

# Power and Agency in Film Scripts and Reviews

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## Abstract

Language surrounding an individual affects our perception of that individual. The connotation frames of power and agency provide a lens in which to examine the way that actions reflect upon their subjects and objects. These connotation frames were introduced in Sap et al. (2017) and applied to modern movie scripts to measure the subtle, but prevalent, gender bias in the portrayal of modern film characters. I replicate and extend this work to the more meta-referential domain of movie reviews. I then compare the results of power and agency frames applied to films and reviews of the same film.

## 1 Introduction

A person's perception of a stranger presented on-screen or in a text will necessarily be affected by the language used to describe them and the actions that they take. The aggregate of these perceptions can influence an individual's internal representation of gender (Behm-Morawitz and Mastro, 2008). A person's actions can be expressed with varying degrees of power and agency, depending on the specific verbs used. Reader or viewer perceptions, in turn, are shaped by the connotations of these verbs. These assumptions can have negative consequences if they reinforce negative stereotypes (Walton and Spencer, 2009).

Sap et al. (2017) introduced formalized power and agency connotation frames relying on hand-classified verbs and dependency parsing as an extension to the connotation frame lexicon of Rashkin et al. (2016). They demonstrated the application of these connotation frames to a set of about 1000 movie scripts, allowing for a more nuanced look at gender bias in various films. Their interactive website displays their findings: <https://homes.cs.washington.edu/~msap/movie-bias>. In particu-

lar, they note that high-agency women are relatively rare in modern films.

## 2 Original Work

### 2.1 Connotation Frames

In the original work, three AMT crowdworkers annotated a set of verbs to assess two things: the power differential they suggest between the subject, or agent, and object, or theme, and the agency afforded the agent. Let's examine an example. In the sentence "Sam calls Alex," the agent would be Sam, the theme would be Alex, and the verb in question would be to call. The verb call was shown to be have high agency and the power favored the theme, that is to say that Sam took active action in the act of calling while the action lends power to Alex, who is being called. To avoid gender bias in crowdsourcing, the agent and themes were replaced with placeholders, e.g. "X called Y". Power differential between agent (AG) and theme (TH) was denoted  $power(AG > TH)$ ,  $power(AG < TH)$ ,  $power(AG = TH)$ . Agency was denoted  $agency(AG) = +$  or  $agency(AG) = -$ . When including moderate labels as agreement, label agreement was 96% for power and 94% for agency, indicating that a real and consistent phenomenon is being captured by these frames. The distributions skewed strongly toward agent-power and positive agency.

Table 1 provides some sample verbs and their crowdsourced labels.

### 2.2 Application to Movie Scripts

The authors applied their new connotation frames to a test set of 772 movie scripts from (Gorinski and Lapata, 2015). They assigned gender to characters using a name-gender list and other methods. They applied SpaCy's dependency parser to identify agents, themes, and verbs. They controlled for relative presence of men vs. women in all analyses.

Verb	Agency	Power
abandons	agency_pos	power_agent
accepts	agency_neg	power_agent
accesses	agency_equal	power_agent
accommodates	agency_pos	power_equal
accompanies	agency_equal	power_theme
achieves	agency_pos	power_theme
addresses	agency_neg	power_equal

Table 1: Sample verbs with assigned power and agency.

The authors found that male characters in the analyzed script were portrayed with a higher level of agency overall than female characters. They also found that male characters tended to be the agent of power differentials more often than female characters.

Note: the original authors as well as this author acknowledge that gender does not exist in a binary fashion. However, due to a lack of data on nonbinary actors, characters, and names, only male and female genders will be discussed.

### 2.3 Replication

I did my best to replicate this paper, using the same set of movies. I used the script database linked in their paper and selected the same 772 scripts from their website. I used the same name-gender list linked in the paper. I did not replicate their selection of characters based on the first three narrations, instead checking all proper nouns. I also included a category for “Either” gender, which was excluded from subsequent analyses. Though the paper was not clear on this point, I included pronouns he and she in the parsed sentences. I used SpaCy’s dependency parsing to identify agents and themes and the verbs that linked them. After lemmatizing the verbs and including only gendered agents and themes, I summed the positive and negative power and agency for each script based on the verb list from the original paper for male, female, and either gender. All data, including the title of the movie, were exported as a csv. Most likely due to minor deviations in procedure, I did not get the exact numbers to line up with the original paper, but the overall trends remain consistent: Males had a higher level of agency overall than women and were more frequently the agents of powerful verbs than women. I did not separate by narrative vs. character expression in my analysis as the original

Average Connotation Frame Scores for Movie Reviews

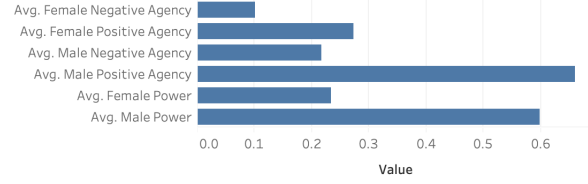


Figure 1: Male power and positive agency are significantly higher than female power and positive agency, and male agency is more likely to be positive than negative as compared to female agency.

work did.

### 3 Bias in Movie Reviews

I used IMDb’s database to apply connotation frames of power and agency to hundreds of film reviews obtained from Maas et al. (2011). While I continued to use the same name-gender list<sup>1</sup> as used in the original paper, I supplemented this by checking all proper nouns against the IMDb (2021) database and labeling them “Male” if they matched with an actor and “Female” if they matched with an actress. Because film reviews frequently reference actors, this is a legitimate way to more accurately obtain genders than relying on the masculinity or femininity of a given name that can be employed for several cases. From there, the process was unchanged from that of the movie scripts; I used SpaCy’s dependency parsing<sup>2</sup> to identify agents and themes and the verbs that linked them, lemmatized verbs, and summed the positive and negative power and agency for each review for male, female, and either gender. All data, including the title of the movie being reviewed, were exported as a csv.

My findings from the review scores were similar to those found based on film scripts; males had a higher level of agency overall than women and were much more frequently the agents of powerful verbs than women. See Figure 1 for a comparison of the average scores across all movie reviews.

### 4 Reviews vs. Films

There were 62 movies for which I had both script and review data. I normalized the data from all reviews for each of these 62 movies (most of them had multiple reviews for that title, though a different number for each). I then compared each

<sup>1</sup><http://www.cs.cmu.edu/Groups/AI/util/areas/nlp/corpora/names/0.html>

<sup>2</sup><https://spacy.io/>

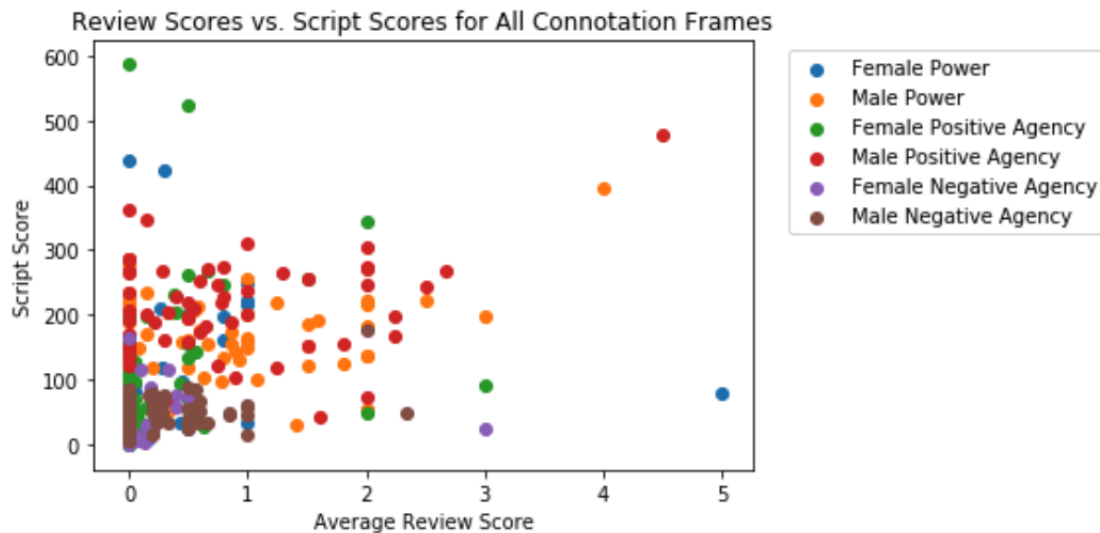


Figure 2: Plotting the average review score for a film against the score obtained by its script for each connotation frame results in a positive correlation.

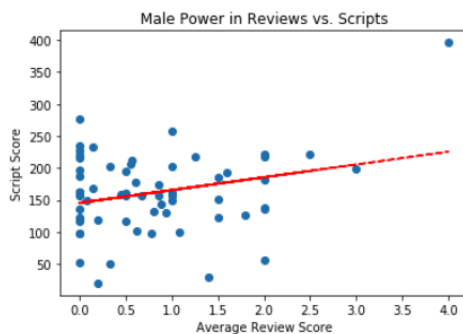


Figure 3: The trend line clearly demonstrates that high levels of male power in source material is correlated with high levels of male power in reviews.

framework for film scripts vs. the reviews for that film. I found a positive correlation across all six dimensions (male and female power, male and female positive and negative agency), with the weakest, female negative agency, having a Pearson correlation of .104, and the strongest, male negative agency, having a Pearson correlation of .329. The fact that the weaker correlations were observed when many films' normalized review score was zero suggests that the correlation is real and might be dampened by a lack of data. Figure 2 shows the aggregate of all plotted connotation frames, in which a positive correlation is visible. Figure 3 shows the plot for just Male Power, which had a Pearson correlation of .276.

These results are not entirely surprising, as part of this correlation might be attributed to reviews'

need to cover basic plot points, which will engender the same power and agency attributes as the film, and serves as a very loose verification of the connotation frame concept's cross-platform applicability. Extending the analysis a bit, this positive correlation could also indicate that the way people talk about films is inherently colored by the biases present in the films themselves, which provides further evidence that the biases present in media have true effects in the real world.

## 5 Conclusion

Measuring gender bias in language is a complex task. The formulation of connotation frames of power and agency is a useful one for demonstrating the subtle ways in which different genders are subject to implicit biases. My work applies this systematic framework to a new, but related, domain. Based on the similar outcome when the frameworks are applied to movie reviews, it can be understood that these connotation frames are useful in contexts beyond the very action-based narratives to which they were originally applied. This also presents an extension of the findings beyond largely fictional works into meta-analysis, which is in some ways more adjacent to individuals' true feelings, and finds that biases are still prevalent in that women are discussed with less power and lower levels of agency than men.

The application of the same system to the source material and commentary about the source material allows for interesting analysis of how people

engage with a work of art. If correlations had been negative, for instance, one could draw the conclusion that people inherently buck against the stereotypes that they view. A lack of correlation would show an independence of reviewer from the film. However, given that demonstrable positive correlations applied across both power and agency, it is clear that the way in which a person engages with a work is shaped by the work itself. This is an interesting area for further analysis.

## 6 References

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