Impact of narrative sentiment reversals on story success

Extended Abstract

How can researchers measure the presence and strength of a story's plot? In this paper, we develop a programmatic, natural language processing (NLP)-based way to measure narrative movement over the course of a text, and show that our measures both positively predict Hollywood movie ticket sales and GoFundMe fundraiser success rates. This method has both direct applications to story-based industries, to help in the evaluation of new projects in movies or book publishing, and could also enable programmatic analysis and evaluation of stories in broader contexts, such as advertising and fundraising.

Data and methods.

We derive our measures from centuries of dramaturgy, following Aristotle and Freytag (1895) through to the more modern terminology of Leon Katz (2012). According to these dramaturgs, plot draws readers and viewers into the story through a mechanism of repeated *build-up* (or tension) and *release:* after the protagonist has been hearing the scufflings of the monster in the darkness for some time, and then the monster suddenly *jumps out;* after the lovers have been searching for one another in the crowded hall for a long time, and then suddenly lock eyes; after the hero has been beaten down conclusively by the villain, and then suddenly seizes an opportunity to catch the villain off-balance and abruptly sends him tumbling off a cliff. And the viewer's heart jumps, and the reader is enthralled.

We use sentiment analysis to detect the presence of these "reversals" by measuring sentiment reversals over the course of a narrative's arc, using averages of measured word sentiment following Reagan et al. (2016) and Berger et al. (2021). We leverage a time series tool developed for detecting stock market trend reversals to detect reversals in the time series of sentiment, and then produce two primary measures for each story: the average height of reversals, measured by the peak-to-trough distance of the given reversal, and the total number of such reversals over the course of the movie. We use movie subtitles and GoFundMe pitches, respectively, to form the text basis for this sentiment analysis over the course of story.

While previous work has used NLP-based approaches to build measures of stories (e.g., Berger et al. (2021) and Toubia et al. (2021)), much of this earlier research has been relatively theory-agnostic in relation to existing paradigms of dramaturgy. In this project, we operationalize the insights of millennia of dramaturgy to build measures of higher-level story phenomena previously uncaptured by these other approaches, and show that it has significantly improved predictive strength across domains.

Results.

We find that both measures positively predict success of movies (operationalized by ticket sales of movies, viewer ratings and critical response) and also positively predict the success of GoFundMe pitches (operationalized by likelihood of reaching their goal and the proportion of the goal that they raise).

For movies, we find that both the number of reversals in a text and the height meaningfully predict both ticket sales and viewer ratings, with p-values below 0.01, and that

the number of reversals similarly predicts critical response (Metascore rating). The relationship between critical response and height of reversals is large and positive, but slightly noisier. We also find that number of reversals and height of reversals appear relatively inversely correlated—informally, it appears that the more reversals that a writer introduces, the harder it is to develop each individual reversal to its maximal height and drama. However, higher-IMDB movies consistently achieve a tradeoff that's pushed-out relative to lower-IMDB movies: the superior-written movie is able to both maintain and develop thicker plots than the inferior-written.

Finally, we extend our method to GoFundMe pitches, and show that our plot measures also significantly predict which pitches are most likely to succeed. Conceptually, narrative movement metrics are meaningful only for longer texts, so we focus on pitches of 1000 words or longer. We find that GoFundMe pitches with more sentiment reversals and with greater average reversal height are significantly more likely to reach their goal and succeed by other relevant metrics (proportion of the goal that they raise, as well as the overall amount of money raised when controlling for their goal).

Discussion.

While prior research has started using NLP-based analysis of narratives to develop new measures to quantify previously-qualitative attributes of stories, these measures are relatively coarse, and fail in properly assessing the true higher-level phenomena of narratives that are so important for their potency and success. By marrying this quantitative approach with dramaturgical theory, our work points a new way forward by demonstrating that more meaningful measures can be systematically constructed for better capturing what truly drives audience engagement and emotional response. Finally, by extending our results to fundraisers, we also show that these measures help capture which fundraising pitches are telling a better story, and that those with better stories are more likely to succeed.

References

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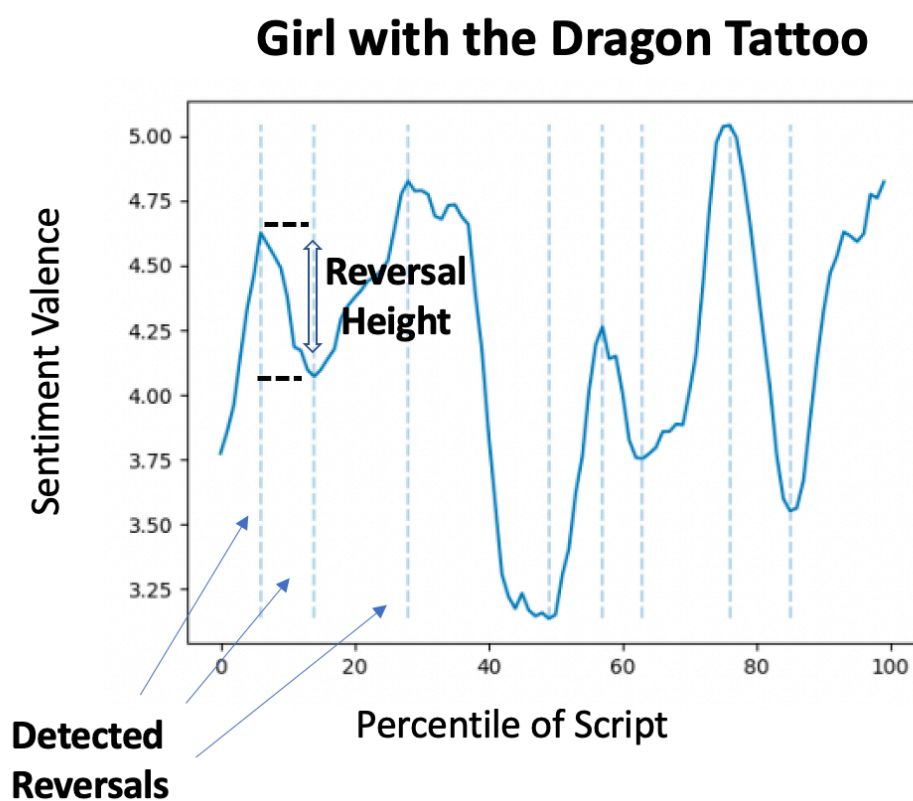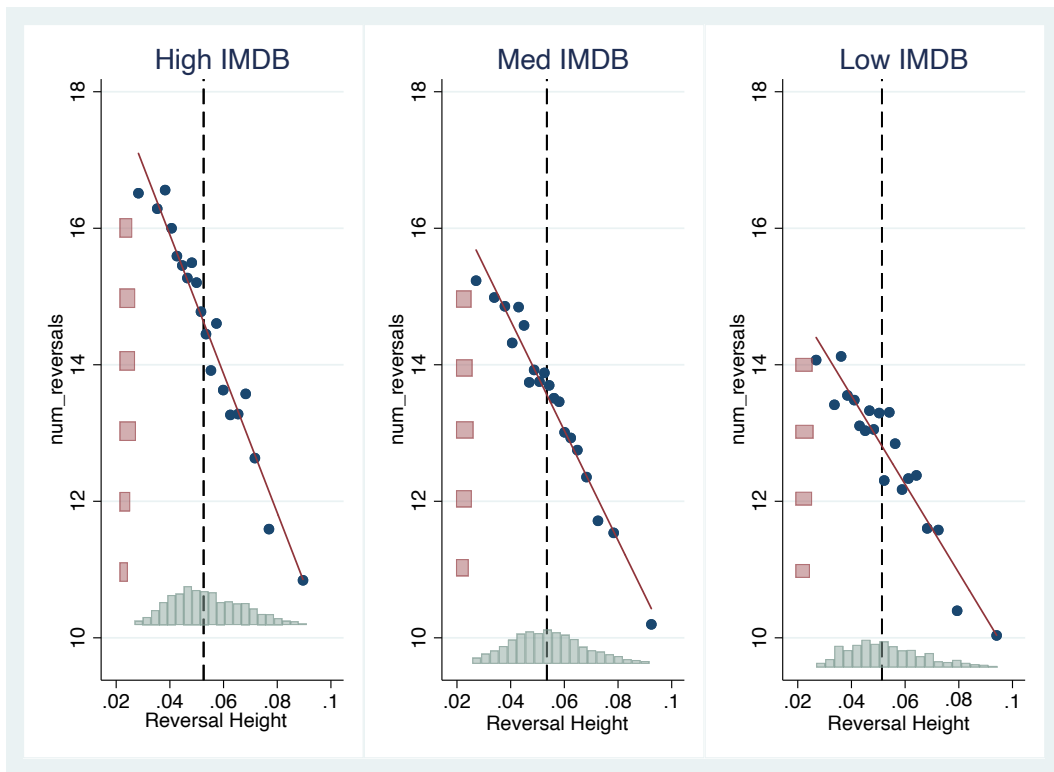
Figure 1. Illustration of reversal measures

Figure 2. Raw Reversal Height and No. Reversals
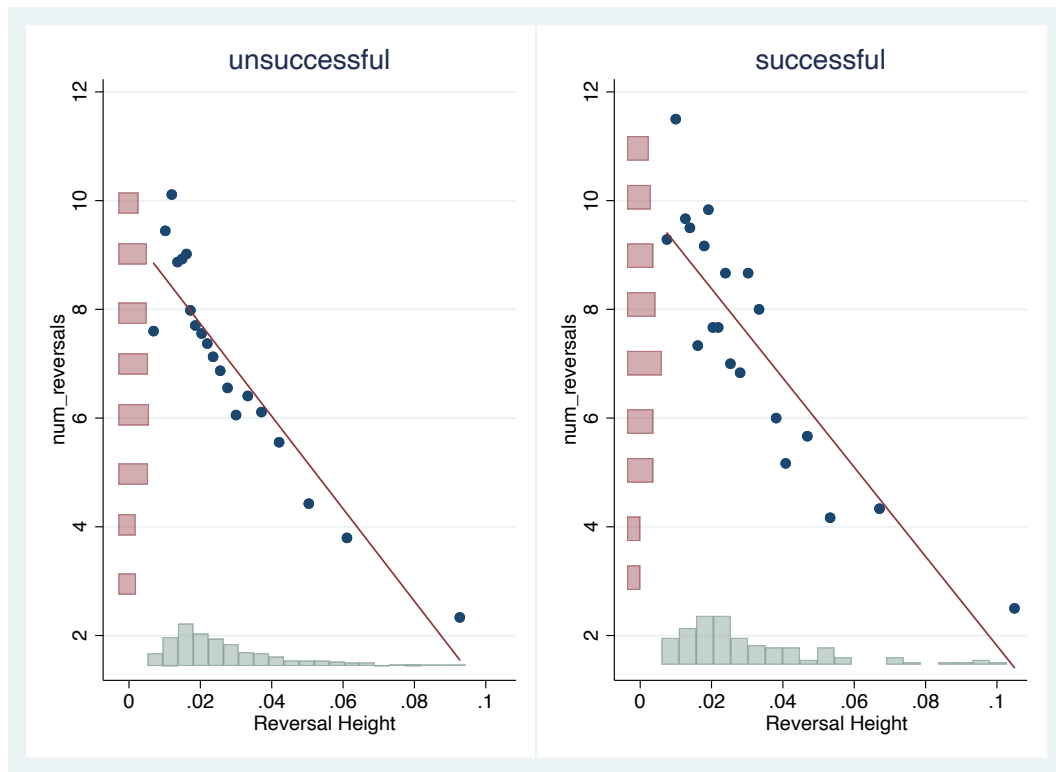binscatters for different IMDB quality buckets: movies

Figure 3. Raw Reversal Height and No. Reversals
binscatters for different IMDB quality buckets: GoFundMe pitches