

THE CURIOSITY CUP 2025

A Global SAS[®] Student Competition

Leadership in Context: A Comparative Analysis of Rhetoric, Key Themes, and Sentiments in Philippine Presidential Speeches

ByteStorm

ABSTRACT

These studies collectively analyze Philippine presidential inaugural and State of the Nation Address (SONA) speeches from 1986 to the present, employing text mining and natural language processing (NLP) techniques. Across 46 speeches, the research explores the rhetoric, key themes, and sentiments prevalent in presidential discourse. Through unigram analysis, word association, topic modeling, and sentiment analysis, the studies reveal consistent emphasis on governance, legislative collaboration, and economic development, with recurring terms like "congress," "law," "economy," and "development." Key themes identified include governance and legislative priorities, socio-economic development and public welfare, national progress through infrastructure and investment, and national security. While presidential rhetoric generally conveys optimism and progress, it also acknowledges challenges related to governance, economic concerns, corruption, poverty, crime, and security. The analysis demonstrates how Philippine presidents utilize rhetoric as a leadership tool, reflecting and responding to historical, political, and socio-political contexts to shape governance narratives, reinforce political legitimacy, appeal to specific interest groups, foster national unity, and influence public perception and national discourse. The research contributes to a deeper understanding of political communication in the Philippines and the broader implications of presidential rhetoric in governance and public persuasion.

INTRODUCTION

Speech is a powerful leadership tool that shapes public perception and influences governance (Ivana & Suprayogi, 2020). In presidential leadership, speeches serve as strategic instruments for communicating policy direction and ideological positions (Eshbaugh-Soha, 2010; Olusola, 2020). They function as political tools, shaping public engagement and agenda-setting (Arellano et al., 2025). Among these, the Inaugural Address and the State of the Nation Address (SONA) stand out. The inaugural speech sets the tone for a leader's term, outlining priorities and shaping expectations, while the SONA serves as an annual assessment of governance, addressing accomplishments and policy directions (Biria & Mohammadi, 2012; Dabu, 2024).

In the Philippines, where political, social, and economic challenges persist, presidential speeches play a crucial role in shaping public discourse and policy trust (Ancho et al., 2020). However, despite their significance, limited research has analyzed the sentiments and topics expressed in SONA (Miranda et al., 2021), as well as the inaugural speeches. This study aims to fill this gap by examining the rhetorical strategies, recurring themes, and underlying sentiments in the inaugural and SONA speeches of Philippine presidents from 1986 to the present. Specifically, it will analyze the speeches of: (1) Corazon Aquino; (2) Fidel Ramos; (3) Joseph Estrada; (4) Gloria Macapagal Arroyo, (5) Benigno Aquino III; (6) Rodrigo Duterte; and (7) Bongbong Marcos. Using text mining

techniques such as unigram analysis, topic modeling, word association, and sentiment analysis, this research aims to uncover patterns in presidential rhetoric.

DATA <HEADING 1>

SOURCES <HEADING 2>

The dataset consists of Philippine presidential inaugural and State of the Nation Address (SONA) speeches from 1986 to the present. These speeches were obtained from official government archives, such as the Official Gazette of the Republic of the Philippines, the Presidential Communications Office, and reputable news sites that publish full transcripts of presidential addresses.

FORMAT AND SIZE <HEADING 2>

The dataset is structured to include the following columns:

- **President:** Name of the president who delivered the speech.
- **Term:** The years in office.
- **Inauguration Speech:** The full text of the inaugural address.
- **SONA Speeches:** The full text of each State of the Nation Address (SONA), organized by year within the president's term (e.g., *1st SONA Speech, 2nd SONA Speech, ..., 9th SONA Speech*).

Each speech is stored as textual data from the sources without any preprocessing. The dataset includes a total of 46 speeches, comprising all inaugural addresses and SONAs.

PROBLEM <HEADING 1>

Presidential speeches play a crucial role in shaping public perception, influencing policy direction, and reinforcing political legitimacy. Despite their significance, there is limited empirical analysis of how Philippine presidents use rhetoric over time. While political discourse is widely studied, few works apply quantitative text-mining techniques to systematically examine themes, sentiments, and language strategies in presidential addresses.

This study aims to analyze key themes, rhetorical patterns, and sentiment trends in Philippine presidential speeches from 1986 to the present. Using SAS for text mining, we seek to answer:

1. What rhetorical strategies are used in these speeches?
2. What recurring themes and key topics emerge across administrations?
3. How do the speeches reflect the socio-political context of each era and demonstrate measurable progress in the Philippines?

By analyzing recurring themes and sentiment shifts, this study promotes transparency, helps leaders craft more effective public communication, and informs policy development. It empowers citizens to critically assess governance narratives, fostering a more accountable and responsive government.

DATA CLEANING AND VALIDATION <HEADING 1>

The dataset, consisting of inaugural addresses and State of the Nation Addresses (SONAs) of Philippine presidents from 1986 onward, underwent extensive cleaning and validation using RStudio and SAS Studio. In RStudio, preprocessing involved lemmatizing words with `lemmatize_strings()`, tokenizing text using `tokenize_words()`, and structuring the dataset into a corpus with `VCorpus()`. A custom function standardized the text by converting it to lowercase, removing stopwords (English and Filipino), punctuation, numbers, special characters, excess whitespace, and URLs. The refined text was then structured into a Term-Document Matrix (TDM) and Document-Term Matrix (DTM) for advanced analysis like topic modeling and sentiment analysis.

In SAS Studio, additional cleaning steps were performed, including converting text to lowercase, stripping punctuation and numerical values, and removing extra spaces with `COMPBL`. The dataset was further tokenized, and a comprehensive stopword list was applied to eliminate non-contributory terms such as pronouns, conjunctions, and filler phrases. After filtering, the cleaned dataset contained 11,157 words, which were manually reviewed to ensure no meaningful content was lost. This combined approach in RStudio and SAS Studio ensures a high-quality dataset, enabling in-depth exploration of rhetorical strategies, key themes, and sentiment trends in Philippine presidential speeches.

ANALYSIS <HEADING 1>

UNIGRAM ANALYSIS <HEADING 2>

The unigram analysis of Philippine presidential speeches reveals key thematic priorities based on word frequency. The most frequently occurring words, such as *congress*, *national*, and *development*, indicate a strong emphasis on governance, legislative collaboration, and national progress. The prominence of *law* and *economy* suggests that legal and economic issues are central to presidential rhetoric, aligning with efforts to address policy frameworks and economic stability. Additionally, *program* and *act* highlight the executive branch's role in policy implementation, while words like *growth*, *peace*, and *reform* reflect ongoing discussions on socio-economic advancement and structural change.

WORD ASSOCIATION <HEADING 2>

Word association analysis further explores the relationships among key terms in presidential speeches. Strong connections between *program*, *law*, and *congress* reinforce the legislative and administrative focus of these addresses. Associations between *development*, *reform*, and *economy* suggest a thematic emphasis on socio-economic progress, while linkages involving *service* and *powerpoint* to recurring discussions about governance and infrastructure improvements. These associations illustrate how presidential rhetoric consistently aligns with national development priorities and policy initiatives.

TOPIC MODELING <HEADING 2>

Topic modeling identifies distinct thematic areas in presidential speeches. One major theme focuses on legislative and governance priorities, where terms like *peso*, *program*, and *congress* highlight economic stability and policymaking efforts. Another theme centers on socio-economic development and public welfare, as indicated by words such as *law*, *drug*, and *fight*, reflecting discussions on legal reforms and social issues. A third theme relates to national development and infrastructure, with words like *investment*, *build*, and *development* pointing to modernization efforts. These topics collectively underscore Philippine presidents' focus on governance, socio-economic progress, and nation-building through strategic reforms.

SENTIMENT ANALYSIS <HEADING 2>

Sentiment analysis evaluates the emotional tone of presidential speeches by categorizing words into positive, negative, and neutral sentiments. Positive words such as win, reform, promise, and freedom highlight themes of success and progress. Negative words like poor, problem, corrupt, and suffer reflect concerns over economic struggles, governance issues, and national challenges. Words with mixed sentiment, such as issue and concern, indicate discussions with varying contextual meanings. This analysis demonstrates how presidential rhetoric balances optimism with acknowledgment of national challenges, shaping public discourse on governance and development.

(All visualizations supporting this analysis are provided in the appendix.)

SUGGESTIONS FOR FUTURE STUDIES <HEADING 1>

Future research could explore how social media influences the reception of presidential speeches, examining the interaction between digital discourse and traditional speechmaking. Comparative studies with other nations facing similar challenges may reveal how cultural differences shape leadership communication. Another angle is gender in presidential rhetoric—how themes, public perception, and leadership styles differ between male and female leaders. Additionally, text mining and machine learning could track shifts in public sentiment over time, offering insights into the impact of rhetoric. Finally, studying the real-world effects of speeches on policy implementation and public trust could assess the effectiveness of presidential communication.

CONCLUSION

Philippine presidential speeches after the people power in 1986, as revealed through these studies, are carefully crafted instruments of leadership. Presidents strategically employ rhetoric to shape narratives, influence public perception, and communicate national priorities, reinforcing their authority and justifying policy directions. Recurring themes like governance, economic development, and national progress consistently emerge, reflecting long-term national goals and the evolving socio-political landscape, though specific priorities shift with each era. A key aspect of presidential communication is the balancing of optimism about progress and unity with acknowledgements of persistent challenges such as economic struggles, security concerns, and governance issues. This nuanced approach aims to inspire confidence while addressing public anxieties. Critically, presidential rhetoric is not static; it's deeply intertwined with the socio-political context of each administration, adapting to prevailing economic conditions, security threats, and public sentiment. These studies underscore the need for further research, including analyses of speeches in local languages, broader ranges of presidential communication, the impact of social media, comparative studies with other nations, and investigations into the long-term effects of presidential rhetoric on public sentiment and policy outcomes.

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RECOMMENDED READING

- *Base SAS® Procedures Guide*
- *SAS® For Dummies®*

APPENDIX

APPENDIX A: SAS CODE FOR UNIGRAM ANALYSIS AND SENTIMENT ANALYSIS <HEADING 2>

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CODE
LOG
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47 'and', 'having', 'let', 'does', 'did', 'doing', 'is', 'not', 'the', 'and', 'but', 'if', 'in', 'because',
48 'at', 'by', 'for', 'with', 'about', 'against', 'between', 'into', 'through', 'during', 'before', 'after
49 'from', 'up', 'down', 'in', 'out', 'on', 'off', 'over', 'under', 'again', 'further', 'then', 'once', 'h
50 'why', 'how', 'all', 'any', 'both', 'each', 'few', 'more', 'most', 'other', 'some', 'such', 'no', 'nor'
51 'so', 'than', 'too', 'very', 's', 't', 'can', 'could', 'now', 'as', 'may', 'also', 'tough', 'up', 'me',
52 'go', 'th', 'p', 'i', 'cannot', 'no', 'percent', 'philippine', 'year', 'years', 'million', 'billion',
53
54 );
55
56 RUN;
57
58 /* ----- FREQUENCY & UNIGRAM ANALYSIS ----- */
59
60 PROC SQL;
61 CREATE TABLE TERM_FREQUENCY AS
62 SELECT WORD, COUNT(*) AS FREQUENCY
63 FROM FILTERED_SPEECHES
64 GROUP BY WORD;
65 ORDER BY FREQUENCY DESC;
66 QUIT;
67
68 PROC PRINT DATA=TERM_FREQUENCY (OBS=15);
69 TITLE "Top 15 Most Frequent Words";
70 RUN;
71
72 /* ----- SENTIMENT ANALYSIS ----- */
73
74 DATA SENTIMENT_DICTIONARY;
75 INPUT WORD $ SENTIMENT $;
76 DATALINES;
77 work Positive
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Display 1. Unigram Analysis and Sentiment Analysis Code (Part 1)

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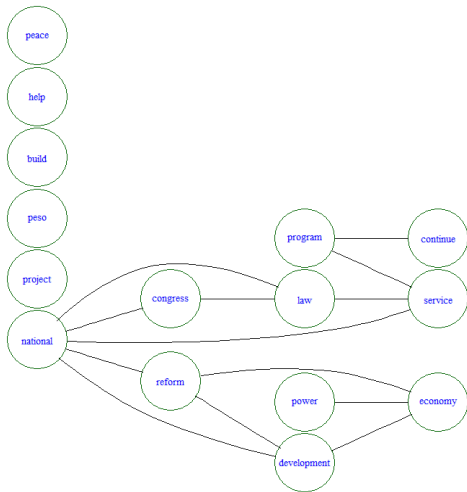


Figure 2. Word Association

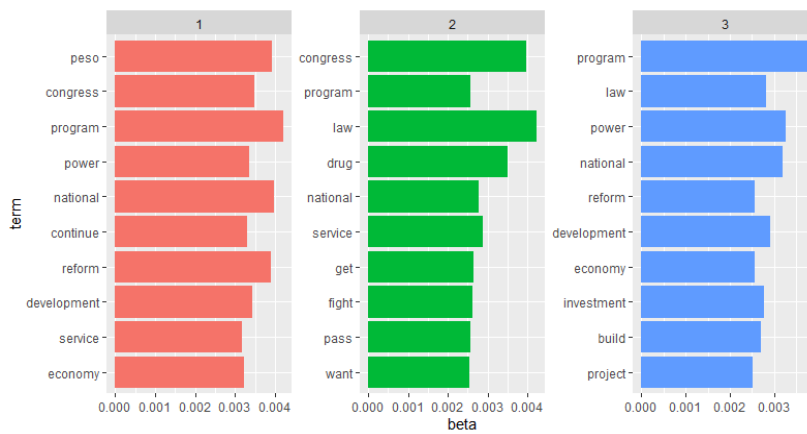


Figure 3. Topic Modeling

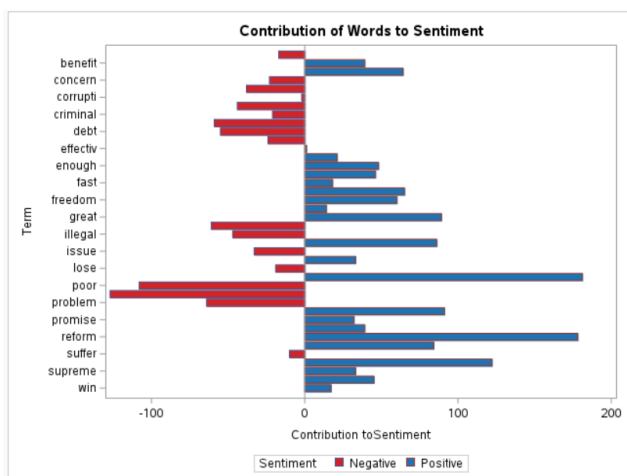


Figure 4. Sentiment Analysis