**What are the Sentimental Dynamics and Emerging Topics in Contrasting Movie Genres Barbie and Oppenheimer?**

![A person with a cigarette in her mouth and a person in a hat

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Figure 1: *Barbie versus Oppenheimer*: The war for summer 2023 ([Pavlin](https://thevarsity.ca/author/alexpavlin/), 2023: online)

**1. Introduction**

The analysis of audience sentiments and preferences in movie reviews holds substantial importance in contemporary film studies. This essay explores a comparative study of sentimental analysis and topic modelling, focusing on two diverse movies: Greta Gerwig’s Barbie and Christopher Nolan’s Oppenheimer. The selection of these movies for comparative analysis is rooted in their contrasting themes and individual popularity, presenting a compelling exploration of audience perceptions and textual analysis.

The cinematic landscape, a kaleidoscope of diverse narratives and genres, converges this year with the 2024 Golden Globe Awards (Lang, 2023) celebrating an intriguing dichotomy: Barbie animations and Oppenheimer documentaries. Both genres, seemingly poles apart in themes, storytelling, and intended audiences, have garnered significant recognition with nominations at this prestigious event. The juxtaposition of Barbie celebrated for its animated tales of empowerment and fun, and Oppenheimer, renowned for its sobering exploration of history and critical societal issues, at this esteemed ceremony, signifies a striking contrast in cinematic offerings. This essay seeks to unravel the intricacies of these contrasting movie genres by dissecting their sentimental dynamics, exploring emerging themes, and gleaning valuable lessons from the data sourced from the IMDB reviews.

**2. Related Works**

Several studies have explored sentiment analysis and topic modelling methods for movie reviews. Putra et al. (2023) conducted a sentimental analysis of the Oppenheimer film using audience reviews from IMDb. Su (2022) conducted sentiment analysis on two movie reviews from IMDB, specifically for "The Lord of the Rings 1" and "The Lord of the Rings 3". TextBlob was used to estimate the sentiment trends across the two movies, and an SVM model was employed to predict the accuracy of the sentiments. This work almost converges to what this essay. The study found an accuracy of 85.2%. Das et al. (2021) did an exhaustive comparison among the seven-sentiment analyser tool including TextBlob and Vader which are executed on four different web-scraped datasets and the result analysis shows that Vader performed better as it reduces neutral by converting them to the positive sentiment which is slightly different observation based on the results received using the IMDB movie dataset. Selvakumar and Lakshmanan (2022) proposed a sentiment classification method that was more accurate and efficient as it considered the contextual relationship of the entire sequence of words. They used the BERT model to analyse the IMDB movie reviews and the Amazon fine food reviews, achieving a remarkable accuracy of 94%.

**3. Data**

The study conducted a comparative analysis of the movies "Barbie" and "Oppenheimer" using various reviews, ratings, and textual content. A Python module called "Scrapset" was used to scrape data from IMDB. The data was obtained from Kaggle, which is a reliable and trusted platform for datasets and provides easy accessibility to them. The study used secondary data instead of primary data like surveys as it is already available online and is less prone to ethical issues. Kaggle is one such prominent data repository that offers optimal accessibility to datasets in various formats, making it convenient for users to download, explore, and analyse data. The review datasets for Barbie and Oppenheimer respectively contained 797 unique reviews and 2036 distinct reviews, and as the data is open source, the chances of any ethical concerns arising are eliminated.

**4. Methodologies**

This essay aims to provide a better understanding of customers' attitudes towards the Barbie and Oppenheimer movie genres. To carry out this analysis, various methodologies such as sentiment analysis using TextBlob and Vader, and topic modelling using LDA, were utilized. The comparative evaluation showed subtle differences in sentiment interpretation between TextBlob and Vader, with TextBlob being preferred due to its better understanding of contextual nuances and sentiments. The following approaches were used to tackle the sentiments:

* Data pre-processing
* Sentimental analysis using Text Blob and Vader
* Topic Modelling using Latent Dirichlet Allocation (LDA)

**4.1. Data pre-processing**

The process involves converting text to lowercase, eliminating punctuation, tokenizing into words, removing the standard English stop words list already available in NLTK, and customizing the stop words. Additionally, stemming and lemmatization techniques were employed to derive the stemmed and lemmatized tokens. These steps aimed to cleanse the textual data, to 'Stemmed\_Text' and 'Lemmatized\_Text' for both datasets, housing the processed tokens.

**4.2. Sentimental analysis using Text Blob and Vader**

**4.2.1.** TextBlob- It is an open-source Python library based on NLTK. Polarity is a float value between [-1, 1] where 0 indicates a neutral sentiment, 1 indicates positive and -1 indicates negative sentiment.

**4.2.2.** VADER- Valence Aware Dictionary and sentiment Reasoner is another Python library that can be used for lexicon-based sentiment analysis. VADER breaks down the sentiment intensity score into positive, negative and neutral components, these are further normalised to be within the range [-1, 1] as a compound score.

**4.2.3.** Vader or TextBlob performed better in IMDB reviews dataset:

Firstly, utilizing TextBlob, sentiment polarity scores are computed for each review in both datasets. Subsequently, VADER sentiment analysis is applied to determine sentiment scores for reviews in both datasets. Based on the sentiment analysis results obtained, TextBlob appears to offer a more conservative and nuanced sentiment analysis compared to VADER. In this scenario, TextBlob exhibited closer proximity to neutral sentiment scores, potentially indicating a more balanced assessment of sentiment polarity in the analysed text data. Figure 2 depicts the comparison.

**4.3.** **Topic modelling using LDA** (Latent Dirichlet Allocation)

LDA was used to identify latent topics within the reviews. This involved extracting meaningful topics or themes present in the textual data, providing insights into the prevalent subjects discussed in the reviews.

**5. Results**

**5.1. Hypothesis:**

* Null Hypothesis (H₀): There is no notable discrepancy or misinterpretation in the ratings and sentiment scores for reviews rated as 1.

To prove the hypothesis, the numerical rating is plotted against the mean of the sentimental score in different rating categories for both movies. It seems that some reviewers who rated with a 1 might have intended a higher rating, possibly a 10, as the polarity of reviewers with higher counts coincides with higher ratings, although slightly less. Figure 3 represents an almost positive correlation between the ratings and the text sentiments except for rating 1. Figure 2 illustrates that both movies are more liked than disliked on a scale of 2 to 9.

**5.2. Observations from the Barbie Dataset**

The sentiment analysis of Barbie reviews unveiled a prevalent positivity in audience sentiments. From Figure 4, the key topics that emerged from the most positive reviews encompass the fun-filled perfect one-time watch movie that portrays both women and men in a way that gives a good message to society. Those people who wrote the most negative reviews wrote that the movie is giving negative impact on kids. Some people even felt that men leaving work was unacceptable.

**5.3. Observations from Oppenheimer Dataset**

Contrastingly, the analysis of the Oppenheimer dataset revealed a more varied sentiment distribution, striking a balance between positive and negative sentiments. From Figure 6, it is evident that the most positive reviews talk about the discussion revolved around historical accuracy, bomb, character depth, and cinematographic elements whereas the most negatively reviewed people felt that the movie was confusing and hard to make out Oppenheimer’s emotions.

**5.4. Compare and contrast both movies with the popular critic's reviews**.

Common positive sentiments around both movies are their brilliant casting and great performances by Ryan, Margot and Cillian Murphy. From a directorial perspective, people tend to appreciate Nolan and Greta for their work. However, a common negative reception among reviewers was that both movies were boring and a waste of time. I have taken the critic's reviews of both movies from The Guardian newspaper site. Based on the critics Kermode (2023) for Barbie and Bradshaw (2023) for Oppenheimer cited that the Oppenheimer movie leans towards historical significance, ethical dilemmas, and Nolan's directorial choices, while the Barbie review emphasizes the film's playful, feminist messages, and gender roles. Both reviews commend the performances of the lead actors. This almost matches our observations.

A comparison of a graph

Description automatically generated

Figure 2: Sentiment scores using Vader and TextBlob

A comparison of bar graph

Description automatically generated

Figure 3: Rating frequency distribution

A screenshot of a graph

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Figure 4: Correlation of numerical ratings with text-based sentiment score

A green bar graph with white text

Description automatically generated

A graph of different sizes and numbers

Description automatically generated with medium confidence

Figure 5: Barbie: Topics discussed in the most positive (green) and most negative reviews (red).

A green and white graph

Description automatically generated

A graph of red bars

Description automatically generated with medium confidence

Figure 6: Oppenheimer: Topics discussed in the most positive (green) and most negative reviews (red)

**6. Conclusion**

The comparative analysis between Barbie and Oppenheimer movie datasets illuminates the importance of understanding audience sentiments and preferences in film analysis. This exploration underscores the diversity of viewpoints within movie audiences and highlights the necessity for nuanced analytical methodologies to extract comprehensive insights from movie reviews. Sentimental analysis using TextBlob and Vader showcased subtle differences in sentiment interpretation, with TextBlob offering a more nuanced evaluation. Customer sentiments are more positively aligned with both movies than their negative aspects. Additionally, topic modelling using LDA revealed distinct themes in audience discussions for each movie, from positive portrayals of the soles of men and women in Barbie to varied sentiments on historical accuracy and confusion in Oppenheimer. This comparative study underscores the multifaceted nature of audience reactions and the need for in-depth, context-aware analysis in movie critique and understanding. To elevate the analysis to a future level, I would also prefer to develop predictive models that forecast audience sentiments and preferences for upcoming movies on these themes. I am also interested in delving more into keyword-specific analysis like ‘Feminism’ is described positively or negatively based on the reviewer's gender.

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