

# Textual Analysis of Movie Reviews Over Time and What Influences if Critics Are Positive or Negative

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## Research Question

What can VADER sentiment analysis and word frequency counts tell us about how movie critics have changed their language from the early 1900s to the early 2000s?

## Introduction

Films have been reviewed since the early 1900s, a few years after the first commercial movie release in 1895. At first, the only reviews others read were from professional critics, however as time has passed now people consume more and more reviews that are written by any person that wishes to share their opinion, whether they get paid to do that or not.

Not only have the nature of reviews themselves changed over time but also that of films. The development of films with sound, color, and the creation of digital media. All of these have had dramatic changes to the movie world.

I will look to explore how these changes have affected different aspects of film reviews from the dataset I have.

## Dataset

For this study, I used a set of 27,948 movie reviews that are all HTML files. This set of files was put together by Natural Language Processing researchers at Cornell University.

## Methodology

With the set of movie review files all being HTML, I used BeautifulSoup and Regex to create my uncleaned data set. This created a set of years and raw uncleaned reviews. So then I used TextHero to clean the reviews.

The next step was to apply the VADER Sentiment Analysis to each review. I chose VADER analysis as it is capable of scoring the overall sentiment of a string of text from -1 to 1 so I could compare how positive or negative each review was on this scale.

After this, I grouped the data by year using Pandas taking the average sentiment of each year and concatenating all the clean reviews for each year together. If a year had less than 20 reviews I dropped that year entirely. Then I performed some general Exploratory Data Analysis.

From the EDA I learned which specific years I wanted to analyze further and then, using NLTK, performed frequency analysis on all the reviews from that year as a whole.

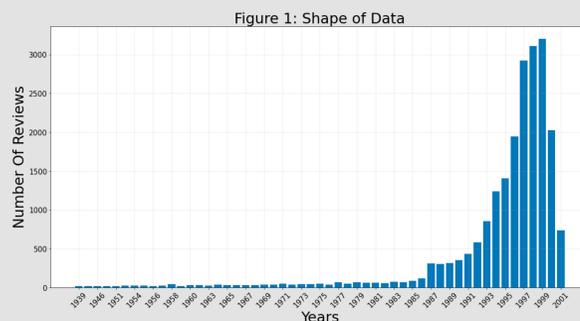


Figure 1 shows the overall shape of the data. All of this was done using Python in a Google Colab notebook.

## Results

The analysis revealed that, in general, over the history of film reviews the overall sentiment of them decreased.

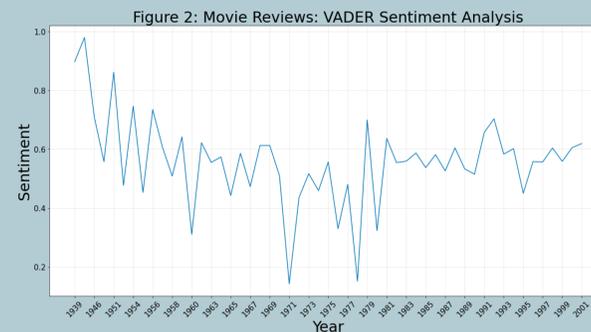


Figure 2 shows the overall negative trend of the sentiment of film reviews over time. I believe this is due to movies, and movie reviews becoming more common so people begin to be less and less impressed with movies and there are more differing opinions being heard. From this, I wanted to take a deeper look into the drop between 1992 and 1995 as the data seems to be plateauing before and after this.

Pairs	Frequency
(horror, film)	101
(look, like)	100
(special, effect)	85
(new, york)	85
(cool, world)	83
(malcolm, x)	79
(basic, instinct)	76
(even, though)	75
(rated, r)	73
(jackie, chan)	70

Table 1: 1992 Pairs

Pairs	Frequency
(year, old)	201
(new, york)	182
(motion, picture)	172
(look, like)	168
(bad, guy)	161
(die, hard)	152
(special, effect)	137
(mine, meant)	133
(meant, reflect)	133
(reflect, employer)	133

Table 2: 1995 Pairs

The tables above show the most common word pairs from the two years of interest, 1992 being the year of higher average sentiment. Interestingly, there are more specific word pairs such as 'Malcolm X' or 'horror film'. It shows that a lot of critics wrote about these movies or genres and they were generally well-liked. On the other hand, 1995 does not have these specifics where many critics all talked positively about similar things.

## Conclusion

Sentiment in movie reviews was on a downward trend from around 1940 until 1982 and has seemingly flattened since then.

Looking at specific years allowed me to learn that one factor that can influence the sentiment for a year is having many specific films or film genres that get a lot of critics talking about them in a positive way. This rather than reviews being evenly spread between all different movies will, on average, have critics be more positive in that year.

## Future Research

It would be very interesting to be able to continue this analysis with more current data. Originally I was going to use the IMDb API which has access to movie reviews, however, due to technical issues I was not able to pursue that route. For me, the more recent data would have been more interesting as it would be in my lifetime and I could connect to events I lived through instead of simply historical events I have read about. In addition, we could see what effect streaming services have had on this trend.

## Acknowledgments

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