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QUANTIFYING POWER DISTANCE IN U.S. PRESIDENTIAL INAUGURAL SPEECHES: AN NLP APPROACH

This study analyzes power distance evolution in American presidential rhetoric through computational analysis of inaugural addresses (1789−2025). Integrating Hofstede's power distance framework with institutional isomorphism theory, it develops a Power Distance Index to examine 60 inaugural speeches using NLTK corpus and NLP techniques. The findings reveal three patterns: PDI fluctuates significantly during national crises, from the early republic through the Trump's 2025 address; contemporary rhetoric (2000−2025) displays unprecedented complexity in combining unity language with power indicators; and presidential authority construction has fundamentally evolved to adapt to modern political polarization. The analysis demonstrates that while presidential rhetoric trends toward egalitarian expression, this progression is nonlinear, reflecting complex adaptations to changing socio-political contexts and increasing institutional challenges.

Keywords: *power distance, U.S. presidential inaugural speeches, NLP*

1. Introduction

Presidential communication, particularly through public addresses, represents a critical element in understanding how political authority and institutional power are constructed and maintained in American political. As Campbell and Jamieson (2008) demonstrate, presidential speeches serve as more than ceremonial occasions;

they actively shape the relationship between the executive office and citizenry while establishing precedents for future institutional communication. This institutional dynamic operates within what Hofstede (1984) identifies as power distance frameworks, where communication patterns reflect and reinforce institutional hierarchies.

As the U. S. presidents adapt their communication strategies to changing social and political trends, their rhetorical evolution reveals deeper transformations. DiMaggio and Powell's (1983) institutional isomorphism theory helps explain this phenomenon, particularly during examining how different presidents, despite their individual styles, often adopt similar communication patterns under institutional pressures. While Grimmer and Stewart (2013) highlight the promise of automated content analysis methods for political texts, they also note significant methodological challenges in capturing institutional authority dynamics. This analytical complexity is particularly seen in contemporary political communication, where Bail et al. (2018) demonstrate how exposure to political messages can intensify polarization, and Schoonvelde et al. (2019) reveal systematic differences in communication complexity between ideological positions.

Drawing on these insights, this study explores three critical questions about presidential communication. Most fundamentally, how the expression of power in presidential discourse has evolved from Washington's era to Trump's second term. This investigation requires developing new computational tools to measure how presidents signal their authority through language. Besides, how presidents adapt their rhetorical strategies to maintain legitimacy while responding to changing social expectations is also explored.

2. Theoretical Framework & Literature Review

2.1 Theoretical Foundations

Hofstede's (1984) conceptualization of power distance is the primary theoretical framework for analyzing institutional communication patterns. This

framework has been extended by Khatri (2009), who demonstrates how power distance orientation influences organizational communication patterns and leadership effectiveness. The application of power distance concepts to political discourse offers crucial insights into how authority relationships are expressed and maintained through communication.

The evolution of presidential communication patterns finds its theoretical grounding in DiMaggio and Powell's (1983) institutional isomorphism theory. Their work illuminates how political institutions maintain legitimacy while adapting their communication practices, offering valuable insights into "the politics and ceremony that pervade much modern organizational life". This framework proves particularly relevant when examining the persistence of certain rhetorical traditions alongside evolving communication practices in presidential discourse.

Building on this foundation, Cornelissen et al. (2015) bridged a critical gap by placing communication at the heart of institutional analysis. Their approach reveals how presidential rhetoric navigates the delicate balance between preserving institutional authority and responding to shifting social dynamics.

2.2 Previous Studies

The systematic study of presidential language traces back to Hart's (1987) seminal research on leadership communication. Contemporary scholarship has since expanded this field considerably. Ahmadian et al. (2017) broke new ground with their analysis of Donald Trump's distinctive communication style, documenting patterns in "grandiosity ratings, use of first-person pronouns, greater pitch dynamics, and informal communication". Benoit's (2019) examination of visual and verbal symbolism in campaign communications complemented this work, and Bonikowski and Gidron (2016) documented the transformation of populist elements in American presidential discourse.

In the 21st century, computational approaches have revolutionized political

text analysis. As Young and Soroka (2012) pioneered approaches to automated sentiment analysis in political texts, researches in similar approaches followed. Recently, Grimmer et al. (2022) have provided a comprehensive framework for applying machine learning techniques to social science research. Nazeer et al. (2023) examines linguistic shifts in political discourse in the digital age, highlighting the importance of computational methods in understanding evolving communication patterns.

The application of computational methods to political communication analysis requires careful attention to methodological rigor. Denny and Spirling (2018) highlighted the importance of appropriate text preprocessing in unsupervised learning approaches, and Nelson et al. (2021) provided comparative analyses of different text analysis methodologies. These methodological considerations are crucial for ensuring reliable and valid analyses of presidential communication patterns.

3. Methodology

This study examines power distance in presidential inaugural addresses through computational linguistics and statistical analysis, utilizing Python-based tools to uncover patterns in presidential rhetoric.

3.1 Data and Processing

The analysis draws from the complete collection of presidential inaugural addresses, spanning from George Washington's 1789 speech to Donald Trump's 2025 address. These 60 speeches were assessed via Python's NLTK library, maintaining their chronological order and ensuring consistent formatting across all documents.

Text preparation began with careful normalization to preserve meaningful linguistic markers. While basic text processing relied on NLTK's word tokenize tool, we employed SpaCy's specialized language model for deeper linguistic

insights. Rather than filtering of common words, pronouns and institutional references crucial for understanding power dynamics were retained. The speeches and their metadata are stored in pandas DataFrames.

To measure power distance, a Power Distance Index (PDI) was designed, involving distinct language feature categories related to power distance. These categories capture various aspects of presidential rhetoric: expressions of power, hierarchy, centralization, collectivism, individualism, and both directive and participative language. The PDI calculation uses logarithmic scaling:

$$PDI = \ln(1 + \frac{H_p+1}{L_p+5}) \quad (1)$$

where *Hp* represents normalized high-power feature (power, hierarchy, centralization, directive) frequency and *Lp* represents low-power feature (participative, individualism) frequency per thousand words. The addition of base values (1 and 5 respectively) ensures numerical stability while maintaining sensitivity to power distance variations.

3.2 Design of the NLP Analysis

The analysis avoids the method of simple word counting by implementing dependency parsing to examine the contextual usage of power-related terms. This syntactic analysis verifies whether power words appear in grammatically significant positions, such as subjects or objects, providing a more subtle understanding of their rhetorical impact. Raw word counts undergo several normalization steps: first converting to per-thousand-word frequencies to account for varying speech lengths, then applying logarithmic transformation to manage extreme values, and finally implementing a three-year moving average to reveal underlying trends while smoothing individual variations. Each feature goes through a min-max normalization to enable meaningful comparisons across different speeches and time periods. The analysis also captures power contexts by examining grammatical relationships, particularly focusing on power-related terms that appear as subjects or objects in sentences.

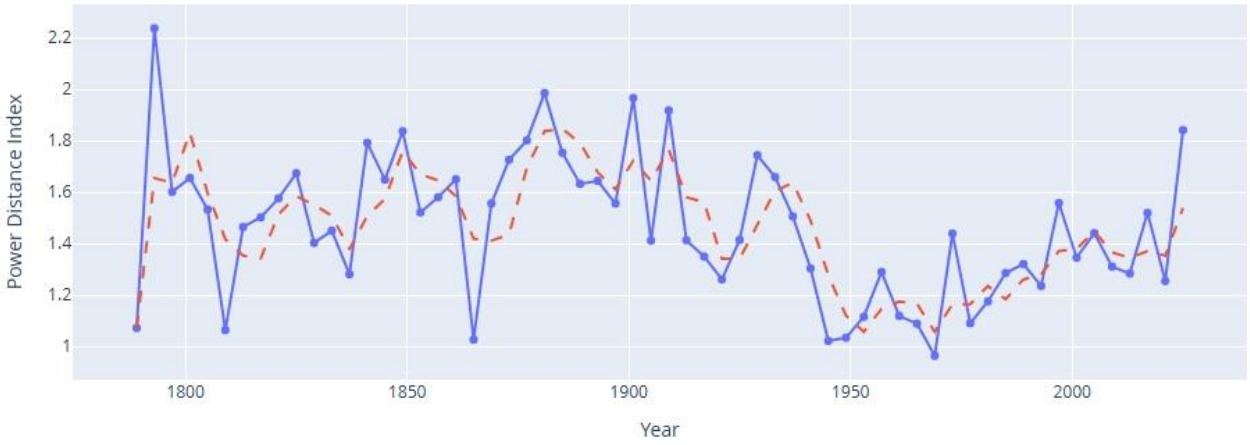
The visualization layer, built with Dash, transforms these analytical results into an interactive dashboard. We can explore temporal trends in power distance, compare PDI values across different presidencies, and examine relationships between various linguistic features.

4. Results and Discussion

4.1 Overall Power Distance Trends

The analysis of presidential inaugural addresses from 1789 to 2025 reveals significant fluctuations in power distance manifestation. The PDI data shows several notable patterns and critical moments. The most dramatic spike occurred in 1793, reaching a peak of 2.2. However, George Washington's second term speech was a very special one, containing only 135 words, clearly insufficient to be analysed with other inaugural addresses, and is therefore ignored in the result.

Figure 1



Power Distance Index over Time (dashed line for Moving Average)

Throughout the timeline, the PDI generally fluctuated between 1.2 and 1.8, with notable increases during periods of national crisis. Significant elevations are observed during the Civil War era (1850s), the Progressive Era (early 1900s), and the World War periods, where PDI values consistently reached or exceeded 1.6. The lowest points, with PDI values approaching 1.0, appeared in the mid-20th century, particularly during the post-World War II period of economic prosperity

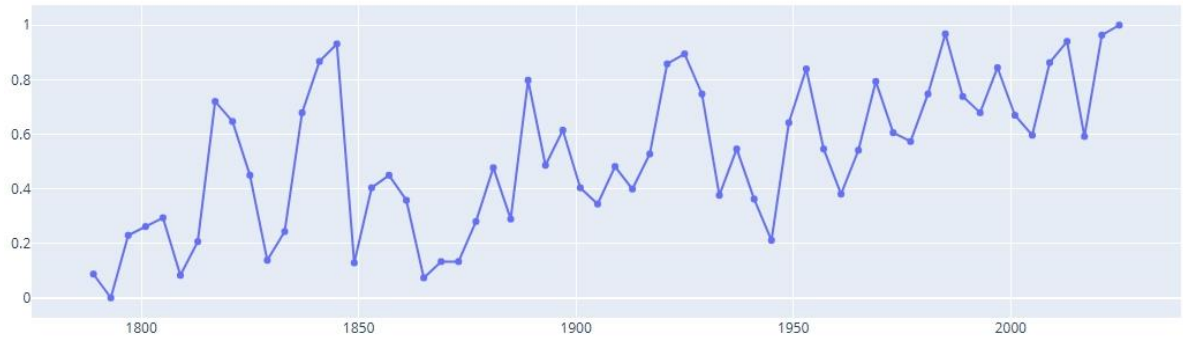
and relative social consensus of United States.

Recent decades (1980-2025) show a gradual but consistent upward trend from the historical lows of the mid-20th century, with increasing instability. Most notably, on Trump's second term (2025), the PDI shows a sharp increase to approximately 1.8, one of the highest values in recent decades. This change is particularly significant as it approaches levels last seen in the early 20th century, suggesting a shift toward more hierarchical rhetorical patterns. This recent surge indicates the intensifying political polarization, institutional challenges, and changing dynamics of presidential communication in contemporary American political system.

4.2 Key Rhetorical Patterns and Historical Context

The most significant pattern across all rhetorical dimensions emerges in the use of unity-related language, which shows a remarkable upward trajectory from 1800 to 2025. This trend becomes particularly obvious in recent decades, with values consistently reaching between 0.8 and 1.0 since the beginning of the 21st century. This sustained emphasis on unity language reflects the increasingly central role of national cohesion in U.S. presidential rhetoric, especially in the process of growing political polarization.

Figure 2

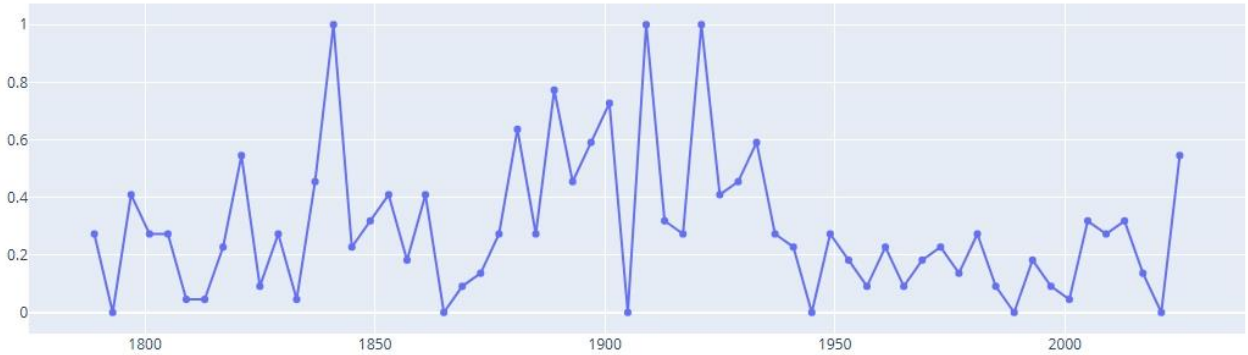


Unity Expressions (Normalized) over Time

Directive language presents another notable pattern, characterized by significant spikes during crucial historical moments. The most prominent peaks appear during the 1840s and early 1900s, periods marked by profound national

transformation (Civil War, WWI, Great Depression). The recent surge in directive rhetoric (2025) mirrors these historical patterns, suggesting Trump's return to more assertive presidential communication during times of national challenge.

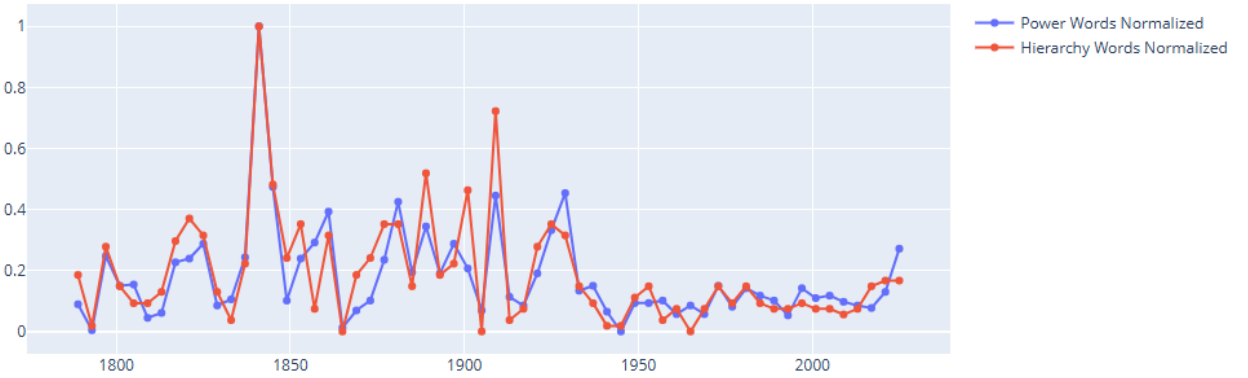
Figure 3



Directive Expressions (Normalized) over Time

The relationship between power and hierarchy language reveals a particularly interesting historical narrative, presenting almost the same trend. Both categories show their most dramatic peak around 1840, coinciding with pre-Civil War tensions. Following this peak, both generally trend downward in modern times. This pattern suggests a broader shift away from overt authority-based rhetoric.

Figure 4



Power and Hierarchy Words (Normalized) over Time

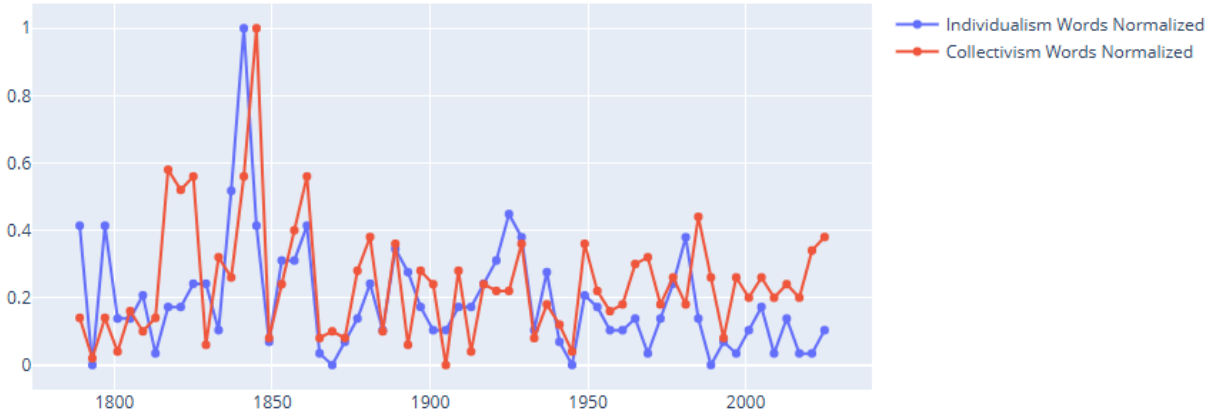
4.3 Contemporary Implications

The most recent period (2000-2025) shows interesting developments in power distance expression. While the overall PDI maintained relatively low levels compared to historical averages through the early 2000s, there has been increased

fluctuations in specific components, culminating in the significant PDI rise during Trump's second term. This upward trend coincides with unprecedented levels of unity language, while power and hierarchy indicators show consistent elevation rather than periodic spikes, reflecting what Tulis (2017) describes as the rhetorical presidency's adaptation to modern political polarization.

The individualism-collectivism balance shows increasing complexity in recent inaugural addresses, with presidents attempting to bridge traditional American individualism with calls for collective action on global challenges.

Figure 5



Individualism and Collectivism Words (Normalized) over Time

These findings suggest that while American presidential rhetoric has generally moved toward more egalitarian expressions, the pattern is neither linear nor uniform. Instead, it reflects complex adaptations to changing social, political, and technological contexts, supporting theoretical frameworks about the dynamic nature of political communication (Coe & Neumann, 2011).

4.4 Discussion on Power Distance Reflected in Biden 2021 and Trump 2025 Inaugural Speeches

The contrast between Biden's 2021 and Trump's 2025 inaugural addresses reveals the evolving nature of presidential authority. Their different approaches to power, not only in word choice but in the fundamental conception of leadership itself, reflect deeper tensions in how modern presidents navigate their relationship with the public.

The most significant contrast lies in how each president frames their relationship with power. Trump's return to the presidency in 2025 was featured by even more obvious assertion of executive authority than in his first term, making promises in strong personal decision style language – "*I will sign a series of historic executive orders […] I will declare a national emergency at our Southern border […] I will end the practice of catch and release […] I will send troops to the southern border to repel the disastrous invasion of our country*." (White House, 2025). This emphasis on presidential primacy stands in sharp contrast to historical precedent – even strong presidents like Franklin Roosevelt, during the Great Depression, typically framed their authority as derived from the people rather than inherent in their own hands. Biden's 2021 speech, conversely, distributes power across multiple people, emphasizing that "The American story depends not on any one of us, not on some of us, but on all of us, on 'We the People,'" (NPR, 2021) actively minimizing the perceived gap between leader and citizens.

Their approaches to policy implementation and opposition further highlight these differences. Trump outlines unilateral actions and establishes new power structures, reinforcing high power distance through top-down governance. Biden emphasizes collective problem-solving, stating that "unity is the path forward" and "we're going to need each other" (NPR, 2021). Another difference lies in their attitudes towards non-supporters. Trump maintains clear boundaries between supporters and opponents, Biden actively tries to bridge divides, directly addressing non-supporters: "*To all those who did not support us, let me say this: Hear me out.*" (NPR, 2021).

The sources of legitimacy in each speech reflect their power distance orientations. Trump draws authority from divine intervention, historical greatness, and personal mandate, featuring vertical power structures. Biden's legitimacy claims rest on democratic processes, constitutional tradition, and collective will, reflecting a lower power distance approach.

Linguistically, Trump's address features frequent use of "*I will*," declarative

statements, and direct commands, emphasizing presidential authority. Biden's speech, however, is characterized by the frequent use of "*we*" instead of "*I*" conditional statements, and invitational language, trying to minimize power differences. These choices reveal fundamentally different understandings of presidential power – Trump's vision of strong, decisive executive leadership against Biden's model of collaborative governance.

5. Conclusion

This analysis of presidential inaugural addresses from 1789 to 2025 reveals three significant patterns in the manifestation of power distance in American presidential rhetoric. First, the Power Distance Index (PDI) shows notable fluctuations corresponding to periods of national crisis, with dramatic spikes during the Civil War era, World Wars, and most recently in Trump's 2025 address. Second, contemporary presidential rhetoric (2000−2025) shows increasing complexity in power distance expression, characterized by unprecedented combinations of high unity language with elevated power indicators, particularly seen in the contrasting approaches of Biden (2021) and Trump (2025). Third, the research identifies a fundamental evolution in how presidential authority is constructed and communicated, supporting Tulis's (2017) observations about the rhetorical presidency's adaptation to modern political polarization.

Several limitations should be noted in this study. The analysis relies on inaugural addresses, which may not fully capture the breadth of presidential communication. Additionally, the interpretation of power distance indicators across different historical contexts may be influenced by changing cultural norms and societal values that are not fully considered in the textual analysis. However, this approach can be seen as an attempt to quantify rhetoric features, which can be improved and applied to a variety of area studies, finding more connections between language and characters.

REFERENCES

1. Ahmadian, S., Azarshahi, S., & Paulhus, D. L. (2017). Explaining Donald Trump via communication style: Grandiosity, informality, and dynamism. *Personality and Individual Differences, 107*, 49−53.
2. Bail et al. (2018). Exposure to opposing views on social media can increase political polarization. *Proceedings of the National Academy of Sciences, 115(37),* 9216−9221.
3. Benoit, W. L. (2019). A functional analysis of visual and verbal symbols in presidential campaign posters, 1828–2012. *Presidential Studies Quarterly, 49(1),* 4−22.
4. Bonikowski, B., & Gidron, N. (2016). The populist style in American politics: Presidential campaign discourse, 1952–1996. *Social Forces, 94(4),* 1593−1621.
5. Campbell, K. K., & Jamieson, K. H. (2008). *Presidents creating the presidency: Deeds done in words*. University of Chicago Press.
6. Coe, K., & Neumann, R. (2011). The major addresses of modern presidents: Parameters of a data set. *Presidential Studies Quarterly, 41(4),* 727−751.
7. Cornelissen, J. P., Durand, R., Fiss, P. C., Lammers, J. C., & Vaara, E. (2015). Putting communication front and center in institutional theory and analysis. *Academy of Management Review, 40(1),* 10−27.
8. Denny, M. J., & Spirling, A. (2018). Text preprocessing for unsupervised learning: Why it matters, when it misleads, and what to do about it. *Political analysis, 26(2),* 168-189.
9. DiMaggio, P. J., & Powell, W. W. (1983). The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields. *American Sociological Review, 48(2),* 147−160.
10. Edwards III, G. C. (2009). *The strategic president: Persuasion and opportunity in presidential leadership. In The Strategic President*. Princeton University Press.
11. Grimmer, J., & Stewart, B. M. (2013). Text as data: The promise and pitfalls of automatic content analysis methods for political texts. *Political Analysis, 21(3),* 267−297.
12. Grimmer, J., Roberts, M. E., & Stewart, B. M. (2022). *Text as data: A new framework for machine learning and the social sciences*. Princeton University Press.
13. Hart, R. P. (1987). *The sound of leadership: Presidential communication in the modern age*. University of Chicago Press.
14. Hofstede, G. (1984). *Culture's consequences: International differences in work-related values*. Sage Publications.
15. Hofstede, G. (2001). *Culture's Consequences: Comparing Values, Behaviors, Institutions, and Organizations Across Nations* (2nd ed.). Sage Publications.
16. Khatri, N. (2009). *Consequences of power distance orientation in organisations*. Vision, 13(1), 1−9.
17. Nazeer, I., Yousaf, S., & Anwar, N. (2023). Analyzing linguistic shifts in political discourse: A corpus-based study of political rhetoric in the digital age. *Pakistan Journal of Humanities and Social Sciences, 11(4),* 3924−3933.
18. Nelson, Laura K., et al. (2021). The future of coding: A comparison of hand-coding and three types of computer-assisted text analysis methods. *Sociological Methods & Research, 50.1,* 202−237.
19. NPR. (2021). 'This is America's day': Biden's inaugural address, annotated. NPR. https://www.npr.org/2021/01/20/956922884/bidens-inaugural-address-annotated
20. Schoonvelde, M., Brosius, A., Schumacher, G., & Bakker, B. N. (2019). Liberals lecture, conservatives communicate: Analyzing complexity and ideology in 381,609 political speeches. *PloS one, 14(2),* e0208450.
21. Tulis, J. K. (2017). *The Rhetorical Presidency* (2nd ed.). Princeton University Press.
22. The White House. (2025). *The inaugural address. The White House Briefing Room*. https://www.whitehouse.gov/remarks/2025/01/the-inaugural-address/
23. Young, L., & Soroka, S. (2012). Affective news: The automated coding of sentiment in political texts. *Political Communication*, 29(2), 205−231.

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自然语言处理方法量化美国总统就职演说中的权力距离

本研究通过对美国总统就职演说（1789-2025 年）的计算机分析，探究了总统演说中权力距离的演变。研究整合了霍夫斯泰德权力距离理论框架与制度同构理论，运用 NLTK 语料库和自然语言处理技术，建立权力距离指数对 60 篇就职演说进行分析。研究发现呈现三种模式：从美国建国初期到特朗普 2025 年的演说，权力距离指数在国家危机期间出现显著波动；当代演说（2000-2025 年）在结合团结语言与权力指标方面表现出前所未有的复杂性；总统权威构 建方式已经发生根本性演变，以适应现代政治极化。分析表明，尽管总统演 说呈现出平等主义表达的趋势，但这一进程并非线性发展，反映了对不断变 化的社会政治环境和日益增加的制度性挑战的复杂适应。

关键词：*权力距离，美国总统就职演说，自然语言处理*

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文学作品的地域文化表现——以《金上京史话》为例

本文综合运用考古遗存、女真语言遗存（如“按出虎水”）、民俗符号（如祭天射柳、头鱼宴等），以及都城空间布局中仿宋制却兼具女真特色的隐喻表达，同时挖掘地方传说、金代音乐等碎片化的文化信息，从多维度、