# Sentiment Analysis of Reddit Comments about Israel-Palestine Conflict Following the October 2023 Escalation

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## Abstrak

*Penelitian ini menganalisis sentimen komentar Reddit terkait konflik Israel-Palestina selama dua bulan pertama setelah eskalasi 7 Oktober 2023. Media sosial yang memainkan peran penting dalam membentuk persepsi dan wacana publik tentang peristiwa geopolitik menjadikan analisis sentimen sebagai alat yang berharga untuk menilai reaksi daring. Dengan menggunakan kumpulan data yang telah dikumpulkan sebelumnya "Opini Publik Harian tentang Perang Israel-Palestina" dari Kaggle, yang berisi 389.229 komentar dari 14 subreddit, studi ini menerapkan alat analisis sentimen VADER dalam lingkungan pandas Python. Leksikon VADER, yang dioptimalkan untuk teks media sosial, memungkinkan penilaian polaritas komentar (positif, netral, negatif) dan valensi sentimen secara keseluruhan. Temuan tersebut menunjukkan korelasi antara fluktuasi sentimen jangka pendek dan peristiwa yang dipublikasikan secara luas dalam perang Israel-Hamas, yang menunjukkan bahwa wacana daring bereaksi secara dinamis terhadap perkembangan di lapangan. Penelitian ini berkontribusi untuk kajian linguistik terapan dalam memahami bagaimana bahasa natural dalam komunitas digital secara emosional menanggapi konflik dunia nyata.*

***Kata Kunci:*** *Analisis sentimen, Konflik Israel-Palestina, Media sosial, Reddit, VADER*

## Abstract

This researches analyzes the sentiment of Reddit comments regarding the Israel-Palestine conflict during the first two months following the October 7, 2023, escalation. Social media which plays a critical role in shaping public perception and discourse on geopolitical events making sentiment analysis a valuable tool for assessing online reactions. Using the pre-collected dataset "Daily Public Opinion on Israel-Palestine War" from Kaggle, which contains 389,229 comments from 14 subreddits, this study applies the VADER sentiment analysis tool within Python's pandas environment. VADER's lexicon, optimized for social media text, enables the assessment of comment polarity (positive, neutral, negative) and overall sentiment valence. The findings suggest a correlation between short-term sentiment fluctuations and widely publicized events in the Israel-Hamas war, indicating that online discourse reacts dynamically to developments on the ground. This study contributes to applied linguistics in understanding how natural language in digital communities emotionally respond to real-world conflicts.

**Keywords:** Sentiment analysis, Israel-Palestine conflict, Social media, Reddit, VADER

## 1. Introduction

In the wake of the Israel-Hamas war escalation in early October 2023, there has been a great uproar around social media, with millions of people engaging in internet debates and expressing their views about the conflict on different online platforms through posting, commenting, and interacting with other users. One such platform that hosted a great amount of political discussions is Reddit, which is one of the most popular social media platforms in the world. A combination of Reddit's distinctive characteristics (relatively high level of anonymity of users and high tolerance of explicit and controversial content) makes it a perfect platform for political discussions.

The key purpose of this research paper is to conduct a sentiment analysis of Reddit comments about the Israel-Palestine conflict, sampled during the first two months since the October 2023 escalation. Measuring the attitudes and monitoring the state of debate in social media concerning the Israel-Palestine conflict is crucial. Social media platforms have become pivotal in shaping public perception of the conflict (L. Abbas et al., 2022).

The potential of social media to influence behaviors can be dangerous, especially when considering the research finding of Bright (2018), who found that groups [that partake in online political activity], that sit at the extremes of the ideological scale are particularly likely to have lower patterns of interaction. In consequence, this might lead to radicalization, which can in turn hinder the potential for peaceful conflict resolution. Bearing that in mind, it is worth reiterating the importance of surveying online sentiments and interactions, as leaving them unchecked can have a tangible effect on human security in the long run. The study demonstrates that coordinated campaigns on social media substantially impact the emotional reactions and participatory behaviors of natural users, thereby intensifying polarization and shaping the nature of public discourse amid conflict situations (Fan et al., 2016);(Oliveira et al., 2022);(Gu et al., 2022);(Chen & Xia, 2024);(Dey et al., 2024).

Social media has been playing an important role in shaping the identity and behavioral patterns of many involved in the Israel-Palestine conflict (Chorev, 2019); (S. O. Abbas, 2024); (Ali et al., 2025). Excessive use of social media can lead to heightened aggression, potentially due to shared neural structures involved in both social media use and aggressive behaviors (Andreassen et al., 2016);(Ekinci et al., 2025);(Lin et al., 2025). For this reason, it is important to explain what is meant by *analyzing attitudes* and *sentiments* in this research. First of all, these two terms will be used interchangeably. The research goal of this paper is to examine the attitudes of Reddit users talking about the conflict. These general attitudes can translate to emotions, such as anger, hope, etc. It is therefore not the study of attitudes that Reddit users have towards either Israel or Palestine, but towards the conflict in general.

In the existing literature that deals with online sentiment analyses concerning the Israel-Palestine conflict, Reddit appears to be overlooked as a platform for analysis. For comparison, there are multiple studies performing sentiment analysis from Twitter data, which seems to be the most analyzed social media platform (AlAgha & Dahrooj, 2019);(Matalon et al., 2021); (Imtiaz et al., 2022). The lack of a robust body of literature focusing on Reddit especially when considering all its specificities can be understood as a gap in the literature. Moreover, as of January 2024, there is still very little Israel-Palestine literature that focuses on the period after the escalation of October 2023. This deficiency can be classified as a gap in the literature as well. Bearing that in mind, an important goal of this research paper is to fill these gaps.

The research question that I would like to pose for my research is how the attitudes of Reddit users discussing the Israel-Palestine conflict were changing throughout the first two months since the escalation of the conflict on 07.10.2023. This study might shed light on the emotional effect that the Israel-Hamas 2023 escalation might have had on online communities.

## 2. Method

During the process of researching the possible data sources for my study I came across an open-source, pre-collected data set on Kaggle (it is the world's leading, freely accessible platform for data scientists). The dataset of my choice, "Daily Public Opinion on Israel-Palestine War" by user Asaniczka contains comments posted on 14 various subreddits, either explicitly dedicated to

discussing the Israel-Palestine conflict, or that have it as a frequently recurring topic.[1] A very convenient feature of the data set is that it has been receiving daily updates since the first day of sampling (02.09.2023), and still is as of 11.01.2024. I accessed and downloaded the data set on 07.12.2023. On that day the data set contained 389229 entries, and its size was approximately 400MB.

The selected data set is suitable since it's composed of comments from subreddits, which are free from extreme bias and (to a large extent) non-partisan. I am accepting an assumption that the attitudes of people commenting on subreddits with very strong ideological alignments are rather unlikely to significantly change regardless of the developments following the escalation of the war. I want to observe the change of general attitudes within the subreddits that label themselves as civil discussion spaces. Nevertheless, I decided to allow r/Palestine into the sampled communities because it is one of the most important Israel-Palestine-related discussion spaces, and although it is not non-partisan, I would not label it as *extremely biased,* as e.g. r/freepalestine and r/FreePalestineMovement.

To evaluate my data I used the pandas tool within the Python programming language environment, through Jupyter Notebook. In the following paragraphs I shall explain in detail the steps I took to process my data. Firstly I downloaded my data set and opened it in Jupyter Notebook via pandas. The first step that I took was removing unnecessary information from my dataset. Since each entry in my data set contained over 20 data categories (or "columns", as viewed in pandas), I used the ".drop" method to hide from sight the categories irrelevant to this analysis. Those removed categories included: the comment ID, the author's name, whether the author has been verified, and more. The categories that remained were: the comment's net score, the name of the subreddit, the timestamp, the title of the post, and (most importantly) the text of the comment. After this, I converted the dataset's timestamp format to the "date time" regular format, and then I defined the new variable, that encompassed only those entries, whose timestamps were not older than 06.10.2023 (one day before the escalation of the conflict). After the completion of these initial steps, my pandas set was ready for further processing.

My next steps focused on working on the texts of the comments. To prepare the text value of each entry for sentiment analysis, I decided to perform the text "cleaning". I defined 2 simple functions: "to_lower," which utilizes the ".lower" method to turn all characters to lowercase, and "no_punctuation," which identifies the punctuation marks and removes them from the text. The next step I took to "clean" the text was to remove the so-called stopwords. Stopwords are such words, which do not carry enough value or meaning to be relevant in analysis. For example, articles, prepositions, and pronouns are frequently classified as stopwords. To remove stopwords, I defined a function that downloaded a library with predefined stopwords, tokenized each string (broke it up into smaller elements), and then removed stopwords from each checked element.

Having cleaned the comment texts in each entry, my dataset was ready for the sentiment analysis. Sentiment analysis has been defined by Hutto and Gilbert (2014) as analyzing people's opinions, sentiments, evaluations, attitudes, and emotions via the computational treatment of subjectivity in text. It allows for the assessment of the intensity of people's sentiments over time, which can give one an idea about whether the rhetoric on a given topic is heating up or cooling down in a given time. This kind of information may be of essence for researchers in multiple fields, like sociology or political science. The tool that I used to evaluate my data was VADER

[1] https://www.kaggle.com/datasets/asaniczka/reddit-on-israel-palestine-daily-updated

sentiment analyzer. I have chosen VADER (Valence Aware Dictionary for Sentiment Reasoning) as my main tool for this research, because it is especially well suited for analyzing text from the social media environments, due to its specifically adapted lexicon and two-dimensional approach. VADER is not only able to determine the *polarity* of an expression (positive-negative dichotomy), but also its *valence* (how strong is the expressed sentiment). In short, the algorithm assesses input expressions by referring to its base lexicon (essentially a list of words with a pre-defined sentiment score), but also by judging things like punctuation and capitalization within the expression (which often modify the strength of the statement). VADER also attempts to contextualize a word, to enhance its chances of accurate evaluation in situations of ambiguity. Besides that, VADER has shown a remarkable level of accuracy, comparable with scores of human raters. Lastly the tool is quick and computationally economical (Hutto & Gilbert, 2014)

VADER sentiment analyzer awards each entry a score in three categories: positive, neutral, negative. Having done that, it calculates one compound score for each comment, which becomes its overall sentiment "grade". The compound sentiment score can be translated to the attitude of the comment's author, with low score translating to negative, and high score translating to positive emotions.

Having obtained the compound score for each Reddit comment, I came up with two approaches to analyze the results.

a) The first approach was to segregate all comments into "sentiment category groups", depending on their compound sentiment score, and compare their ratios over the research timeframe. To do that, I established three categories with rigid boundaries: Negative, Neutral and Positive, where the conditions of admission were: less than -0.05 for negative; more than 0.05 for positive; and between -0.05 and 0.05 for neutral.[2] Each Reddit comment received one of these three labels, depending on its compound sentiment score. Since I wanted to research the potential change of sentiments over time, I decided to calculate, whether the "sentiment category groups" ratio was changing. I counted the total amount of entries corresponding to each unique timestamp (each date), and then I calculated the percentage share of each "sentiment category group" within that timestamp. The output of my request was a list of all unique dates within the time scope of my research (06.10 – 07.12.2023) and their corresponding percentage shares each of the three sentiment categories. The last step was to create a stacked bar graph as a visual representation of the findings of my analysis.
b) The second approach was relatively simpler. Instead of classifying each comment as either negative, neutral or positive, and work with those categories, I calculated the mean compound score for each date. Having done so, I created a line graph for better visualization.

[2] The use of this range for distinguishing the negative, neutral and positive categories has precedence in literature dealing with VADER sentiment analyzer, e.g. (Hutto & Gilbert, 2014).

## 3. Results and Discussion

The key outputs of sentiment analysis are presented and visualized below:

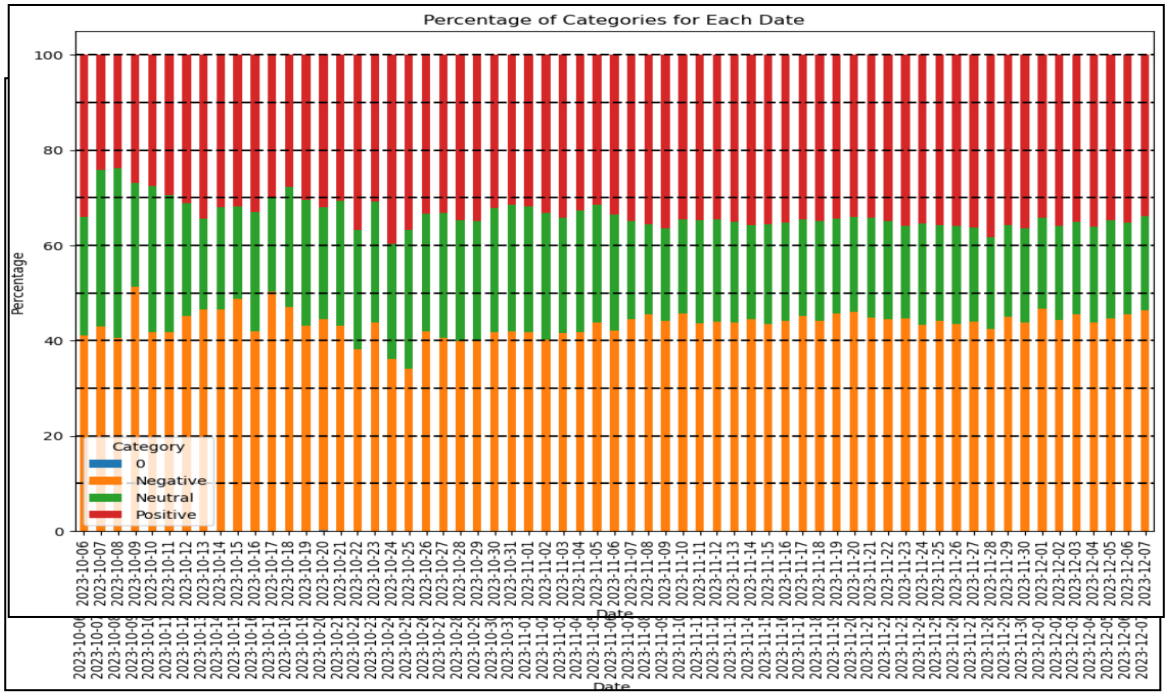


**Figure 1**. Stacked Bar Chart of Percentage Shares of Comments Belonging to a Given Sentiment Category by Date.

Over the time of the entire research time-frame, the ratios of the three distinguished comment sentiment categories did not change significantly. The most volatile period of the research time-frame was the three initial weeks (from 06.10.2023 onwards). Throughout the entire 2 months of the sampling period (except one day), the negative sentiment category was the largest. The percentage share of comments in that category oscillated between 35% and 50% in the initial three weeks and stabilized around 45% towards the end of the research time-frame.

| Category<br>date_only | Negative | Neutral | Positive | Category<br>date_only | Negative | Neutral | Positive |
|---|---|---|---|---|---|---|---|
| 2023-10-06 | 41.085271 | 24.806202 | 34.108527 | 2023-11-07 | 44.539892 | 20.581313 | 34.878795 |
| 2023-10-07 | 42.968750 | 32.812500 | 24.218750 | 2023-11-08 | 45.590778 | 18.858790 | 35.550432 |
| 2023-10-08 | 40.614334 | 35.494881 | 23.890785 | 2023-11-09 | 44.137050 | 19.493509 | 36.369440 |
| 2023-10-09 | 51.298701 | 21.861472 | 26.839827 | 2023-11-10 | 45.736773 | 19.709226 | 34.532138 |
| 2023-10-10 | 41.711230 | 30.659537 | 27.629234 | 2023-11-11 | 43.618421 | 21.710526 | 34.660088 |
| 2023-10-11 | 41.795666 | 28.792570 | 29.411765 | 2023-11-12 | 43.966803 | 21.549795 | 34.483402 |
| 2023-10-12 | 45.188285 | 23.640167 | 31.171548 | 2023-11-13 | 43.850824 | 21.127493 | 35.021683 |
| 2023-10-13 | 46.556474 | 19.008264 | 34.435262 | 2023-11-14 | 44.437007 | 19.849769 | 35.705786 |
| 2023-10-14 | 46.540881 | 21.383648 | 32.075472 | 2023-11-15 | 43.513162 | 20.921319 | 35.565519 |
| 2023-10-15 | 48.765432 | 19.444444 | 31.790123 | 2023-11-16 | 44.095117 | 20.651133 | 35.253750 |
| 2023-10-16 | 41.916168 | 25.149701 | 32.934132 | 2023-11-17 | 45.204530 | 20.298898 | 34.496572 |
| 2023-10-17 | 50.201613 | 19.858871 | 29.939516 | 2023-11-18 | 44.154924 | 20.995041 | 34.850035 |
| 2023-10-18 | 47.093451 | 25.091979 | 27.814570 | 2023-11-19 | 45.709606 | 19.860429 | 34.415723 |
| 2023-10-19 | 43.039126 | 26.478617 | 30.482257 | 2023-11-20 | 45.961095 | 20.013188 | 34.025717 |
| 2023-10-20 | 44.357367 | 23.510972 | 31.974922 | 2023-11-21 | 44.884726 | 20.821326 | 34.293948 |
| 2023-10-21 | 43.041607 | 26.398852 | 30.559541 | 2023-11-22 | 44.454303 | 20.703934 | 34.841763 |
| 2023-10-22 | 38.161209 | 25.062972 | 36.775819 | 2023-11-23 | 44.582043 | 19.483292 | 35.934664 |
| 2023-10-23 | 43.770673 | 25.358324 | 30.871003 | 2023-11-24 | 43.214286 | 21.447876 | 35.337838 |
| 2023-10-24 | 36.070381 | 24.340176 | 39.589443 | 2023-11-25 | 44.208618 | 20.008532 | 35.772184 |
| 2023-10-25 | 34.042553 | 29.255319 | 36.702128 | 2023-11-26 | 43.413517 | 20.706670 | 35.871002 |
| 2023-10-26 | 41.935484 | 24.731183 | 33.333333 | 2023-11-27 | 43.902184 | 19.834883 | 36.262932 |
| 2023-10-27 | 40.564263 | 26.206897 | 33.228840 | 2023-11-28 | 42.404349 | 19.263514 | 38.332137 |
| 2023-10-28 | 39.848101 | 25.417722 | 34.734177 | 2023-11-29 | 44.935113 | 19.241901 | 35.822986 |
| 2023-10-29 | 40.100671 | 24.944072 | 34.955257 | 2023-11-30 | 43.877551 | 19.694868 | 36.427581 |
| 2023-10-30 | 41.766697 | 26.069560 | 32.163743 | 2023-12-01 | 46.653510 | 19.143642 | 34.202849 |
| 2023-10-31 | 41.858910 | 26.713474 | 31.427616 | 2023-12-02 | 44.288783 | 19.744093 | 35.967124 |
| 2023-11-01 | 41.750948 | 26.485461 | 31.763590 | 2023-12-03 | 45.493230 | 19.371373 | 35.135397 |
| 2023-11-02 | 40.178344 | 26.649682 | 33.171975 | 2023-12-04 | 43.872881 | 19.966102 | 36.152542 |
| 2023-11-03 | 41.669177 | 24.133775 | 34.197047 | 2023-12-05 | 44.708569 | 20.573556 | 34.717875 |
| 2023-11-04 | 41.691713 | 25.590382 | 32.717905 | 2023-12-06 | 45.488097 | 19.237867 | 35.264809 |
| 2023-11-05 | 43.771930 | 24.795322 | 31.432749 | 2023-12-07 | 46.420848 | 19.766436 | 33.801903 |
| 2023-11-06 | 42.116538 | 24.271637 | 33.611825 | | | | |

**Figure 2**. Percentage Shares of Comments Belonging to a Given Sentiment Category by Date

The Figure above confirms the stabilization of the percentages in the second half of the research timeframe. The percentage shares of comments expressing negative attitudes oscillated around approximately 45% in that period, and the shares of neutral and positive comments oscillated around 20% and 35%, respectively.

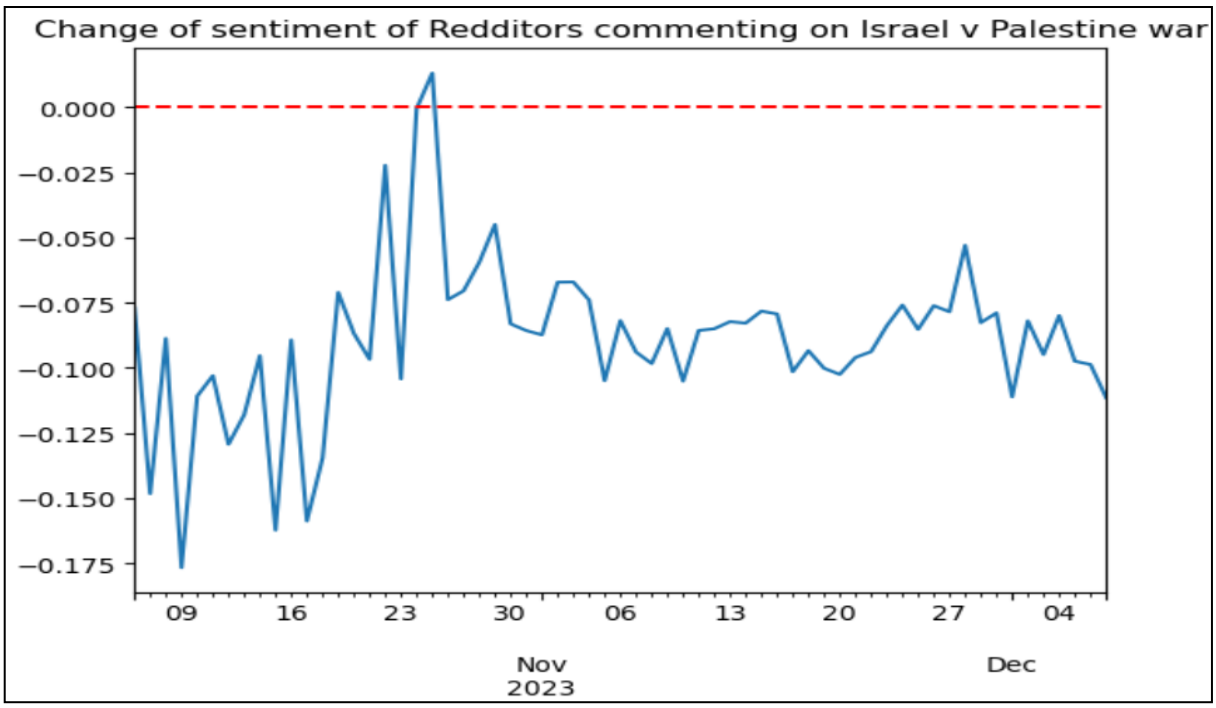


**Figure 3**. Line Chart of Mean Compound Sentiment Scores by Date

Figure 3 provides a clear visualization of mean compound sentiment scores for each day from 06.10.2023 to 07.12.2023. The sentiment scores in the early weeks since the escalation shows volatility, which corresponds with Figures 1 and 2. What's more, the position of the curve below the (y = 0) throughout the vast majority of the days within the research time frame supports the findings of Figures 1 and 2, that the negative sentiment category was the largest. It has to be stressed, however, that the large volatility of the sentiment scores in the early weeks since the escalation might be a consequence of small sample sizes from that period, as explained in the limitations section.

The results of the sentiment analysis performed in this study provide a solid ground for answering the research question of how the attitudes of Reddit users were changing throughout the first two months since the escalation of the Israel-Palestine conflict on 07.10.2023. First of all, the analyzed data suggests that there may be a correlation between the short-run mean sentiment score fluctuations and widely publicized events on the ground in the Israel-Hamas war.

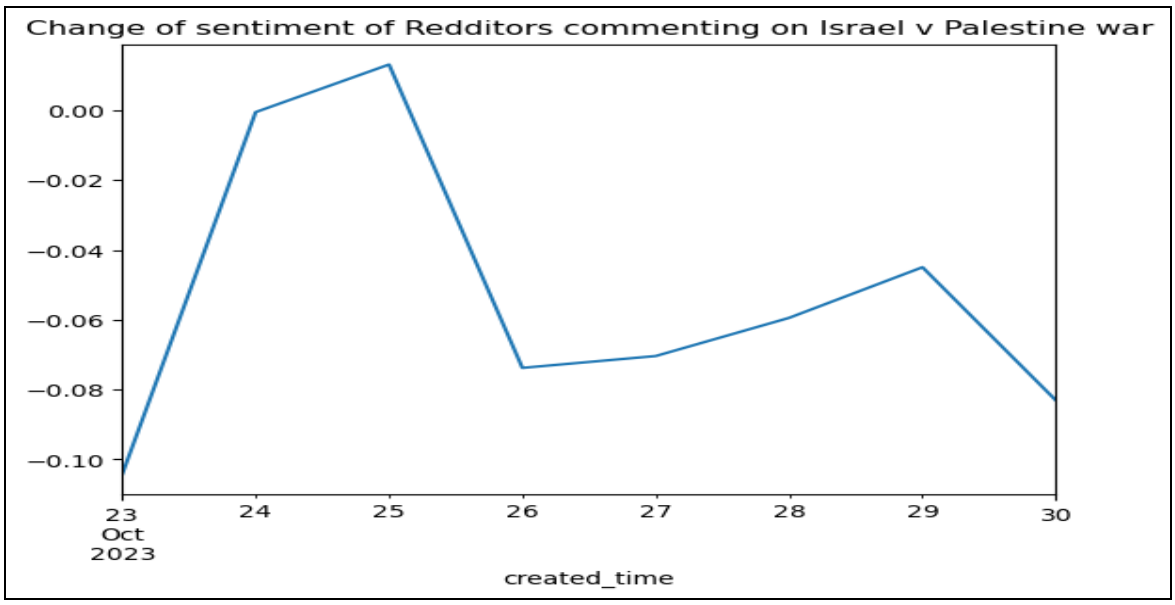


**Figure 4**. Line Chart of Mean Compound Sentiment Scores between 23.10.2023 and 30.10.2023.

The graph above is a snippet of Figure 3, which only shows the data from between 23rd and 30th October 2023. Throughout the first 4 days of that period, there was a sharp surge in the mean sentiment score, followed by a similarly rapid drop, which together formed the most exceptional short-term fluctuation of the sentiment score in the entire study. This appears to be correlated to the events in Gaza, that occurred in that period. For context on October 21st, it had been announced that some aid trucks were allowed through the Rafah border crossing from Egypt into Gaza. On October 23rd Hamas released two elderly hostages on humanitarian and poor health grounds. These two consecutive pieces of news, that can objectively be labeled as good, might have evoked sentiments of hope and positivity in the Reddit community. However, around October 26th the news broke out that Israeli forces had begun their biggest raid into Gaza so far, with tanks and infantry hitting infrastructure (Reuters, 2023). As objectively negative news, it might have induced negative sentiments of anger and hopelessness in the Reddit comments, which led to the mean sentiment score drop.

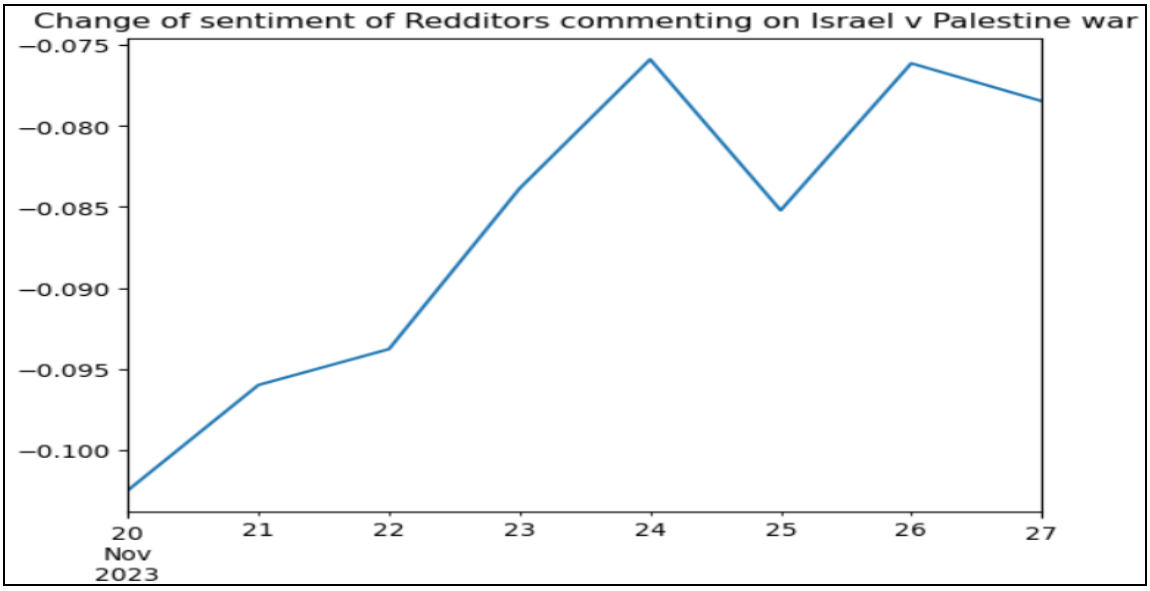


**Figure 5**. Line Chart of Mean Compound Sentiment Scores between 20.11.2023 and 27.11.2023

Another example of a possible correlation between the events on the ground in Gaza and the mean sentiment scores of Reddit comments is observable in the period between the 20th and 27th of November. This period also witnessed a consecutive streak of objectively good news, such as the announcement of a four-day pause in fighting on the 21st of November. In the following days, both sides negotiated the hostage exchange, which came into effect on November 24th (Reuters, 2023).

An interesting finding of the data analysis, easily observable in Figure 1 is the stable ratio of sentiment categories throughout the second part of the research timeframe. That stability can be translated to a lack of volatility of sentiments, which might result from the smaller emotional effect of the publicized events of the war on online communities. A plausible hypothesis for explaining this could be the *media fatigue* effect at play. (Zhang et al., 2022) define this phenomenon as the indifference to the news caused by overburdening of the people with information. Researching this, and other possible causes of this lack of volatility is the key recommendation of this paper for further research.

## 4. Conclusion

There are limitations to my research worth stressing. First of all the distribution of comments across timestamps was not equal in the dataset used in this research, as shown in Figure 6.

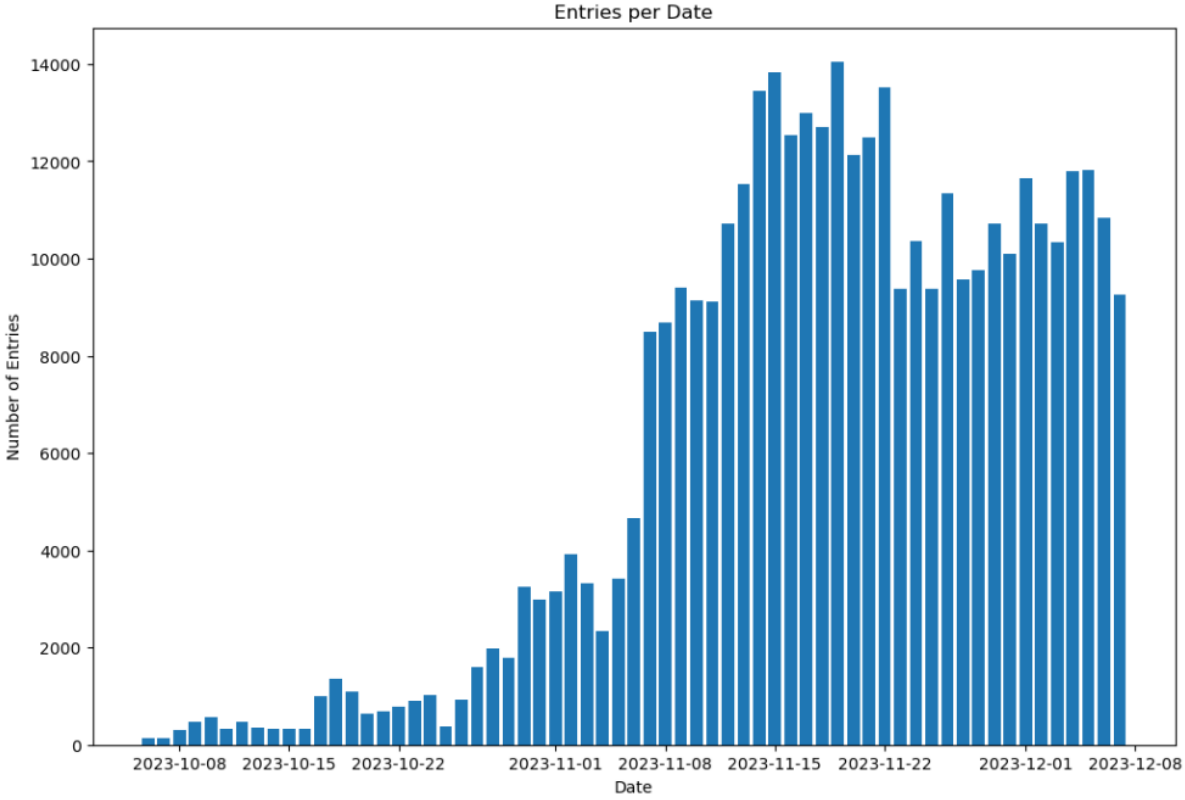


**Figure 6**. Distribution of Data Entries by Date

A small number of entries corresponding to a timestamp makes its sentiment score less reliable and more prone to showing a distorted result. This issue is especially noteworthy in this study, because the disparity in the amount of entries is significant across the timestamps from the

beginning and the end of the research timeframe. This issue could be the cause of a high volatility of scores in the earlier timestamps.

The second important limitation comes from the intrinsic limitations of the VADER sentiment analyzer. Despite of its generally impressive performance, the tool is not always capable of assessing all expressions correctly. Due to its dependence on a pre-defined lexicon, the tool might have problems with evaluating relatively new slang words, as well as misspelled words, that would nevertheless be readable for a human. Expressions which contain sarcasm or irony can also be problematic at times. An example of this can be seen in Figure 7, where VADER failed to detect sarcasm in an expression and erroneously awarded it a very positive score instead.

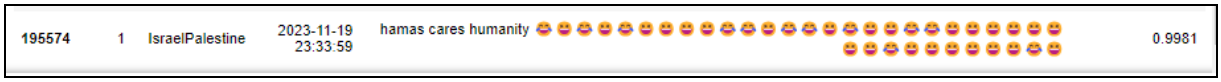


**Figure 7**. An Incorrectly Evaluated Comment from the Research Dataset

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