

# A Sentiment Analysis of Frankenstein

Can plot be divined?

## Overview

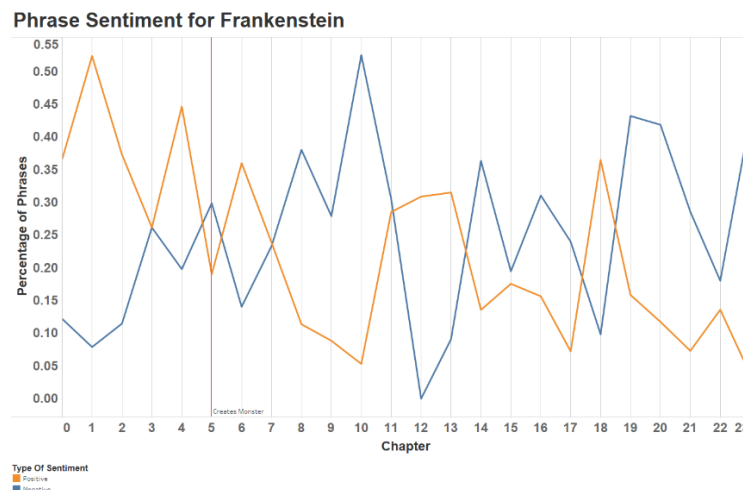
Sentiment analysis is used by many organizations to help infer attitudes and intentions of their customers or users. Like other analysis tools, it is most helpful to understand it's strengths and weaknesses to help interpret its results. Testing a tool against a known quantity is one way to help determine how much an analyst can rely on the results provided by the tool.

In this exercise, we perform sentiment analysis on the novel "Frankenstein" by Mary Shelly. The plot of this novel concerns a scientist in the 1700's who uses the knowledge of modern science in an attempt to overcome death itself. His experiment involves re-animating a formerly deceased body. However, upon the creation of this new life, Dr. Frankenstein realizes he has created an abomination of nature. Dr. Frankenstein must deal with the repercussions of this new life, and his responsibility toward it and the world they both inhabit.

The benefit of using "Frankenstein" as a source of study is that it is a well known story and has been thoroughly analyzed by many critics. This provides a large volume of study to compare with sentiment analysis. Another advantage is that it is not a contemporary novel, which highlights certain biases of modern sensitivity analysis that may not be visible with a more contemporary comparison. Being aware of certain biases in analysis is important to help avoid making assumptions by researchers.

## Analysis

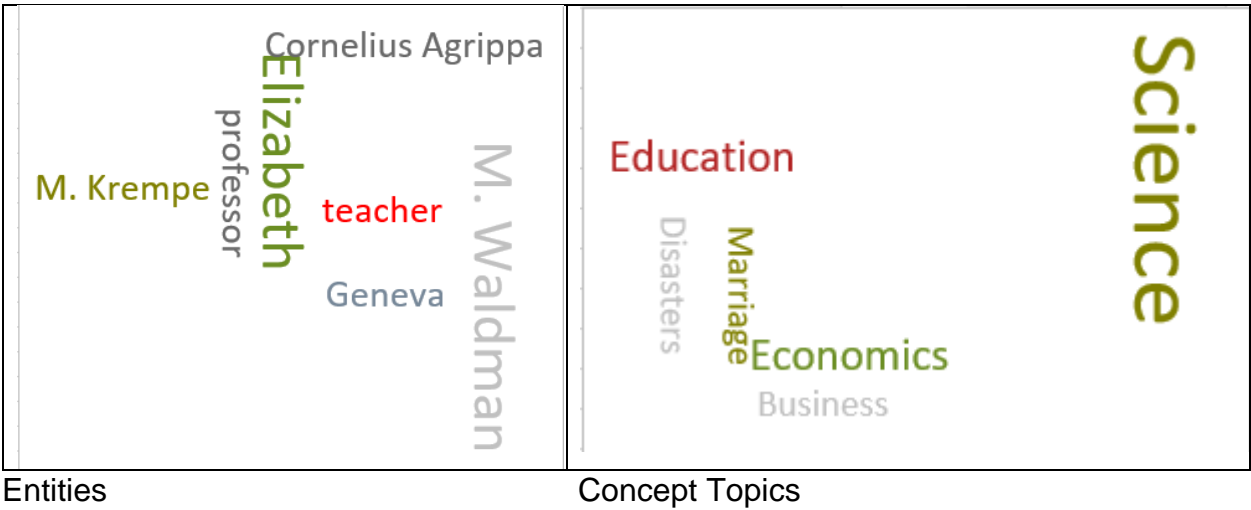
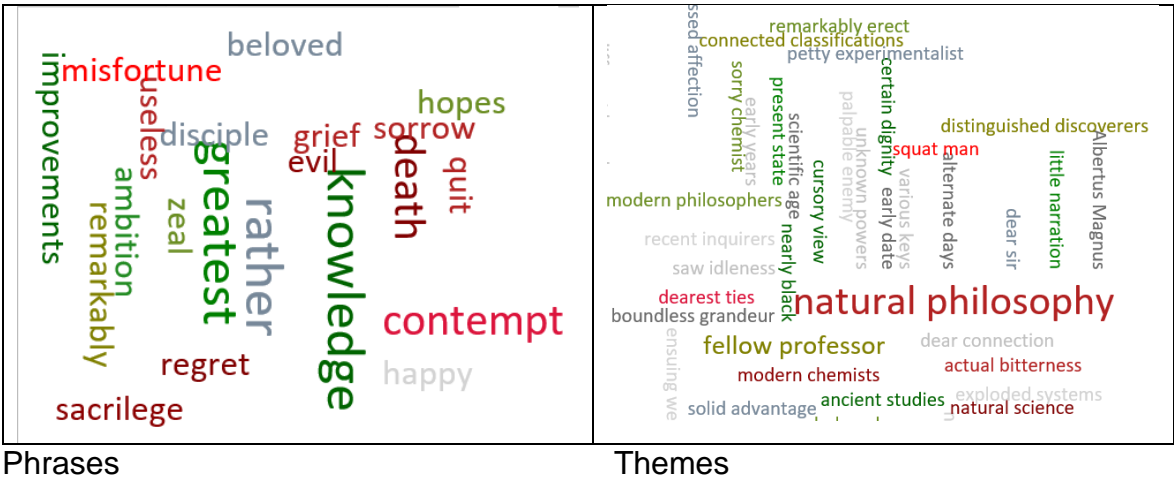
While the novel Frankenstein is filled with dark and negative imagery, it also has positive sentiment as well. The story starts on a relatively positive note, taking place in Victor Frankenstein's childhood. In Chapter 3 and 4, Victor is attending college and learning about science, which gives him purpose. In Chapter 5, he has created the "monster", which is the start of his life long torment. Using Semantria data to review themes, we can calculate the percentage of themes for each chapter which are positive, negative, or neutral. Comparing the positive to the negative themes, the number of positive themes starts higher, but declines toward chapter 5, while the number of negative themes increases. This coincides with the flow of the book.



Chapters 7 and 8 involve the murder of Dr. Frankenstein’s younger brother by the monster. The monster frames the family servant who is blamed and executed for the crime. We see an increase in the phrases with negative sentiment as well as a decrease in the amount of phrases with positive sentiment during these chapters. This begins the turbulent experiences of Dr. Frankenstein as he deals with the monster.

It is possible to gather some of the plot points of the story by reviewing the overall phrases, themes, entities, and concepts presented by the sentiment analysis software. If we look at Chapters 3, 4, and 5. We can see a transition in the story line.

Starting with Chapter 3, we see these phrases:



From the phrases, we see that “Knowledge”, “Ambition”, and “Zeal” have positive sentiment, but are countered with “Contempt”, “Grief”, “Evil”, and “Regret”. This suggests aspirations, but with difficulty. Some of the negative themes help fill in some gaps. “Natural Philosophy”, “Modern Chemist”, and “Natural Science” all have negative connotation, despite Victor Frankenstein’s pursuit of scientific knowledge. The entities and concepts hold the key negative phrases of “teacher” and “Education”. In the concepts, “Science” also has a more positive sentiment, which seems opposite of the negative sentiments found in the themes. Together, this

suggests that Victor aspires to gain great scientific education, but is possibly being hindered by a specific teacher or the formal educational system. Whether this represents him failing in these subjects, or a basic disagreement, it reflects a conflict.

Chapter 4 uses some of these terms:

Phrases	Themes	Entities	Concepts
<b>Knowledge</b> <b>Enthusiasm</b> <b>Success</b> <b>Eagerness</b> <b>Experienced</b> <i>Lifeless</i> <i>Death</i> <i>Toil</i> <i>Corruption</i>	<b>Natural Philosophy</b> <b>Chemical Instruments</b> <b>True Friend</b> <b>Supreme Delight</b> <i>Bestowing Animation</i> <i>Lifeless Matter</i> <i>Certainly Unlawful</i>	<b>Prof. Krempe</b> <b>Cornelius Agrippa</b> <b>Greece</b> <b>Caesar</b>	<b>Science</b>

In Chapter 4, the positive sentiment has increased. “Natural Philosophy” has gone from negative to positive, with terms like “True Friend” and “Prof. Krempe”, and “Cornelius Agrippa” who was known for the occult. This suggests that Victor Frankenstein has had some success with his studies. This may be related to Prof. Krempe assisting him in some manner. The themes with negative sentiment, however, suggests there is some darkness underlying the lighter sentiment.

In Chapter 5, as stated above, we know that Victor creates his monster. We see these terms with Chapter 5.

Phrases	Themes	Entities	Concepts
<b>Joy</b> <b>Friend</b> <i>Monster</i> <i>Wretch</i> <i>Ill</i> <i>Horror</i>	<b>Good Fortune</b> <b>Necessary</b> <b>Knowledge</b> <b>Dutch Schoolmaster</b> <b>Sufficient Rest</b> <i>Dead Mother</i> <i>White Steeple</i> <i>Disturbed Imagination</i> <i>Misearable Monster</i>	<b>Elizabeth</b> <b>Henry Clerval</b> <i>Frankenstein</i> <i>Henry</i>	<i>Food</i> <i>Weather</i>

Phrases such as “Friend”, “Elizabeth” and “Henry Clerval” suggest that the positive aspects in chapter 5 were Victor’s friends and family. He also appeared to have good progress with his schooling with “Good fortune”, “Necessary Knowledge”, “Dutch Schoolmaster” and “Sufficient Rest”. However, these are offset by very negative images of “Monster”, “Wretch”, “Ill”, “Horror”, “Dead Mother”, “Disturbed Imagination”, “Miserable Monster”. These suggest something terrible has happened. It is perhaps related to his mother through either illness in the cold weather, famine, or bad food. Of note is that “Frankenstein” now takes a negative connotation. This may be related to self image, or possibly some shame of his family name. Henry is also negative and positive. That may suggest a change in Victor’s attitude during the course of the chapter.

## Conclusion

Overall, having read the book, the sentiments on chapters 3 and 4 are fairly accurate. Chapter 5 is also correct, but it is not certain from the phrases that Victor has actually created a monster. Imagery of death, disease, and dead bodies are present in earlier chapters, so it is not clear from these descriptions what has actually occurred. However, even with this limitation, it is clear how well sentiment analysis can illuminate the meaning behind normal text. The number of positive and negative phrases follow the mood of the different chapters fairly well, and the phrases, themes, elements, and concepts illustrated in the analysis fit the plot relatively well.

Researches also need to take note of biases within the tool itself. In Chapter 7, the auto-categories created an association to photography, even though that technology did not exist within the context of the story. This may be from phrases like “image” or “picture” that are associated with photography. It’s critical for researchers to study the language, text, and culture before performing analysis so they can make adjustments to these associations within the tool itself.

## Research Overview:

The text for Frankenstein was copied from Project Gutenberg. Extraneous text was removed for analysis. That removed text is included below. To prepare the text to be analyzed by Semantria, a Python program was used to split the text into sections < 2048 characters long, and by chapter. For some reason, the last chapter was not produced correctly. The analysis included the pre-lude letters (chapter 0), up through the second to last chapter (chapter 23). The program listing is included.

The number of positive and negative sentiments was done by sorting by sentiment score and calculating the number and percentage by chapter. Neutral sentiments were not included for clarity.

A summary of the chapters was used to help correlate the analysis with the book plot. Those were derived from the Frankenstein Spark Notes, and are included below.

## Python Code

```
def write_lines(all_lines: list, outpath: str):
    header = "Line,Text\n"
    outfile = open(outpath, "w")
    outfile.write(header)
    for line_num, line_str in all_lines:
        line_str = line_str.strip()
        outline = str(line_num) + ',' + '"' + line_str + '"' + "\n"
        outfile.write(outline)

    outfile.close()
    return True

filepath = "<FILEPATH REDACTED FOR PRIVACY>"
inpath = filepath + "/FRANKENSTEIN2.txt"
outpath = filepath + "/F_ch_0.csv"
line = " "
search = "Chapter"
chp_num = -1
item_count = 0
line_lens = []
infile = open(inpath, "r")

all_lines = []

while line:
    line = infile.readline()
    if len(line) > 1:
        if search in line:
            item_count = 0
            chp_num += 1
            chp_name = "F_ch_" + str(chp_num) + ".csv"
            outpath = filepath + "/" + chp_name
            wrotefile = write_lines(all_lines, outpath)
            all_lines = []
        else:
            while len(line) > 2000:
                # find next space
                pos = line.find(" ", 2000)
                item_count += 1
                line_data = (item_count, line[0:pos+1])
                all_lines.append(line_data)
                line = line[pos:]
            item_count += 1
            line_data = (item_count, line)
            all_lines.append(line_data)

infile.close()
```

## Chapter Summary

(Used for analysis. Paraphrased for brevity)

Letter 1: Introduction to story teller. Aspiration to discover the north pole.

Letter 2 & 3: Hires a ship in St. Petersburg and starts his journey north.

Letter 4: Stuck in ice. They see the monster. They pick up Frankenstein. Frankenstein tells them his story.

CHP 1: Personal history of Frankenstein's childhood. They adopt his future wife.

CHP 2: Grows up, studies science, becomes fascinated with electricity

CHP 3: Heads off to college. Mother dies of scarlet fever. Professor criticizes Frankenstein's earlier studies. Is inspired by other professor to continue to study science.

CHP 4: Masters science and starts building creature.

CHP 5: Builds creature. Loses creature. Fall sick for 6 months.

CHP 6: Tries to go back to school but is tortured. Plans to return home. Heads to countryside.

CHP 7: Victor heads home. See's monster. Brother William killed – maid (Justine) is accused.

CHP 8: Justine executed. Victor tortured as he knows his monster is to blame.

CHP 9: Victor depressed and suicidal. Heads to alps to revive his spirits.

CHP 10: Hiking in mountain – sees monster who tells Victor his story.

CHP 11: Monster's story: Wanders in search of food. Finds villagers but scares them.  
Ostracized

CHP 12: Hides in shed and observes French family. Teaches himself to read and speak. Sees his reflect for first time.

CHP 13: Continues to learn to read and write by spying on family. Starts to learn about families history.

CHP 14: The monster continues to learn about history of family he is spying on.

CHP 15: The monster finds books to read, and reads Frankenstein's notes. Tries to make friends with old man – is rejected by family.

CHP 16: Vows revenge on all humanity. Wanders to Geneva and finds William. Kills William. Frames the maid. End of his story relayed to Dr. Frankenstein.

CHP 17: Impresses to Victor his loneliness and begs him to make him a similar mate. Victor agrees.

CHP 18: Victor has doubts and reflects on his happiness with Elizabeth. Victor starts a 2 year tour of England and Europe. Henry joins them after some time.

CHP 19: Victor ditches Henry and sneaks off to the Orkneys to a lab to start his work.

CHP 20: Victor has doubts. He sees the monster. He destroys his work. The monster vows vengeance. Receives letter from Henry. Victor dumps the body in the lake. He is arrested for a different murder.

CHP 21: The murder victim is Henry. Victor falls ill and remains in jail. Victor is visited by his father. He is acquitted of the murder.

CHP 22: Victor heads home to marry Elizabeth. Plans to confess after they are married. They get married and head to a cottage.

CHP 23: Victor is worried about the monster. Guards the house, but the monster kills Elizabeth. Father dies several days later. Tries to tell magistrate, but magistrate does not believe Victor. Victor vows to destroy monster.

CHP 24: Victor tracks monster north. He runs into Walton, tells his story. Walton's crew asks to return to England. Victor convinces them to continue North, but 2 days later they ask again. Just as ship is freed, Victor dies. Walton finds monster weeping over Victor. Monster vows to commit suicide.



## References

*Frankenstein; Or, The Modern Prometheus* by Mary Wollstonecraft Shelley (Oct 1, 1993). Retrieved May 4<sup>th</sup>, 2021 from Gutenberg.org site. <https://www.gutenberg.org/ebooks/84>

*Frankenstein Spark Notes* (n.d.) Retrieved May 4<sup>th</sup>, 2021 from SparkNotes site. <https://www.sparknotes.com/lit/frankenstein/>

*Heinrich Cornelius Agrippa* (Feb 2, 2021) from Wikipedia site [https://en.wikipedia.org/wiki/Heinrich\\_Cornelius\\_Agrippa](https://en.wikipedia.org/wiki/Heinrich_Cornelius_Agrippa)