Recency Bias Exists in Animated Disney Movie Reviews

DS 4002

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Project Details

- **Motivation:** Understand if and how the time from the release date of a movie affects its review sentiments to help explain the phenomenon of “recency bias.”
- **Research Question:** Are reviews for animated Disney movies (released in the 2000s-2010s) more positive within the first year of the movie’s release compared to the years following due to the concept of recency bias?
- **Hypothesis:** The average sentiment score for a movie’s reviews within one year of its release will be higher than the average sentiment score of the years following, indicating the presence of recency bias.
- **Modeling Approach:** T-test, regression, and confidence intervals
- **Goal:** Investigate whether the average sentiments for animated Disney movies are greater or lower for reviews published soon after a movie’s release versus a year or more after its release.

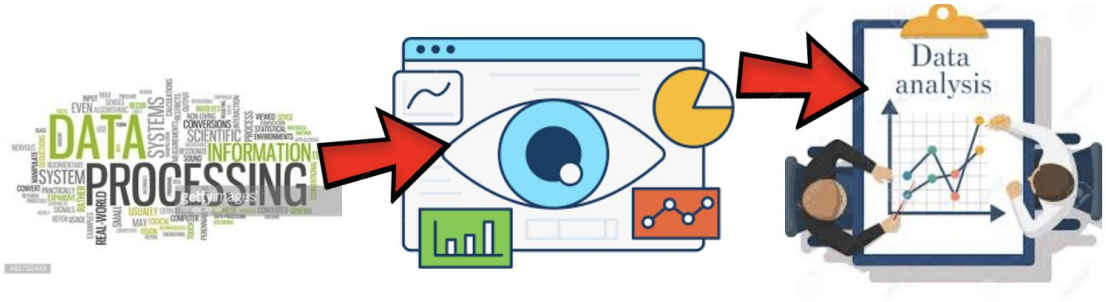
Data Acquisition & Explanation

Variable Name	Description	Potential Responses
rating	Integer from 0-10 representing the score the user gave the movie, with 0 representing the worst score and 10 the best	10, 8
helpful	Integer representing how many other users found the review helpful	79, 396
total	Integer representing the amount of total reactions to the review. The difference between total and helpful is the amount of users who did not find the review helpful.	96, 31
date	Date type data in YYYY-MM-DD format representing the date in which the review was posted by the user	2019-02-23, 2008-07-01
title	Text data representing the title of the user's review	Pixar does it again!, I cried like a baby.
review	Text data representing the user's movie review	I watched the movie long time ago, and I've just rewatched it today. For kids it will be…"
UniqueID	Text data representing the name of the movie followed by release year	Inside Out 2015, WALL-E 2008
release_date	Date type data in YYYY-MM-DD format representing the movie's release date	2015-06-19, 2008-06-27
recent	Boolean variable representing whether or not the review was posted within a year of the movie's release date. 0 if false, 1 if true	0, 1
negative	Negative sentiment score from the VADER package	0.141, 0.069
positive	Positive sentiment score from the VADER package	0.184, 0.128
compound	Compound sentiment score (positive + negative) from the VADER package	0.9910, -0.8791

- Acquired via IEEE DataPort [1] no licensing or ethical concerns
- The dataset contained 1,150 movies reviews all in separate csv files and was in text format
- The individual csv files for 23 animated Disney movies released in 2000s and 2010s were selected and appended using Python to create our dataset
- We chose this method as our dataset had over 15,000 rows and we had plenty of data to analyze
- A few null rows were removed using Python

Analysis Plan & Justification

- The first step was to obtain and process the data so that it would be ready for analysis
- After processing, the group did exploratory data analysis (EDA) on variables where trends were expected and on variables that seemed interesting
- During EDA, the group was able to find information such as the number of reviews for each movie and how each movie's average sentiment score differed for recent and non-recent reviews through data visualizations created
- After EDA, the group conducted formal analysis on the data



Tricky Analysis Decision

- At first, the group contemplated using the reviews for just a singular movie or TV series

- Ultimately the group decided to analyze multiple movies spanning over a decade to have more data and variety to work with

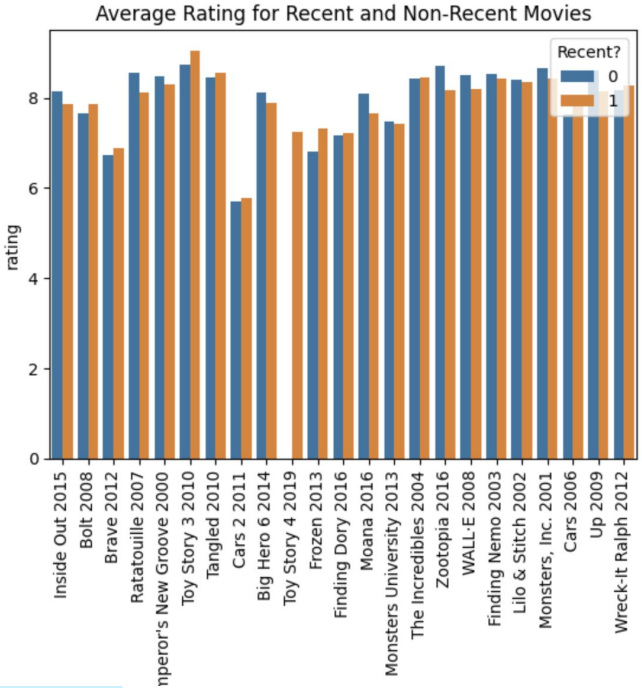
- Once the group had the data, it was difficult to decide whether or not to run analysis on each individual movie separately or take an average of all
    - Decided on taking the average of sentiments for all movies' reviews, splitting between recent and non recent reviews to make the analysis more understandable and clear
    - Results now explain what someone may expect for any future animated Disney movie release, rather than just a specific movie

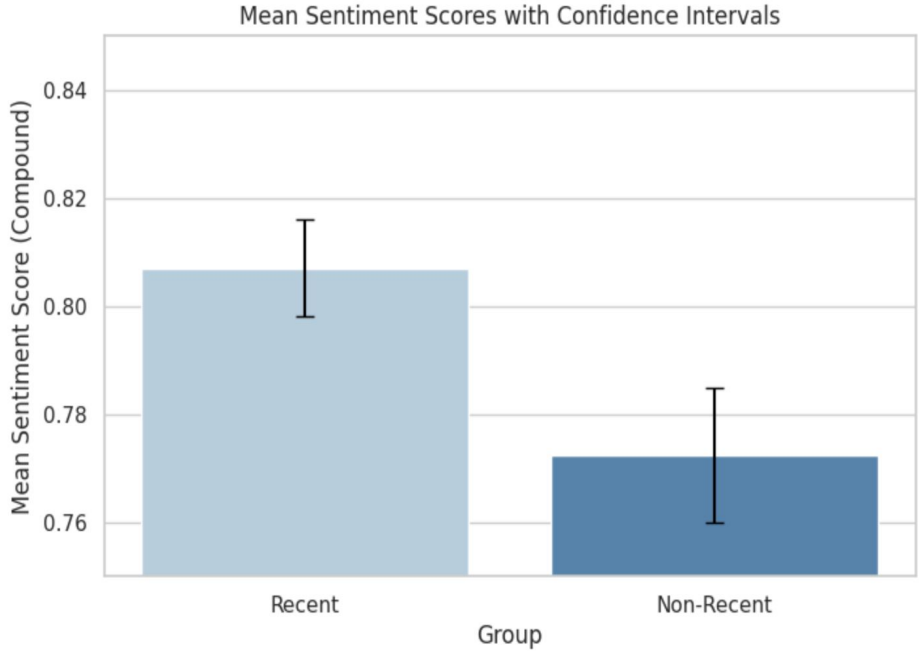
Bias & Uncertainty Validation

- Bias was minimized in our dataset as we initially were going to pick a select few years to gather movies from, however we expanded to cover a 20 year period
- There was concern for not having enough data initially to prove our conclusions if we analyzed on a per-movie basis, however after expanding the scope of our dataset and deciding to average recent and non-recent movies together we had enough data to eliminate bias
- Utilizing a confidence interval to help determine our conclusion helped to eliminate any uncertainty in this analysis
- Time lag uncertainty was something we assumed to be uncommon, as reviewers were thought to have likely completed the review soon after they watched the movie
- Our analysis also corrects for recency bias as this was the main goal of our study

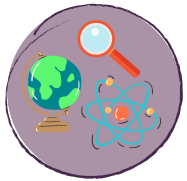
Results & Conclusion

- A slight variation in sentiment scores was found, with recent movies receiving higher sentiment scores from users, on average; The confidence intervals do not overlap
- T test indicated that our hypothesis was statistically significant (0.00000392 < 0.05)
- Regression results indicated that the recency of the movie's release had a very small effect on the sentiment score (coefficient on the recent variable: 0.0346)





Next Steps



New Lines of Exploration:

- Fixed Effects model - would allow us to see if there is a difference between recency bias in 2000s vs 2010s
- Group by genre when conducting analysis
- Expansion into movie industry as a whole

Improvements:

- Use research specific sentiment analysis package rather than VADER
- Export modern reviews from IMDB as the data only goes through 2019
- Conduct the same analysis for each individual movie for more precision

New Questions:

- How does recency bias change from the 2000s to 2010s in movie reviews?
- Is there a significant difference in the sentiment scores of movie reviews depending on genre?

References

[1] Aditya Pal, Abhilash Barigidad, Abhijit Mustafi, August 2, 2020, "IMDb Movie Reviews Dataset", IEEE Dataport, doi: https://dx.doi.org/10.21227/zm1y-b270.

[2] “Fighting Recency Bias,” *CAPTRUST*, Nov. 14, 2023. https://www.captrust.com/resources/fighting-recency-bias/ (accessed Sep. 11, 2024).

[3] “Welcome to VaderSentiment’s documentation! — VaderSentiment 3.3.1 documentation,” *vadersentiment.readthedocs.io*. https://vadersentiment.readthedocs.io/en/latest/ (accessed Sep. 11, 2024).

Link to resources (GitHub repository): https://github.com/jillianhaig/Project1_DS4002/tree/main

Closing

Recency bias seems to hold in this scenario, as movie reviews published within a year of a film's release tended to have higher or more positive sentiments (on average) than those for reviews published over a year after a film's release