

The Linguistic Landscape of Stream-of-Consciousness Literature*

Exploring Word Frequency and Mental Health Themes in the Works of Joyce, Woolf, Proust, Mansfield and Eliot from Project Gutenberg

Quang Mai

April 3, 2024

This project focuses on understanding the language used by renowned, transnational stream of consciousness authors James Joyce, Virginia Woolf, Marcel Proust, Katherine Mansfield and T.S Eliot. By conducting word frequency analysis and sentiment analysis of their famous works, I explore mental health themes like anxiety, depression, trauma, and existential angst. Through word frequency analysis of nine novels, I aim to uncover shared linguistic patterns and gain insights into the authors' mental states, offering a glimpse into themes of self-identity and existential contemplation. (add one sentence on main results)

Table of contents

1	Introduction	1
2	Data	3
2.1	Measurement	3
2.2	Source Data	3
2.3	Data Cleaning and Word Tokenization	3
2.3.1	Word Count	3
2.3.2	Comparative Word Frequency	4
2.3.3	Generating Word Networks	5
3	Model	5
3.1	Model set-up	5
3.1.1	Model justification	6

*Code and data are available at: <https://github.com/ponolite/stream-consciousness-language.git>

4	Results	6
4.1	The Dominant Vocabulary of Stream of Consciousness	6
4.2	Sentiment Analysis	8
4.3	Gendered Mental Landscape of Stream of Consciousness Novels	9
4.3.1	Comparing Female Stream of Consciousness Authors	9
4.3.2	Comparing Male Stream of Consciousness Authors	9
4.4	Transnational Stream of Consciousness Novels and Mental Health Themes . . .	10
4.5	Combined Texts: Trends, Word Networks, Bigram and Trigram Analsis	11
5	Discussion	11
5.1	Mental Health Vocabulary: Patterns and Trends	11
5.2	Insights into Socio-Political Landscape of the West’s Modernist Era	11
5.3	Schizophrenic and Disassociative Tendencies in Female Stream of Consciousness	13
5.4	Weaknesses	13
5.4.1	Lack of Thorough Word Cleaning	13
5.4.2	Limiting Literature Works and Publication Editions	13
5.4.3	Uneven Novel Length and Categorization of Authors	13
5.4.4	Project Gutenberg’s Focus on the Canon	13
5.5	Moving Forward and Next Steps	13
6	Appendix	14
6.1	Additional Data Details	14
6.1.1	Data Gathering	14
6.1.2	Data Cleaning	14
6.2	Model Details	14
6.3	Posterior predictive check	14
6.4	Diagnostics	14
	References	15

1 Introduction

Stream of consciousness is a narrative technique that aims to capture the continuous flow of thoughts, feelings, and sensations experienced by a character without conventional organization or punctuation (Bernini and Fernyhough 2022). It mirrors the unpredictable and interconnected nature of human thought processes, often revealing the inner workings of the character’s mind in an intimate and unfiltered manner (Long and So 2016). In literature, most scholars agree that stream of consciousness reveals the complexities of mental-scapes, shedding light on the nuances of characters’ emotional well-being and psychological struggles (Nyongesa 2023). Its relationship to mental health lies in its ability to offer insight into the depths of consciousness, providing a platform to explore themes such as anxiety, trauma, and existential questioning. As such, this paper has mined the texts of a total of nine novels from the

volunteer archive, Project Gutenberg, to examine the mental health themes of famous stream of consciousness authors, namely by Joyce, Woolf, Proust, Mansfield and Eliot, from the modernist era of literature, spanning from late 19th century to the mid-20th century (“Project Gutenberg,” n.d.). (more stats and data mentioned here)

By analyzing these textual datasets through word frequency and sentiment analysis, I seek to pose and answer crucial questions: *What are some important factors contributing to this relationship between mental health, disassociation and stream of consciousness? Moreover, how does this relationship vary differently across different demographics of authors, for instance, authors with different geographical locations and genders?* Understanding these dynamics is crucial in having an informed understanding of the West’s late 19th to mid-20th century socio-political landscape, especially in regards to how authors and creative writers navigate and deal with then-taboo topics such as existential angst, mental health issues and disabilities.

Thus, my estimand is the correlation between famous stream of consciousness novels, words related to mental health themes and their frequency. This is considered in terms of the nine selected novels only, namely Joyce’s *A Portrait of the Artist as a Young Man* and *Chamber Music*; Woolf’s *Mrs Dalloway* and *Jacob’s Room*; Proust’s *Swann Way*; Mansfield’s *Bliss* and *The Garden Party*; and Eliot’s *The Waste Land* and *The Love Song of J. Alfred Prufrock*. Through our analysis, we found that (percentage, number and data here, main results)...

To further understand the correlation between stream of consciousness novels and mental health themes, in [Introduction](#), our paper briefly discusses the nature of stream of consciousness literature, relevant authors and the works that we’ve chosen to analyze. Subsequently, in [Data](#) and [\[Result\]](#), we talk about the nature of the data obtained and analyze the results garnered from the data with suitable tables and charts. Next, [Discussion](#) provides further insights and future areas of study. Finally, [\[Conclusion\]](#) summarizes our main findings. To complete the paper, [Appendix](#) clarifies how each variable within each dataset is generated and tables to accordingly demonstrate this.

The novel texts used for analysis were sourced from Project Gutenberg under the library `gutenbergr` (Johnston and Robinson 2023) (“Project Gutenberg,” n.d.). Data was generated, extracted and cleaned using the open-source statistical programming language R (R Core Team 2022), leveraging functions from `tidyverse` (Wickham et al. 2019), `tidytext` (Julia Silge and Robinson 2016), `rmarkdown` (Allaire et al. 2024), `dplyr` (Wickham et al. 2022), `ggplot2` (Wickham 2016), `scales` (Wickham, Pedersen, and Seidel 2023), `here` (Müller 2020), `igraph` (J. Silge and Robinson 2006), `widyr` (J. Silge and Robinson 2022), `ggraph` (Pedersen 2024), `textdata` (Hvitfeldt 2022), `tm` (Feinerer, Hornik, and Meyer 2008) and `knitr` (Xie 2014).

Table 1: Table of Number of Classes Students Considered for Regrade Requests by Students' Gender

2 Data

2.1 Measurement

2.2 Source Data

2.3 Data Cleaning and Word Tokenization

2.3.1 Word Count

Table 2: An Exemplary Table Containing Unprocessed Novel Text (James Joyce)

Book ID	Text	Book	Author
2817	To deep and deeper blue,	Chamber Music	James Joyce
2817	NA	Chamber Music	James Joyce
2817	III At that hour when all things have repose,	Chamber Music	James Joyce
2817	O lonely watcher of the skies,	Chamber Music	James Joyce
2817	NA	Chamber Music	James Joyce
2817	IV When the shy star goes forth in heaven	Chamber Music	James Joyce
2817	All maidenly, disconsolate,	Chamber Music	James Joyce
2817	NA	Chamber Music	James Joyce
2817	V Lean out of the window,	Chamber Music	James Joyce
2817	Goldenhair,	Chamber Music	James Joyce

Table 3: An Exemplary Table Containing Tokenzied Novel Text (James Joyce)

Book ID	Book	Author	Word
4217	A Portrait of the Artist as a Young Man	James Joyce	<i>april</i>
4217	A Portrait of the Artist as a Young Man	James Joyce	27
4217	A Portrait of the Artist as a Young Man	James Joyce	father
4217	A Portrait of the Artist as a Young Man	James Joyce	artificer

Table 3: An Exemplary Table Containing Tokenzied Novel Text (James Joyce)

Book ID	Book	Author	Word
4217	A Portrait of the Artist as a Young Man	James Joyce	stand
4217	A Portrait of the Artist as a Young Man	James Joyce	stead
4217	A Portrait of the Artist as a Young Man	James Joyce	dublin
4217	A Portrait of the Artist as a Young Man	James Joyce	1904
4217	A Portrait of the Artist as a Young Man	James Joyce	trieste
4217	A Portrait of the Artist as a Young Man	James Joyce	1914

Table 4: An Exemplary Table Containing Word Count of Each Word within Novel Texts (James Joyce)

Word	Count
stephen	373
god	194
eyes	180
soul	178
father	151
life	131
cranly	124
dedalus	124
day	123
time	121

2.3.2 Comparative Word Frequency

Table 5: Word Frequency of Stream of Consciousness Novels, A Comparison Between Five Authors

Word	James Joyce	Katherine Mansfield	Marcel Proust	T.S. Eliot	Virignia Woolf
abandon	0.000112	NA	8.19e-05	NA	NA
abandoned	0.000112	NA	8.19e-05	NA	NA
abandonment	0.000112	NA	8.19e-05	NA	0.0001421
abase	0.000112	NA	NA	NA	NA
abased	0.000112	NA	NA	NA	NA
abasing	0.000112	NA	NA	NA	NA
abbey	0.000112	NA	NA	NA	0.0001421
abbots	0.000112	NA	8.19e-05	NA	NA

Table 5: Word Frequency of Stream of Consciousness Novels, A Comparison Between Five Authors

Word	James Joyce	Katherine Mansfield	Marcel Proust	T.S. Eliot	Virignia Woolf
abetted	0.000112	NA	NA	NA	NA
abhorring	0.000112	NA	NA	NA	NA
abiding	0.000112	NA	NA	NA	NA
abject	0.000112	NA	8.19e-05	NA	NA

2.3.3 Generating Word Networks

3 Model

The goal of our modelling strategy is twofold. Firstly,...

Here we briefly describe the Bayesian analysis model used to investigate... Background details and diagnostics are included in Appendix [6.2](#).

3.1 Model set-up

Define y_i as the number of seconds that the plane remained aloft. Then β_i is the wing width and γ_i is the wing length, both measured in millimeters.

$$y_i | \mu_i, \sigma \sim \text{Normal}(\mu_i, \sigma) \quad (1)$$

$$\mu_i = \alpha + \beta_i + \gamma_i \quad (2)$$

$$\alpha \sim \text{Normal}(0, 2.5) \quad (3)$$

$$\beta \sim \text{Normal}(0, 2.5) \quad (4)$$

$$\gamma \sim \text{Normal}(0, 2.5) \quad (5)$$

$$\sigma \sim \text{Exponential}(1) \quad (6)$$

We run the model in R (R Core Team 2023) using the `rstanarm` package of (`rstanarm?`). We use the default priors from `rstanarm`.

3.1.1 Model justification

We expect a negative relationship between average household income and the number of children per child care space by ward. In particular...

We can use maths by including latex between dollar signs, for instance θ .

4 Results

4.1 The Dominant Vocabulary of Stream of Consciousness

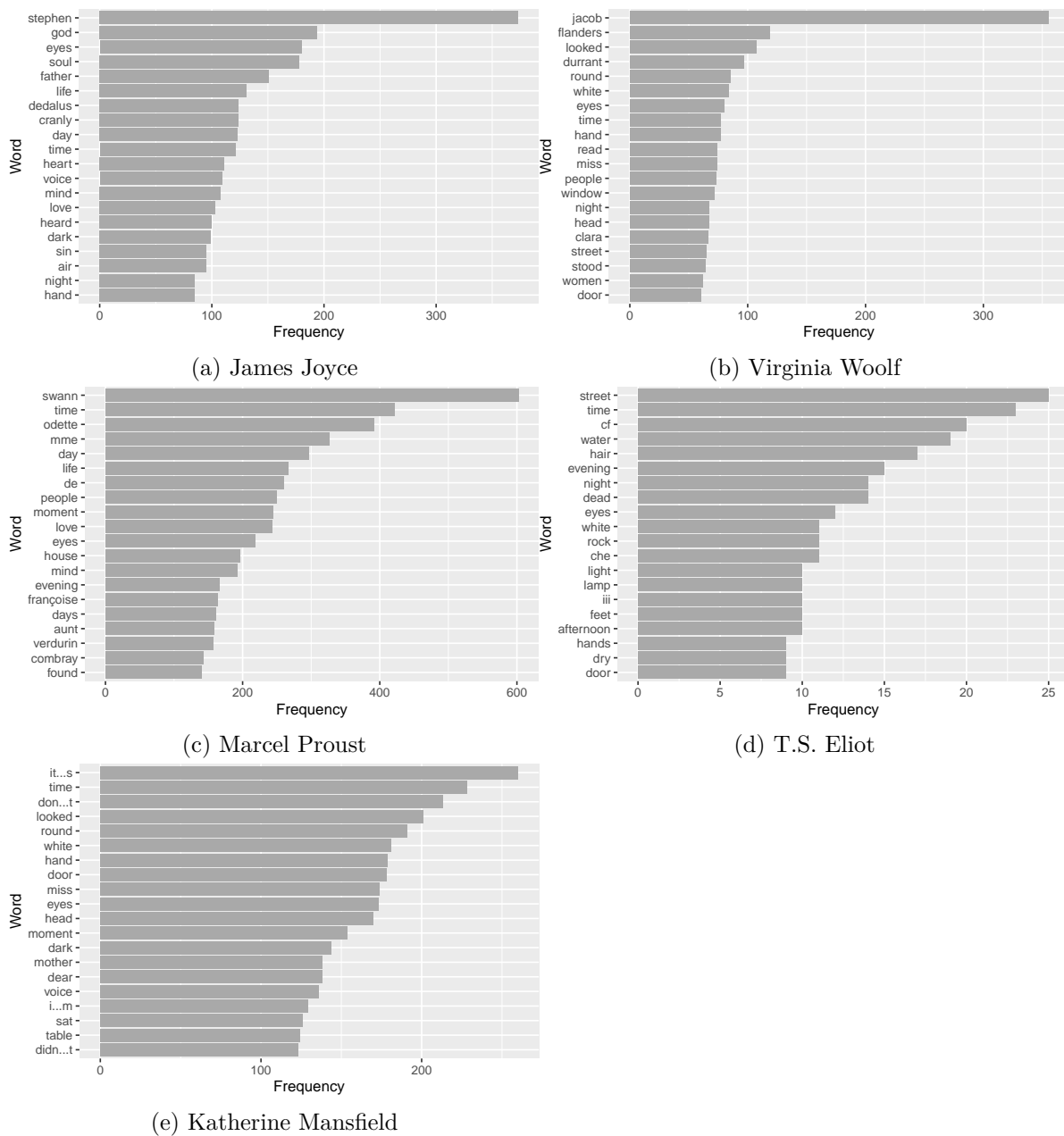


Figure 1: Comparative Analysis of Top 20 Word Frequencies by Stream of Consciousness Authors' Novels

4.2 Sentiment Analysis

Leveraging sentiment analysis from Mohammad and Turney (2013)

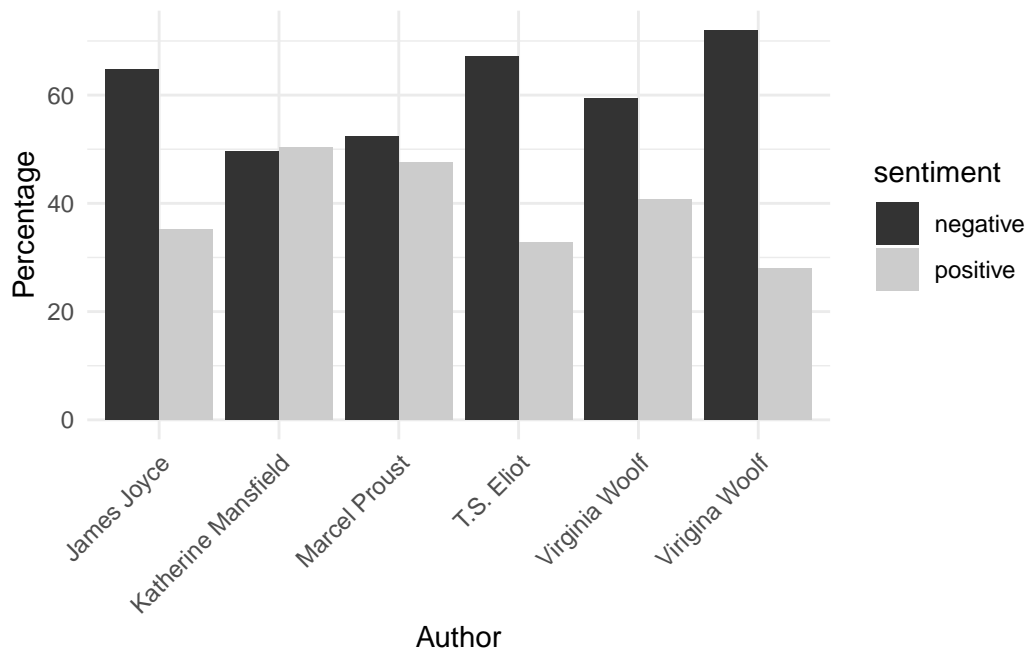


Figure 2: Sentiment Analysis of All Stream of Consciousness Books

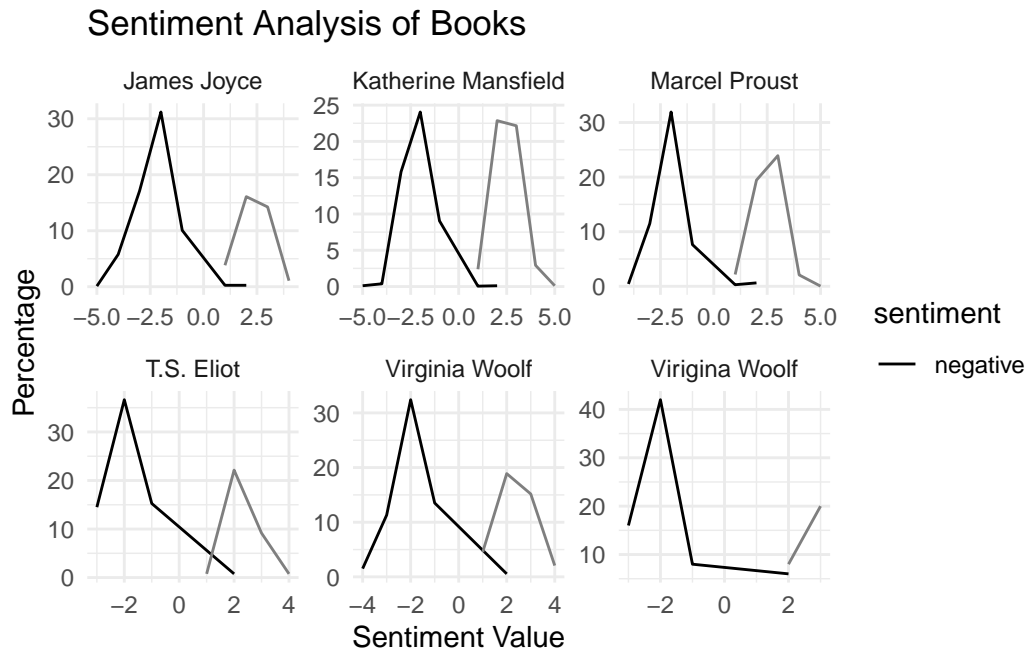


Figure 3: Sentiment Analysis of All Stream of Consciousness Books by Value

4.3 Gendered Mental Landscape of Stream of Consciousness Novels

4.3.1 Comparing Female Stream of Consciousness Authors

4.3.2 Comparing Male Stream of Consciousness Authors

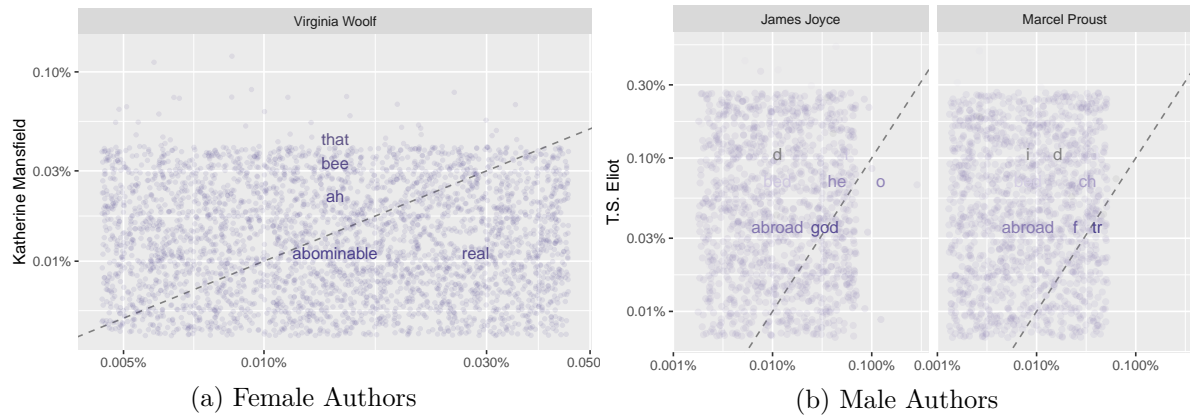


Figure 4: Comparative Analysis of Word Frequency in Female and Male Stream of Consciousness Authors

4.4 Transnational Stream of Consciousness Novels and Mental Health Themes

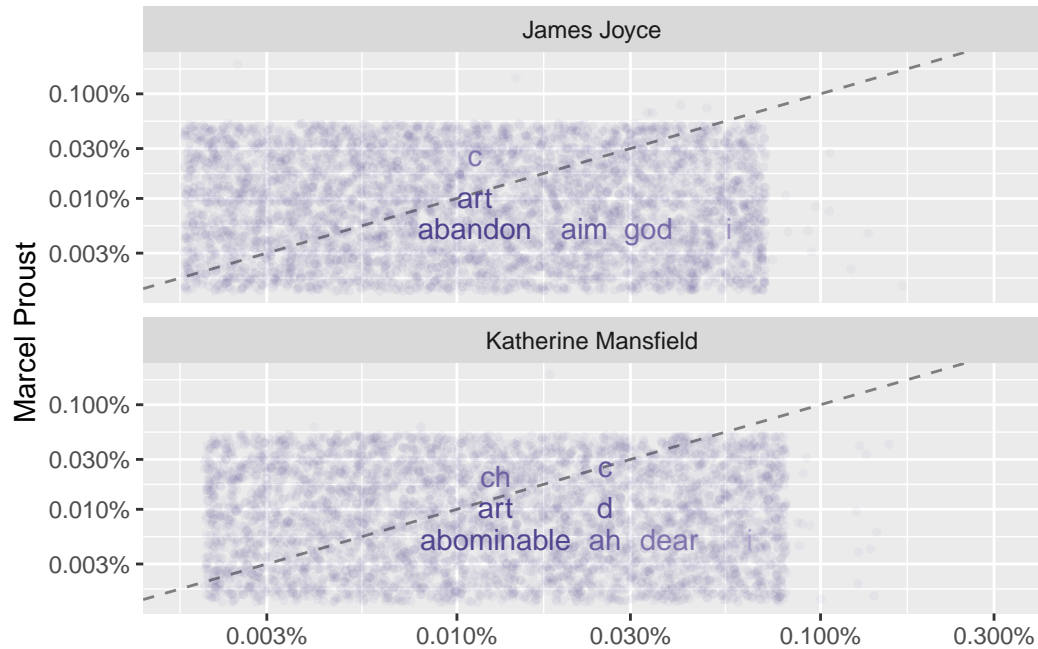


Figure 5: Comparative Analysis of Word Frequency in Transnational Stream of Consciousness Authors

4.5 Combined Texts: Trends, Word Networks, Bigram and Trigram Analysis

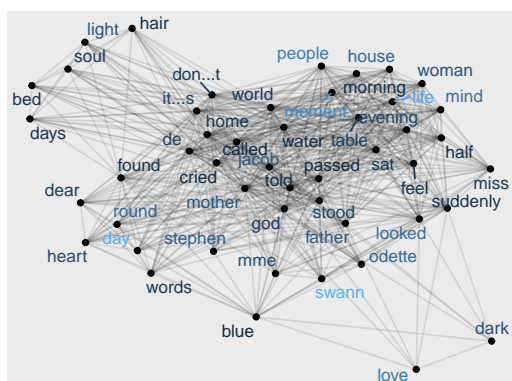
5 Discussion

5.1 Mental Health Vocabulary: Patterns and Trends

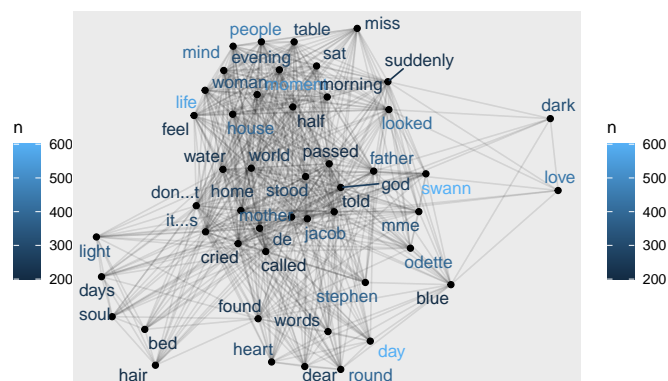
Discuss vocabulary patterns and word trends

5.2 Insights into Socio-Political Landscape of the West's Modernist Era

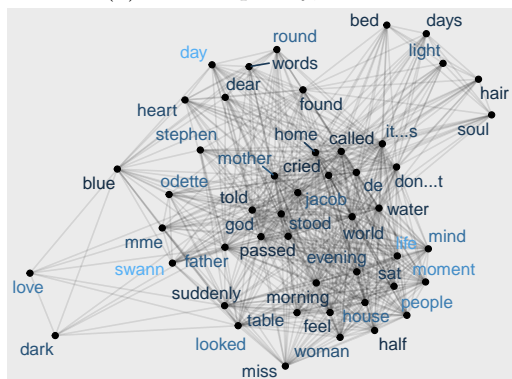
The novels' linguistic patterns reflect the socio-political landscape of the Western hemisphere, from late 19th century to the mid-20th century.



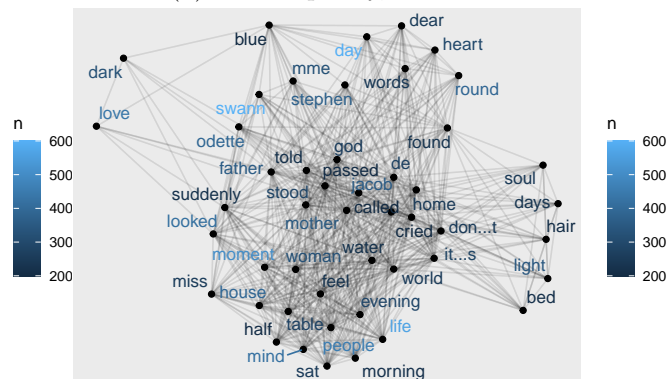
(a) 100 Frequency, 0.2 Correlation



(b) 200 Frequency, 0.4 Correlation



(c) 200 Frequency, 0.8 Correlation



(d) 400 Frequency, 1 Correlation

Figure 6: Word Networks Measured by Frequency and Correlation when Combining All Stream of Consciousness Novels

5.3 Schizophrenic and Disassociative Tendencies in Female Stream of Consciousness

5.4 Weaknesses

5.4.1 Lack of Thorough Word Cleaning

5.4.2 Limiting Literature Works and Publication Editions

5.4.3 Uneven Novel Length and Categorization of Authors

5.4.4 Project Gutenberg's Focus on the Canon

5.5 Moving Forward and Next Steps

6 Appendix

6.1 Additional Data Details

```
##| eval: true  
##| echo: false  
##| message: false  
##| warning: false  
#combined_books
```

6.1.1 Data Gathering

```
##| echo: false  
##| message: false  
##| label: tbl-reasons-strip-search  
##| tbl-cap:
```

6.1.2 Data Cleaning

```
##| echo: false  
##| message: false  
##| label: tbl-items-strip-search  
##| tbl-cap:
```

6.2 Model Details

6.3 Posterior predictive check

6.4 Diagnostics

References

- Allaire, J., Y. Xie, C. Dervieux, J. McPherson, J. Luraschi, K. Ushey, A. Atkins, et al. 2024. *Rmarkdown: Dynamic Documents for r*. R package version 2.26. <https://github.com/rstudio/rmarkdown>.
- Bernini, M., and C. Fernyhough. 2022. “Resampling (Narrative) Stream of Consciousness: Mind Wandering, Inner Speech, and Reading as Reversed Introspection.” *Modern Fiction Studies* 68 (4): 639–67. <https://doi.org/10.1353/mfs.2022.0045>.
- Feinerer, I., K. Hornik, and D. Meyer. 2008. “Text Mining Infrastructure in r.” *Journal of Statistical Software* 25 (5): 1–54. <https://doi.org/10.18637/jss.v025.i05>.
- Hvitfeldt, Emil. 2022. *Textdata: Download and Load Various Text Datasets*. <https://github.com/EmilHvitfeldt/textdata>.
- Johnston, Myfanwy, and David Robinson. 2023. *Gutenbergr: Download and Process Public Domain Works from Project Gutenberg*. <https://docs.ropensci.org/gutenbergr/>.
- Long, H., and J. So R. 2016. “Turbulent Flow: A Computational Model of World Literature.” *Modern Language Quarterly* 77 (3): 345–67. <https://doi.org/10.1215/00267929-3570656>.
- Mohammad, Saif M., and Peter D. Turney. 2013. “Crowdsourcing a Word-Emotion Association Lexicon.” *Computational Intelligence* 29 (3): 436–65. <https://doi.org/10.1111/j.1467-8640.2012.00460.x>.
- Müller, Kirill. 2020. *Here: A Simpler Way to Find Your Files*. <https://CRAN.R-project.org/package=here>.
- Nyongesa, A. 2023. “The Centre and Pathology: Postmodernist Reading of Madness in the Oppressor in Contemporary Fiction.” *Cogent Arts & Humanities* 10 (1): 1–12. <https://doi.org/10.1080/23311983.2023.2249280>.
- Pedersen, L., T. 2024. *Ggraph: An Implementation of Grammar of Graphics for Graphs and Networks*. <https://ggraph.data-imaginist.com>.
- “Project Gutenberg.” n.d. <https://www.gutenberg.org>.
- R Core Team. 2022. *R: A Language and Environment for Statistical Computing*. Vienna, Austria: R Foundation for Statistical Computing. <https://www.R-project.org/>.
- . 2023. *R: A Language and Environment for Statistical Computing*. Vienna, Austria: R Foundation for Statistical Computing. <https://www.R-project.org/>.
- Silge, J., and D. Robinson. 2006. “The Igraph Software Package for Complex Network Research.” *InterJournal, *Complex Systems**, 1695. <https://igraph.org>.
- . 2022. *Widyr: Widen, Process, Then Re-Tidy Data*. <https://github.com/juliasilge/widyr>.
- Silge, Julia, and David Robinson. 2016. “Tidytext: Text Mining and Analysis Using Tidy Data Principles in r.” *JOSS* 1 (3). <https://doi.org/10.21105/joss.00037>.
- Wickham, Hadley. 2016. *Ggplot2: Elegant Graphics for Data Analysis*. Springer-Verlag New York. <https://ggplot2.tidyverse.org>.
- Wickham, Hadley, Mara Averick, Jennifer Bryan, Winston Chang, Lucy D’Agostino McGowan, Romain François, Garrett Golemund, et al. 2019. “Welcome to the tidyverse.” *Journal*

- of Open Source Software* 4 (43): 1686. <https://doi.org/10.21105/joss.01686>.
- Wickham, Hadley, Romain François, Lionel Henry, and Kirill Müller. 2022. *Dplyr: A Grammar of Data Manipulation*. <https://CRAN.R-project.org/package=dplyr>.
- Wickham, Hadley, Thomas Lin Pedersen, and Dana Seidel. 2023. *Scales: Scale Functions for Visualization*. <https://scales.r-lib.org>.
- Xie, Yihui. 2014. “Knitr: A Comprehensive Tool for Reproducible Research in R.” In *Implementing Reproducible Computational Research*, edited by Victoria Stodden, Friedrich Leisch, and Roger D. Peng. Chapman; Hall/CRC. <http://www.crcpress.com/product/isbn/9781466561595>.