**MACSS Thesis Proposal**

Is the News Overly Negative? Applying Sentiment Analysis to News Articles During the Covid-19 Pandemic

**Introduction**

The news has a reputation for being attracted to salient negative events, giving rise to the adage, "if it bleeds, it leads." In the case of the Covid-19 pandemic, I test whether it is true that the news mainly focuses on negative events while downplaying positive events (decreasing cases, decreasing hospitalizations, and increasing vaccination numbers). Using SieBERT, a state-of-the-art fine-tuned language model, I calculated the sentiment from over 600,000 articles related to Covid-19 between April 2020 and April 2022. With this data, I plan to run several statistical analyses to test the correlations between article sentiment and Covid-19 health measures across time. Further analysis will be done by partitioning the data based on the publisher’s political affiliation, differences across countries, what page the article was published on, the number of articles published about Covid-19 over time, and more. These findings are incredibly important toward understanding the news’s possible reporting biases and a general picture of how the news reported on Covid-19. My project offers the first assessment of how the news sentiment changed in response to local health metrics throughout the pandemic: testing the hypothesis that the news has an overly negative bias, even while things are getting better.

**Background Literature**

If you are a newsreader, you likely have noticed a pattern of negative stories consistently making the top headlines. This is not an artifact of the internet, nor of our contemporary society—it can be traced back to at least as early as 1965 when a team of researchers noticed that negativity was a core component of what made a story “newsworthy” (Galtung & Ruge, 1965). When looking at the bigger picture, the news has been getting gloomier since as early as 1945, with sharp decreases after 1990 (Leetaru, 2019). This is a surprising finding given the fact that during the same time that the news has become more depressing, life in the western world has been getting consistently better across metrics such as crime, health, income, relative inequality, human rights, and technological innovation (Pinker, 2018). Hence, it is well accepted that the news has a proclivity toward focusing on negative news stories—what I refer to as the news's negativity bias.

**Suppositions and implications**

The pandemic is a unique case for news sentiment since it was filled with a series of both good and bad events. The bad events are all too apparent with over a million people dead and many more who are still impacted by long Covid. On the other hand, there were unprecedented advancements in vaccine development and successful attempts at decreasing case numbers through vaccination, social distancing, and natural immunity. Given these mixed events, it is not clear from the outset which kinds of events the media was most drawn to report on. Nor if the news was even-handed when reporting positive and negative events. The assumption underlying my thesis is that fair news coverage will have a sentiment score trend that correlates strongly with objective health metrics and that the strength of the correlation is equally strong across good and bad events. For instance, we would expect news articles *on average* to become more positive when Covid cases are decreasing and become more negative when Covid cases are increasing. To give an example of where this can go wrong, assume during the massive decline in cases after the Omicron wave that many news articles reported focused on the few cities that had increasing Covid cases while failing to mention that Covid cases across the country were plummeting. These types of articles would fail to correlate with health metrics, but more importantly, would fail to give their viewers an accurate representation of the world.

It's reasonable to assume that an overly negative news media is not a bad thing since it would be following a “better safe than sorry” mindset. There is a risk that being too optimistic can lead to precautions being relaxed before it is warranted. However, there is strong evidence that an overly negative news bias is detrimental to both our well-being and having an accurate understanding of the world around us. For one, negative news has been shown to cause increases in stress, lower trust in news sources, and lead to unrealistic beliefs about the world (Association, 2017; Johnston & Davey, 1997; Slovic Paul, 1987). It may not be a coincidence that the sharp increase in negative news stories starting around 1990, coincides with a general increase in news consumption, and a decrease in U.S happiness (that is continuing to this day) (Twenge, 2019). Further, in 2021, trust in U.S media sources hit an all-time low which is known to be partly caused by high negative news consumption (Brenan, 2021). Given the importance of trusting news sources during a pandemic, understanding how news sentiment responds to health measures can offer insight into what the news is doing right or wrong. If the news is constantly focusing on negative events, people may tune out and fail to take seriously the next viral outbreak. Finally, isolating news articles by political affiliation can also reveal differences (or similarities) in news reporting patterns across the political spectrum—furthering our understanding of the contemporary political divide in America as it relates to Covid-19.

**Data and Methods**

The article data comes from ProQuest TDM Studio which owns the copyrights to hundreds of different news publications. The neural network that will be used to predict the article sentiment is SieBERT, a neural network model that I further fine-tuned on over 1000 Covid-19 annotated articles. When tested on the ProQuest data it has s 93% accuracy and F1 score. In comparison, dictionary methods get around 60% accuracy on the same test set (which is currently the popular approach among contemporary studies). The Covid-19 health data comes from Our World in Data`s Covid-19 database. The relevant health metrics are weekly indicators such as the Covid positive rate, new hospitalizations, new vaccines administered, new deaths, and new cases.

Bootstrapping will be used to estimate the variance of the daily sentiment score and can create confidence intervals. Regression analysis with time lags will be used to describe the trend between health measures and the daily sentiment score. Finally, descriptive statistics will be used to compare the differences in sentiment scores across political affiliations (Liberal, Moderate and Conservative). Other methods can be used depending on further findings.

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