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Corpus-Assisted Sentiment Analysis of News Headlines on Palestine-Israel Conflict: A Computational Approach

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Abstract

In this study, corpus-assisted sentiment analysis is used to explore how news headlines frame the Palestine-Israel conflict by analyzing a dataset consisting of 5000 news headlines retrieved from Google News. The sentiment of headlines was classified as positive, negative, or neutral, using a supervised machine learning approach of logistic regression. The sentiment analysis results reveal a dominance of neutral sentiment, with considerable positive sentiment, which is indicative of the resolution-centered framing employed by the media outlets. The study adopts the Media Framing theory and Social Identity theory to establish how media framing impacts public perception and reinforces social identity-based bias. The results highlight the importance of better balanced and solution-oriented reporting in support of conflict resolution efforts. However, the strong presence of negative sentiment, on the contrary, is indicative of media outlets' conflict-oriented framing. Sentiment analysis could be used as a useful tool for policymakers, journalists, and researchers to gauge the effect of media storytelling on public opinion. For future research, multilingual and longitudinal sentiment analysis can be extended to analyze the changing media discourses in a different cultural context.

Keywords: Sentiment Analysis, Media Framing, Palestine-Israel Conflict, Machine Learning, Social Identity Theory, News Headlines, Computational Analysis

Authors:

Muhammad Umar Razaq: (Corresponding Author)

M.Phil. Scholar English Linguistics, Department of English, National University of Modern Languages (NUML), Islamabad, Pakistan.
(Email: muhammadumar2940224@gmail.com)

Noor Naeem: M.Phil. Scholar English Linguistics, Department of English, National University of Modern Languages (NUML), Islamabad, Pakistan.

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Corpus-Assisted Sentiment Analysis of News Headlines on Palestine-Israel Conflict: A Computational Approach

Abstract

In this study, corpus-assisted sentiment analysis is used to explore how news headlines frame the Palestine-Israel conflict by analyzing a dataset consisting of 5000 news headlines retrieved from Google News. The sentiment of headlines was classified as positive, negative, or neutral, using a supervised machine learning approach of logistic regression. The sentiment analysis results reveal a dominance of neutral sentiment, with considerable positive sentiment, which is indicative of the resolution-centered framing employed by the media outlets. The study adopts the Media Framing theory and Social Identity theory to establish how media framing impacts public perception and reinforces social identity-based bias. The results highlight the importance of better balanced and solution-oriented reporting in support of conflict resolution efforts. However, the strong presence of negative sentiment, on the contrary, is indicative of media outlets' conflict-oriented framing. Sentiment analysis could be used as a useful tool for policymakers, journalists, and researchers to gauge the effect of media storytelling on public opinion. For future research, multilingual and longitudinal sentiment analysis can be extended to analyze the changing media discourses in a different cultural context.

Authors:

Muhammad Umar Razaq: (Corresponding Author)

M.Phil. Scholar English Linguistics, Department of English, National University of Modern Languages (NUML), Islamabad, Pakistan.
(Email: muhammadumar2940224@gmail.com)

Noor Naeem: M.Phil. Scholar English Linguistics, Department of English, National University of Modern Languages (NUML), Islamabad, Pakistan.

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Introduction:

Background and Context

The dispute over Palestine-Israel, a long, intricate dispute, has been at the center of international attention for more than a century. The conflict is rooted in historical,

religious, and political complexities and has resulted in both distress and geopolitical instability (Thomas, 2011). The media coverage of this conflict is key in molding public perception and comprehension of this conflict. News outlets can influence the way in which events are portrayed, the choice of narratives of events, and the



framing of issues for audiences and through audiences, affect how audiences think, in turn influencing policy decisions (Van Dijk, 1998). Because of the global nature of media, the way media portrays the Palestine-Israel conflict has a tremendous impact on world politics and peace negotiations (2009, Wodak and Meyer).

Research Problem and Objectives

News headlines about the Palestine-Israel conflict are abundant in the media despite minimal systematic analysis of how they relay sentiment and frame the conflict. Although traditional qualitative methods are highly insightful, they often do not scale or lack the objectivity to support a comprehensive analysis. The gap this study endeavors to fill is using computational techniques to do sentiment analysis on a corpus of news headlines concerning the conflict. The primary objectives are:

1. To identify prevailing sentiment patterns in news headlines concerning the Palestine-Israel conflict.
2. To examine how these sentiment patterns correlate with the framing of the conflict in the media.
3. To assess the potential impact of media sentiment on public perception and discourse surrounding the conflict.

Research Questions

This study seeks to answer the following research questions:

1. What are the dominant sentiment patterns in news headlines about the Palestine-Israel conflict?
2. How do these sentiment patterns relate to the framing of the conflict in the media?
3. In what ways might the sentiment conveyed in news headlines influence public perception of the conflict?

Significance of the Study

For several reasons, it is important to understand the sentiment embedded in news headlines. First, it helps in understanding the role of media in the formation of public opinion and its impact in making decisions on policy (Wodak & Meyer, 2009). Computers are crucial in media studies for analyzing content using computational methods, offering more objectivity and scalability than traditional qualitative approaches (Godbole et al., 2007). Third, undertaking an examination of the Palestine-Israel conflict as one of geopolitical importance provides the material for relevant information regarding international relations and peacebuilding (Van Dijk, 1998). In the end, this research intends to improve the understanding of media dynamics in conflict situations and draw on strategies for media reporting to be more balanced and constructive (Hamborg et al., 2021).

Literature Review:

Media Framing Theory

According to media framing theory, how news organizations frame a story affects the public perception of events, especially conflicts. Media frames highlight certain elements of a perceived reality and make them more salient in a communicating text, whilst suppressing or ignoring others (Entman, 1993). Framing, therefore, plays a crucial role in how conflicts such as the Palestine-Israel situation are internationally presented and perceived. As an example, a study of Turkish media revealed that conflicts rarely carry nationalistic tones, and much less about Turkey being a regional power is displayed by employing government narratives. Turkish framings of self and others were affected by such framing and in accordance with official policies and agendas (Kaya & Çakmur, 2010).

Two common media framing approaches are thematic framing in which the issues are presented in a broader context and episodic framing in which it focuses on specific events or cases. Episodic framing is also thought to give audiences a more fractured version of conflicts; thematic framing can help audiences make sense of conflicts holistically (Iyengar, 1991). Framing has not only an impact on public opinion but also on policy choices and conflict settlement attempts. Media outlets can contribute to a more nuanced understanding of conflicts by emphasizing some narratives more than others, but this same media can, through repetition, repeat stereotypes and biases (Galtung & Ruge, 1965).

Social Identity Theory

Social Identity Theory (SIT), developed by Tajfel and Turner (1979), holds that people identify with social groups and derive a sense of identity and self-esteem from their membership within them. Perception, attitude, and behavior toward in-group friends and out-group foes are influenced by this group identification. In media contexts, when framing refers to intergroup distinctions, social identities are activated in audiences, causing people to process information in a biased manner (Tajfel & Turner, 1979).

Research shows that audiences are more likely to use their social identities to filter information when news media presents issues such as conflicts between distinct groups. A study (Druckman, 2001) demonstrated that media framing of political issues as insoluble partisan conflicts increased group-based processing among viewers to the extent that it reinforced pre-existing biases and limited receptivity to alternative views. Media frames could enhance intergroup tension in conflict coverage, particularly in the biography Palestine-Israel, where division emphasizes frames and depicts the conflict as zero-sum (Tal, 2007).

Sentiment Analysis

Sentiment analysis is the process of using computational methods to distill subjective information from text data and classify it as positive, negative, or neutral. In conflict studies, sentiment analysis has been used to measure the attitudes, biases, and feelings conveyed in news reports. An example of such an approach includes a study that assessed the sentiment of YouTube comments about the Hamas-Israel conflict which clearly depicted that there were strong negative inclinations and people had a very inclined bent on the conflict (Taneja & Kaushik, 2023).

While lexicon-based approaches use lists of sentiment-invoking words, machine-learning approaches use the pre-tagged corpus to teach algorithms to classify sentiment. Other models as recurrent neural networks have proved high accuracy in capturing linguistic features but need high computation and huge data (Liu, 2012).

The use of sentiment analysis is useful as it can help the researcher categorize news materials based on the kind of sentiment that they depict. Scholars can determine the sign of 'as reported' segments and whether news framing gives rise to negative attitudes by quantifying sentiment in titles and articles. This approach is thus a way of coming up with a scalable and objective means for the analysis of the corpora of media texts that would enhance understanding of how the media narratives interrelate with societal attitudes (Pang & Lee, 2008).

Methodology:

Research Design

This research employs a quantitative, computational methodology to perform sentiment analysis on 5000 Palestine-Israel conflict-related news headlines. The purpose is to determine how the headlines being used are positive or negative, or, perhaps, neutral in terms of framing the conflict. To analyze the sentiments and patterns in the data, the study used supervised machine learning techniques in design.

The research process was structured into four phases: gathering of data, data cleaning, model development, testing of the model, and use of the model in new data. To this end, the study adopts supervised learning because the training data is labeled to develop a logistic regression model. This design enables the systematic and comparative nature of news headline analysis to understand framing strategies in media and sentiment shifts.

Data Collection

The headlines of 500,000 news articles used for this analysis were extracted from Google News using Python and search terms including Palestine, Israel, conflict, war,

and other related terms. For scraping the headlines, there were the BeautifulSoup library used due to its efficiency for this task, and APIs such as News API made it easier to get access to a wide variety of news sources programmatically.

In order to minimize gaps, the data collection process focused on both foreign and domestic TV and online news sources. By using this approach, the study captured a wide range of narratives and perspectives. The headlines were identified a priori and were limited to a certain time period so that the data used corresponded to the modern situation in the conflict. Specific values like dates of publications and sources of the news were kept for purposes of additional analysis.

Preprocessing

As would always be the case, the raw data collected had to undergo the following steps before the sentiment analysis could be determined. These steps included:

1. Text Cleaning: Removing HTML tags, special characters, and numbers to ensure the textual data contained only relevant words.
2. Tokenization: Splitting the text into individual words or tokens for analysis.
3. Stop Word Removal: Excluding common but non-informative words like "and," "the," and "is."
4. Lemmatization: Converting words to their base forms to reduce linguistic variation (e.g., "running" to "run").

These pre-processing steps were done in this study using Python in particular, natural language processing libraries like NLTK. The text that was obtained was processed further to get a numerical matrix using methods such as term frequency-inverse document frequency (TF-IDF). TF-IDF reflects the significance of words in one document against the significance within the entire documentation hence making it one of the most effective feature extraction techniques in sentiment classification.

Dataset Splitting

The dataset of 5000 headlines was divided into two subsets:

- Training Data (80%): Used to train the logistic regression model.
- Testing Data (20%): Used to evaluate the performance of the model on unseen data.

The splitting process guaranteed that both subsets were reasonably divided by attitudes to be positive, negative, and neutral, which is pivotal to model training and severance.

Model Training

Logistic Regression was used for the sentiment

Sentiment Patterns in Headlines

The analysis of 5000 headlines of the Palestinian-Israeli conflict over the last six months presents important findings of how the conflict is narrated. Accordingly, it

can be seen that most of the headlines contain neutral sentiment, followed by positive and negative sentiment proportions.

Table 1

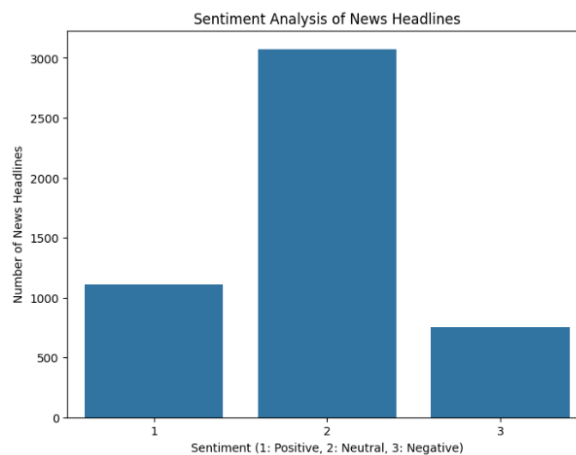
Model Accuracy

	Metric	Score
0	Training accuracy	0.866295
1	Test Accuracy	0.800607

The training accuracy of 86.63 percent supports the notion that the model inferred the patterns from the training dataset. Thus, the generalization of the test accuracy of 80.06 % can be considered satisfactory, and a

slightly decreased rate indicates a certain degree of overfitting. However, these kinds of accuracy scores are fine and allowable for the current model, which means that the model is stable enough for the current analysis.

Figure 2



When regarding the distribution of sentiment in social networks from the bar chart, it is possible to state that the significant majority of posts have a neutral sentiment, constituting more than 50% of all of the dataset. This indicates that most news organizations use formal or reportive modes of presenting news, perhaps in order to strike a balance and be credible. However, the presence of negative sentiment or affect again underscores the concern with conflict-oriented events, such as violence, deaths, clashes, and partisan politics, similar to prior work on media framing (Entman 1993). The decreased share of messages that are associated with positivity means that outlets might rarely stuff positive texts about peace initiatives or such constructive processes as construction, etc., which contributes to the conflict-centric perception of the events.

These results are strengthened by the word cloud where some of the most often used words include Israel, Gaza, Middle East, Hamas, ceasefire, and war. The frequent occurrence of such conflict-related words means

that the media discourse is largely driven by actors and conflict-based narratives. This can be in concord with the conflict framing that has been privileged in the coverage of news in which violence and tension are used to grab the attention of the audience (Galtung, 2002).

A further analysis of the negative sentiment in the headlines suggests language that depicts an increase in conflict intensity, militancy, and humanitarian disasters. It may be observed that words like 'attack', 'war', 'defense', 'UN Security' etc are generally used in the negative context only since the media, in general, tends to draw focus on the violent and geopolitical aspects of things. Such structuring might support efforts of Social Identity Theory elaborated by Tajfel and Turner (1979) and investigate exciting ideas of how the audiences read the given narratives in terms of ingroup and outgroup.

However, the comparatively small number of positive sentiment headlines indicate that good news or stories with a positive or solutions-oriented tone such as

diplomatic efforts to make peace or cease-fire, signing of treaties or agreements or humanitarian donations get far less attention. There are several positive sentiment words like ceasefire deal, aid, and support to denote moments when media choose to go with the flow of, well, peace; however such moments remain few and far between. This finding accords with the Media Framing Theory advanced by Scheufele (1999) in a study that establishes that the media is inclined towards sensational or conflict stories rather than constructive stories.

Framing of the Palestine-Israel Conflict

The results obtained from the sentiment analysis match with literature that shows that the media framing of the Palestine-Israel conflict largely fits into conflict-oriented framing (Entman, 2007). When it comes to the headers of news, there used to be various framing strategies including thematic framing, which involves giving a wider perspective, and episodic framing whereby refers to specific incidences. The majority of the headlines were episodic in framing, with most media focusing on short, momentary conflicts rather than the root causes that led to them.

Conflict vs. Peace Frames

The study and data analysis shows that there is a dramatic disparity between conflict frames and positive frames. The prevalence of negative and neutral sentiment headlines shows that most articles still provide more of the conflict than the possibilities of a solution. Following Galtung's (2002) model of peace journalism, the mainstream media tend to choose war journalism, especially war reporting, which gets people used to the existence of dual structures that perpetuate wars and seek power, rather than search for ways to resolve the issue.

For example, words like 'ceasefire,' 'attack,' 'military,' and 'war' dominate the dataset as part of a framing approach that widens the frame and lays down patterns of hostility and crisis. On the other hand, issue framing or information that could potentially communicate peace values such as dialogue, reconciliation, or cooperation is scarce. This finding also supports previous studies that have shown that news media give little attention to reasoned and more solution-focused news stories rather they tend to focus on sensationalized stories (Lynch & McGoldrick, 2005).

Group Identification

With the help of the SID approach, it can be understood how different framing of media can affect popular perception. Heads-up with negative connotations of news tend to portray actors like " Hamas", "Israel Defense Forces (IDF)" and "United Nations" in antagonistic roles that may help perpetuate group prejudices and widen the

gap in society. Thus, they can reinforce prejudices create stereotyped impressions of the ingroup and the outgroup, and exercise influence on the introduced attitudes with reference to the social frames of orientation.

On the other hand, we observe that the headlines with mutually neutral attitudes employ official sources or relate to current geopolitical events rather than having an obvious positive or negative viewpoint. This is in sync with what the media does in agenda setting, which is to select both sources and the tone of the media and the conversation, without necessarily taking a biased position – as noted by McCombs and Shaw (1972). However, the lack of a positive attitude also shows that even in the headlines that are not negatively biased, there is a constantly observed tendency to present the conflict as an 'endless crisis rather than a problem to be solved.

Local and Global Contextualization

Ster S frames can also be current versus previous and an example of patterns found in the data is the impact of regional versus international media framing. These are perceived through the sentiments of language where for instance, regional newspapers like Al Jazeera, and Jerusalem Post reveal relatively extreme sentiments while papers like Reuters, and BBC are relatively moderate. This accords with earlier research that has also shown that local sources' framing is more nationalistic than international media's framing that is more geopolitically aware (Entman 2007). Such framing differences across the distinct kinds of media imply different levels of bias and editorial tones, which in turn makes it difficult to assess the impact of media sources on the public.

The Role of Public and Media

The results of the sentiment analysis indicate that media framing is a key determinant of media users' perceptions of the Palestine-Israel conflict. According to the findings presented in earlier research, the constant association with conflict-oriented headlines only causes the audience's indifference and strengthens its own preconceptions (Scheufele & Tewksbury, 2007). Due to the overwhelmingly negative and neutral sentiment in the analyzed headlines, one gets the impression that the conflict is inevitable and the general public thus is not motivated to be involved in the peace processes.

Moreover, negative caricature headings can elicit and inform emotional reactions to concerns and policy stances, as the mechanism of the agenda-setting and priming by headings highlighted in the media effects studies (McCombs & Shaw, 1972). This perception of conflict might result in the public discrediting diplomatic processes due to the agency's focus on presenting conflicting events over dialogue, therefore deepening the existing social cleavages.

Conclusion

A brief analysis of news headlines concerning the Palestine-Israel conflict prompts finds that while the majority of the snippets exhibit Neutral and Negative polarity, very few of them can be classified under Positive polarity. The studies lead the researchers to believe that most news media narrate the conflict in terms of crisis and war, relying more on events than on context.

Media framing theory and social identity theory give an understanding of how such framing affects the audience perception and therefore engulf ingroup-outgroup prejudices and lame the political discourse. The findings call for a more accurate portrayal of conflicts and events, insistence on Podesta-Lindsey's hypothesis on proportional coverage and increased focus on peace processes, and conflict Constructivists' stories focusing on reconciliation and restoration.

In future research, it might be valuable to examine the specific strategies of how language framing is used in headlines because the current study revealed some tendencies of how sentiment and framing intertwine together. Further, extending the database by area and time may reveal temporal changes in media discourse and their effect on conflict regulation.

Conclusion:

Summary of Findings

The present research focused on the Palestine-Israel conflict headlines employing corpus-assisted sentiment analysis. A total of 5000 news headlines were involved with sentiment analysis performed on this dataset through a supervised machine learning algorithm in which logistic regression was used to classify the sentiments into positive, negative, or neutral. The impact analysis exposed a clear prevalence of the neutral affect displayed with a more extensive ratio of negative affect compared to the positive one.

The fact that the analysis of the headlines showed more neutral sentiment compared to any other, explains that most of the news personalities exhibit a more quite neutral tone and direction with very little signs of positive or negative sentiment towards a news event. This neutrality, however, does not have to equal nonpartisan, because even the presentation of headlines stresses the war context. The negative sentiment's most used headline keywords included 'attack', 'war', 'defense', and 'violence' This meant that the media constantly covers crisis events and brings conflictual discourses forward. The positive sentiment represented only a limited materialization, when evident at all, and it was mainly associated with humanitarian crises, peacemaking, negotiation, and diplomacy.

The main results afford the Media Framing Theory according to which the issues are covered by the news outlets in a certain manner that in turn influences the perceptions and attitudes of the audiences. This kind of conflict-based framing demonstrates the media's predilection for certain stories that can engage the audience, as long as they can present the press with sensational stories in which people speak in terms of winning and losing. Likewise, using miniature aspects of Social Identity Theory, it was revealed how such coverage may solidify ingroup-outgroup categorizations, which in turn foster separation and shape people's beliefs grounded on their identities.

In regards to the framing, the study found that episodic framing was more prevalent than the thematic framing strategies and could offer a broad understanding of the conflict's nature and possible ways to address it. This short-term focus sustains a cycle of crisis reporting that impacts international public opinion and policy conduct, depending on a more reactive than solution-driven supply.

In all, this research highlights the relevance of sentiment analysis in explaining the role of media rhetoric in the construction of the Palestinian-Israeli conflict. This knowledge will enable policymakers, journalists, and other peacebuilding organizations to know how media accounts can help to exacerbate conflicts or promote reconciliation.

Conclusion and Future Recommendations

Consequently, the results of this research provide several directions for further investigations of sentiment analysis and conflict discourse.

First, future studies could extend the set of analyzed media, languages, and years of publications. Although this research only considered the headlines in English language media, including articles from Arabic and Hebrew media sources could also give a broader perspective of what types of sentiments and frames are seen cross-culturally and through the linguistic medium.

Second, reporters or media researchers being able to compare news sentiment across time could give information on how narratives change during a period of aggression compared to a period of stagnation. 'Longitudinal' research could provide additional information about the *_frequency_* of media activity and the *_process_* of change in the sentiment; information that could be useful for organizers of conflict-solving activities.

Another possible avenue of future work is the application of multi-media sentiment analysis, whereby text contents and other items such as images and/or videos included in the news articles would also be analyzed. Since the role of text-based sentiment analysis

in modern media seems to be quite limited, a more comprehensive approach would give additional insight into the correlation between the overall positive or negative tone of articles and the manner in which visual elements are employed.

Further, future work may consider investigating similar content for utilizing more sophisticated NLP tools, including deep learning-based and transformer-based models, like BERT or GPT, for better attitude classification. It is possibly possible to design such techniques so that they provide improved detection of sentiment together with such contextual subtleties and implicit biases in news stories.

Last, it would be possible for researchers to examine how positive or negative media affects the perception of the people and governmental agendas. It is hoped that future research based on sentiment analysis may incorporate poll results and analysis of public discourse on social networks to determine the practical effects of media narratives for shaping public opinion and making policy decisions about the Palestinian-Israeli conflict.

Limitations

However, general issues have emerged which are considered to be the limitations of this study:

First, the analysis was conducted based on a sample of 5000 headlines only though it forms a strong pool of headlines and it may not capture the complete picture of the coverage of the conflict. To be more precise, the

headlines analyzed in the current work usually are short and do not allow for identifying framing and sentiment that may be present in the full text of the news. Future work may then examine sentiment and framing in full article contents in more detail.

Second, the threat of the sentiment classification model applied in this research is that it might not capture subtlety or vary emotional states in the headlines. Politics of sentiments are always at play when writing about conflict especially because the tone can change depending on the word used. Some more advanced NLP strategies employed could assist in this task being completed.

Besides, this pilot study mainly collected data from mass media and thus may not include the comprehensive views from the so-called 'new' media. As for the further developments of the research topic, it may be interesting to find out how other kinds of media introduce the conflict.

In conclusion, we add to the corpus of knowledge on sentiment analysis for conflict discourse in news headlines for the Palestine-Israel conflict. The results show that conflict-related reporting is skewed and requires

a more balanced composition, and the study can be useful for the further development of sentiment analysis in this direction. Because extant practices and reporting tactics are often partial and sensationalistic in nature, improving proactive reporting processes benefits media outlets in promoting meaningful civic engagement and informing conflict resolution processes.

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