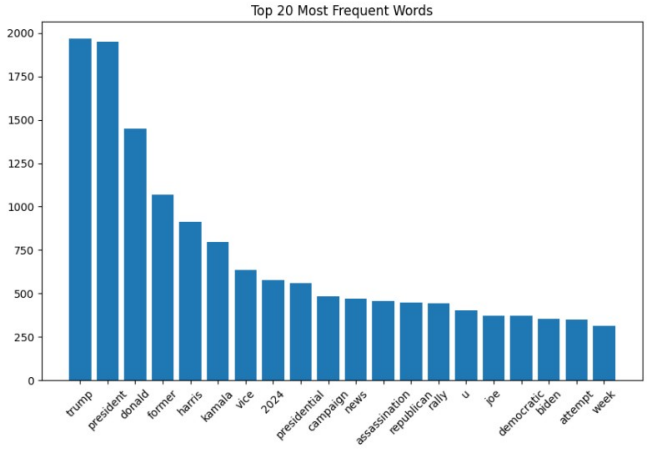
Media & Political News
Media Reporting & Political Events
National Events & Trump Influence
Cybersecurity & Elections
Political Assassination Attempts
Presidential Security


Top 20 Most Frequent Words
0
250
500
750
1000
1250
1500
1750
2000
trump
president
donald
former
harris
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2024
presidential
campaign
news
assassination
republican
rally
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democratic
biden
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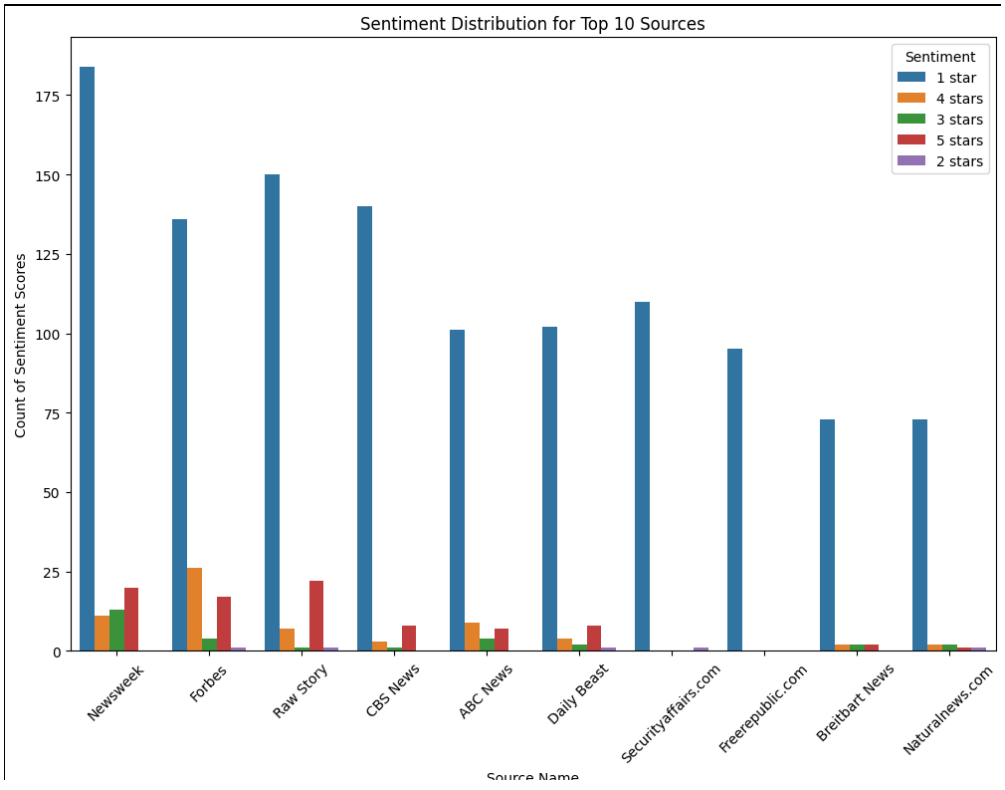
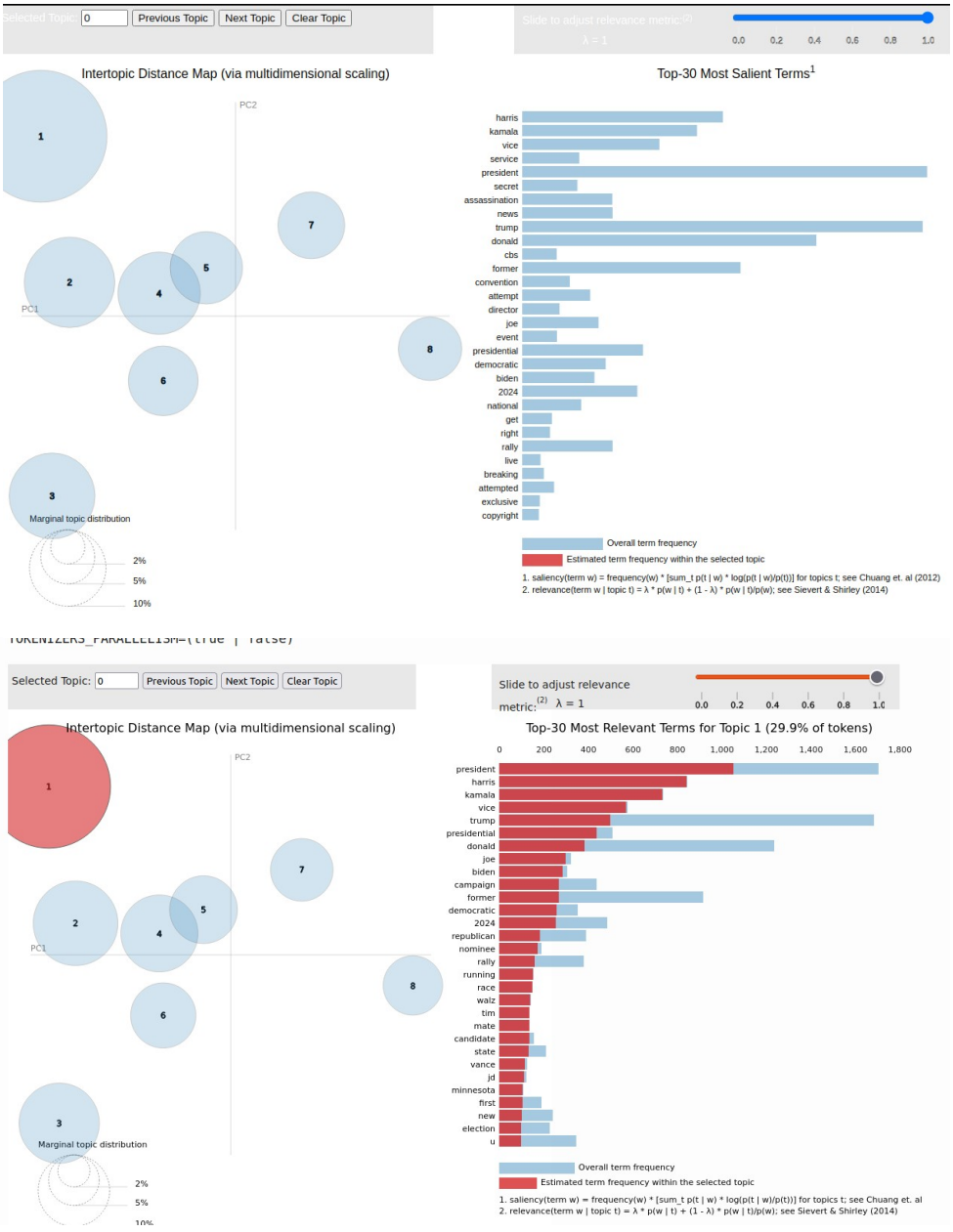

Sentiment Distribution for Top 10 Sources
Sentiment
1 star
4 stars
3 stars
5 stars
2 stars
Count of Sentiment Scores
0
25
50
75
100
125
150
175
Newsweek
Forbes
Raw Story
CBS News
ABC News
Daily Beast
Securityaffairs.com
Freerepublic.com
Breitbart News
Naturalnews.com
Source Name

III. D. Topic Modeling (Latent Dirichlet Allocation – LDA)

The model was run with 8 topics, chosen based on empirical observations to optimize interpretability. Each topic reflects a distinct theme present in the dataset, such as political discussions, security concerns, or media bias. The identified topics help to categorize the text data into meaningful clusters that can be examined independently.

For each topic, I performed sentiment analysis using a pre-trained BERT model, which is known for its robust ability to capture nuanced sentiment in text. The sentiment analysis categorized the articles into five sentiment classes ranging from highly negative to highly positive. This allowed me to assess not only the content but also the emotional tone of the coverage across the identified topics.

The combination of LDA and sentiment analysis provided a comprehensive view of the media's treatment of the event. LDA helped to distinguish key thematic areas, while sentiment analysis gave insight into how these areas were emotionally framed. For example, topics related to security failures exhibited predominantly negative sentiment, while those focusing on political opponents like Kamala Harris displayed a more mixed or neutral sentiment. This methodological approach allowed for a structured analysis of both what the media focused on and how it framed these discussions, offering deeper insights into public and media reactions to politically charged events.



IV. RESULTS AND DISCUSSION

Sentiment Analysis

The sentiment analysis revealed a clear polarization in the media coverage of the assassination attempt. The majority of the articles demonstrated negative sentiment, particularly regarding security failures and Trump's political leadership. This pattern was more pronounced in media outlets critical of Trump, where they emphasized security shortcomings and political consequences. Conversely, articles with positive sentiment, though fewer in number, primarily originated from sources supportive of Trump, focusing on his resilience and leadership. Finally, articles with neutral sentiment tended to balance multiple perspectives, offering a less emotionally charged view of the events.

Topic Modeling and Key Insights

The **LDA model** identified eight main topics that reflect various aspects of media coverage:

- Politics: This was one of the dominant topics, showing mixed sentiment. Media critical of Trump concentrated on the negative aspects of his political actions, while supportive outlets adopted a more positive tone.
- Security: Articles discussing the breach of security were predominantly negative, with widespread concern about the effectiveness of protective measures.
- Media Coverage: Sentiment towards the media itself was mostly negative, highlighting distrust and accusations of sensationalism. Articles criticizing the media questioned the accuracy and intent behind the coverage.
- Public Reactions: Public response to the event, as captured by the media, showed extreme polarization: Trump supporters praised his leadership, while critics strongly condemned his role in escalating tensions.
- Legal Proceedings and Protest Movements: These topics revealed a complex mix of sentiments, with critiques of the legal process and the protests that followed the attack. However, some articles maintained a more neutral and factual tone.
- International Relations: International reactions showed mixed sentiment, with foreign media providing diverse perspectives, often influenced by their respective political contexts.
- Election Influence: Speculation about the impact of the assassination attempt on the 2024 elections generally carried a neutral tone, with articles analyzing possible future outcomes without taking a strong stance.

Comparison and Reflection

The combined analysis of sentiment and topic modeling provided a nuanced understanding of how the media and the public reacted to the assassination attempt. As expected, media coverage was largely influenced by the political leanings of the outlets, with polarized sentiments evident in discussions around politics, media coverage, and public reactions. Topics related to security and the assassination were framed overwhelmingly negatively, reflecting public concern over national security. While positive sentiment was limited and concentrated in media outlets supportive of Trump, the majority of articles focused on the broader implications of the event, such as political strategy and public perception. The LDA model helped uncover specific areas of focus, illustrating how different media outlets approached the same event with varying narratives.

IV. CONCLUSION

The results of this study underscore the crucial role that media plays in shaping public perception, particularly during politically sensitive events such as the assassination attempt on Donald Trump in July 2024. Through the combined use of sentiment analysis and Latent Dirichlet Allocation (LDA), a strong polarization in sentiment and thematic structures within the media coverage was revealed. The framing of the event by the media was closely aligned with political affiliations, further contributing to public division.

Sentiment Polarization

Sentiment analysis using the BERT model highlighted significant polarization across different media outlets. Articles that focused on security failures and political implications predominantly displayed negative sentiment, especially from sources historically critical of Trump. In contrast, pro-Trump sources offered a more favorable narrative, centered on his leadership and resilience. This polarization reflects broader societal divisions and demonstrates how media coverage can influence public sentiment.

Key Themes Identified by LDA

The LDA model identified several key themes in media coverage, including:

- Politics: Sentiment related to Trump's political career and responses to the assassination attempt exhibited a range of opinions, with both criticism and support.
- Security: Discussions surrounding security breaches were overwhelmingly negative, driven by public concern.
- Media Criticism: A strong sense of distrust toward the media emerged in numerous articles, criticizing sensationalist and biased coverage.
- Public Reactions: Public opinion was also sharply polarized, with Trump supporters praising his resilience while critics questioned his political actions.

The Role of Media in Shaping Public Perception

This analysis highlights the central role of the media in constructing public perceptions. News outlets often frame events based on their political stance, thus influencing both the tone and content of their coverage. This phenomenon is particularly evident in politically charged events like the assassination attempt, where the narratives created around the event can significantly impact how the public interprets the information.

Implications and Future Considerations

The findings of this study emphasize the need for transparency and balance in media reporting, especially during critical political events. The media's ability to shape public opinion through narrative and sentiment portrayal can exacerbate societal divisions if not carefully managed. The observed polarization suggests that media bias remains a pressing concern in contemporary journalism.

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