
Computable Structures of National Narratives: A Model for Generating Governance Legitimacy Based on Computational Content Analysis, Emotional Mediation, and Semantic Networks

[Wei Meng](#) *

Posted Date: 2 January 2026

doi: 10.20944/preprints202601.0089.v1

Keywords: computational social science; text-as-data; semantic networks; affective mediation; causal inference; governance legitimacy; political narratives



Preprints.org is a free multidisciplinary platform providing preprint service that is dedicated to making early versions of research outputs permanently available and citable. Preprints posted at Preprints.org appear in Web of Science, Crossref, Google Scholar, Scilit, Europe PMC.

Copyright: This open access article is published under a [Creative Commons CC BY 4.0 license](#), which permit the free download, distribution, and reuse, provided that the author and preprint are cited in any reuse.

Disclaimer/Publisher's Note: The statements, opinions, and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions, or products referred to in the content.

Article

Computable Structures of National Narratives: A Model for Generating Governance Legitimacy Based on Computational Content Analysis, Emotional Mediation, and Semantic Networks

Wei Meng ^{1,2,3}

- ¹ Dhurakij Pundit University, Thailand
- ² The University of Western Australia, AU
- ³ Fellow, Royal Anthropological Institute, UK
- * Correspondence: weimeng4@acm.org

Abstract

This paper proposes the Computable Structure of National Narrative (CSNN) framework, treating state-level political texts as engineering-oriented governance systems. **Using President Xi Jinping's 2026 New Year Address as a case study**, it constructs a multi-level variable and causal pathway model encompassing ‘governance input—transformation mechanism—governance output’. The research integrates computational content analysis, sentiment analysis, and semantic network analysis to transform the text into a reproducible variable system: independent variables encompass development/innovation, people's livelihoods, culture, discipline, and external governance narratives; mediating variables include policy perceptibility, emotional resonance, and governance credibility; dependent variables are governance legitimacy and social cohesion; external uncertainty is introduced as a moderating factor. Results reveal: national narratives exhibit stable functional paragraph sequencing; sentiment is not an end-stage effect of communication but a key mediator in generating governance legitimacy; governance legitimacy displays structural output characteristics, dependent on the convergence of multiple mediating pathways. This study contributes a computable, interpretable, and transferable toolchain for political narrative research, providing a reproducible empirical framework for cross-year, cross-national, and multimodal expansion.

Keywords: computational social science; text-as-data; semantic networks; affective mediation; causal inference; governance legitimacy; political narratives

1. Introduction

Computational social science advances the study of social phenomena from ‘interpretive textual analysis’ to ‘computable evidence systems’, emphasising reproducible data structures, algorithms, and chains of inference (Lazer et al., 2009; Grimmer & Stewart, 2013). Within governance studies, legitimacy is often regarded as the core condition for institutional sustainability (Suchman, 1995), yet its generative mechanisms rely heavily on sustained meaning production and public communication. National-level political texts (such as New Year addresses) represent a highly institutionalised form of governance communication, characterised by periodicity, authority, and comprehensiveness. Consequently, they lend themselves well to modelling as ‘governance interfaces’. Existing research, however, either focuses on rhetorical and framing analysis (Entman, 1993; Fairclough, 1995), or on textual thematic statistics, lacking a reproducible framework that integrates narrative structure, affective mechanisms, and legitimacy outcomes within a single model (Grimmer et al., 2022). Accordingly, this paper poses the research question: Does the state narrative possess a stable,

computable structure? How is this structure transformed into governance legitimacy through affective and cognitive mediation?

2. Relevant Research and Theoretical Positioning

Within political communication studies, framing theory posits that texts influence audience interpretation by selecting and emphasising specific issue dimensions (Entman, 1993). Critical discourse analysis underscores the mutual construction of discourse and power/institutional structures (Fairclough, 1995). Research on affective politics demonstrates that emotions serve as core inputs for political judgements, influencing attention, evaluation, and behavioural tendencies (Marcus et al., 2000; Brader, 2006). Concurrently, ‘text as data’ research proposes structuring texts into computable features, while cautioning against interpretative drift arising from excessive automation (Grimmer & Stewart, 2013). This paper's theoretical positioning is to regard state-level narratives as the front-end interface of a governance system, identifying interpretable relationships between its structure, mechanisms, and outputs through computable methods.

3. CSNN Framework and Hypotheses

CSNN (Computable Structure of National Narrative) abstracts national narratives into three layers: the governance input layer (narrative elements), the transformation mechanism layer (emotional and cognitive mediation), and the governance output layer (legitimacy and cohesion). This framework emphasises structural stability, variable identifiability, and mechanism interpretability (Grimmer et al., 2022).

The hypotheses are as follows:

- H1: National narratives exhibit a stable functional sequence of structural paragraphs.
- H2: Emotion primarily functions as an intermediary mechanism rather than an end-effect of communication.
- H3: Governance legitimacy is generated through the superposition of multiple mediating pathways rather than as a linear function of performance (Suchman, 1995).

4. Data and Methods (Reproducible Toolchain)

The dataset comprises the full text of the 2026 New Year Address (Xinhua News Agency release version). The study employs a single-text, multi-scale design: paragraph-level analysis identifies functional structures, while sentence-level processing constructs semantic co-occurrence and sentiment intensity. To enhance reproducibility, this research adopts rule-based segmentation and encoding schemes, providing variable dictionaries and path definitions (Neuendorf, 2017) .

4.1. Computational Content Analysis

First, word segmentation and stop-word processing were performed. Subsequently, word frequency and TF-IDF keywords were calculated, with governance functions categorised through contextual analysis. Finally, semi-rule-based thematic aggregation was conducted under governance theory constraints to prevent interpretative drift caused by purely unsupervised clustering (Grimmer & Stewart, 2013).

4.2. Sentiment Analysis

Sentiment measurement employs dual-dimensional metrics of polarity (positive/negative) and intensity. Averages and fluctuations are calculated per functional paragraph to examine sentiment's structural positioning and influence. Theoretically, sentiment is regarded as both an input and mediating mechanism for political judgements (Marcus et al., 2000).

4.3. Semantic Network Analysis

Semantic networks are constructed based on intrasentential and inter-sentential co-occurrence, with nodes representing core concepts and edge weights reflecting co-occurrence frequency. Key conceptual hubs are identified using degree centrality and betweenness centrality (Carley, 1997).

4.4. Causal Path Modelling (Explanatory Approach)

This study adopts an explanatory causal modelling logic: guided by theory, we construct directional paths and test their consistency with textual evidence. Causal explanations follow a structured causal inference framework (Pearl, 2009), though parameter estimation is not conducted herein; this is reserved for subsequent cross-textual research.

5. Results

5.1. Structural Stability and Thematic Sequencing (Testing H1)

The textual themes exhibit a stable sequence: Performance Review → Historical Memory → Innovative Leap → Cultural Identity → Shared Livelihood → External Governance → Disciplinary Construction → Future Mobilisation. This sequence corresponds to the governance system's chain of 'Review–Justification–Meaning–Care–Order–Constraint–Mobilisation', supporting H1.

5.2. Structural Positioning and Mediating Role of Emotion (Testing H2)

Emotional intensity exhibits systematic configuration across functional paragraphs: performance segments predominantly feature affirmation and pride; historical segments introduce solemnity/caution; future mobilisation segments display marked positive elevation. This configuration indicates emotion functions not merely as stylistic device but as a mechanism for transforming policy narratives into identity and mobilisation (Marcus et al., 2000; Brader, 2006), supporting H2.

5.3. Multi-core Coupling Structure of the Semantic Network

The semantic network reveals 'development,' 'people,' 'governance,' and "innovation" as high-centrality nodes, forming a multi-core coupling structure. Cultural and livelihood concepts form an affect-identity subnetwork with 'people'; disciplinary concepts form a credibility subnetwork; and external governance concepts form an order subnetwork (Carley, 1997).

5.4. Multi-layered Variable System and Causal Pathways (Testing H3)

Independent variables (IV) comprise: development/innovation narratives, livelihood narratives, cultural narratives, discipline narratives, and external governance narratives. Mediating variables (M) include: policy perceptibility, emotional resonance, governance credibility, and national confidence (latent variables). Dependent variables (DV) are governance legitimacy and social cohesion. The model indicates no single pathway from 'narratives → legitimacy'; legitimacy emerges through multiple overlapping mediating pathways, consistent with the structural view of legitimacy (Suchman, 1995), supporting H3.

6. Discussion and Key Insights

Insight 1: National-level political texts may be understood as front-end interfaces of engineering-enabled governance systems rather than mere collections of rhetoric. This positioning advances political communication research from 'interpreting meaning' to 'modelling structures and mechanisms', aligning with computational social science traditions (Lazer et al., 2009; Grimmer et al., 2022).

Insight 2: Emotion is not an end-effect of communication but a necessary intermediary in legitimacy generation. This finding advances affective political theory from 'emotion influencing judgement' to

‘emotion as a governance mechanism,’ complementing institutionalised text research (Marcus et al., 2000).

Insight 3: Governance legitimacy is a structural product. Development/innovation narratives provide proof of capability, livelihood narratives offer perceptibility, disciplinary narratives confer credibility, and cultural narratives supply meaning; these elements combine through mediated pathways to generate legitimacy (Suchman, 1995).

Insight 4: A key function of state narratives is expectation management. Future-oriented mobilisation passages employ action metaphors and positive emotional elevation to anchor long-term direction and reduce uncertainty perception, embodying the ‘expectation anchoring’ attribute of institutional governance communication (Pierson, 2004).

Insight 5: The CSNN model possesses cross-textual transfer potential. Within the JCSS context, this model can be extended to compare narratives across years and nations, and further integrated with multimodal signals (audio, video) to form a more general computational social science narrative mechanism model (Grimmer et al., 2022).

7. Accessibility Statement

The data used in this study consists of publicly available texts and does not involve personal privacy. The dataset referenced herein has been published. Please consult the following publication details:

MENG, WEI, 2025, ‘Computable Structures of National Narratives: A Dataset for Generating Governance Legitimacy Models Based on Computational Content Analysis, Emotional Mediation, and Semantic Networks’, <https://doi.org/10.7910/DVN/CMIX7P>, Harvard Dataverse, V1, UNF:6:Jf3EaW+0CbiaygfCw0b9cA== [fileUNF]

8. Research Findings

This paper employs the Computable Structure of National Narrative (CSNN) as its core analytical framework to systematically examine whether state-level political texts exhibit stable structures, how these structures operate, and how they generate governance legitimacy through affective and cognitive mechanisms. Through computational content analysis, sentiment measurement, semantic network analysis, and interpretative causal path modelling of the 2026 New Year Address, the study reached the following conclusions, which align with the research hypotheses.

Conclusion I: National narratives possess stable, computable structural logic (supporting H1)

Regarding Hypothesis H1 (that state narratives exhibit stable functional paragraphs and structural sequencing), the analysis demonstrates that state-level political texts are not loosely assembled rhetorical collections but present highly consistent structural sequencing and functional division. Whether in thematic distribution, paragraph function, or the centrality structure of semantic networks, the texts reveal a clear chain of governance logic: Review of governance performance → Historical memory → Demonstration of capability (innovation/development) → Value and cultural identity → Tangible public welfare → External order → Disciplinary constraints → Future mobilisation.

This structure is not fortuitous but embodies the temporal self-narrative mode of state governance: through retrospective review, demonstrative validation, meaning-imbuing, and forward projection, it continuously constructs governance continuity and institutional stability. Consequently, H1 receives empirical support: state narratives may be regarded as a structurally stable, formally modelled type of governance text.

Conclusion 2: Emotion functions as a mechanism-level mediator within state narratives, not merely an end-effect (supporting H2)

Regarding Hypothesis H2 (that emotion primarily functions as a mediating mechanism within state narratives rather than a terminal effect of communication), this study employs paragraph-level sentiment analysis and structural alignment to reveal that emotion is not uniformly or randomly

distributed throughout the text. Instead, it is systematically deployed within specific governance-functional paragraphs: reinforcing affirmation and confidence in performance reviews; introducing solemnity and caution in historical and international discourse; and significantly elevating positive sentiment and action metaphors in future mobilisation.

More significantly, causal path analysis reveals that emotion does not manifest directly as a governance output. Instead, it is embedded within the transformative link between “narrative input → legitimacy output”, functioning alongside variables such as policy perceptibility and governance credibility to constitute a mediating mechanism. In other words, governance legitimacy is not directly generated by policy narratives; it must undergo a process of emotional and cognitive translation to achieve stable formation. Consequently, H2 is supported: emotion within state narratives should be understood as a governance mechanism variable rather than a communication effect variable.

Conclusion 3: Governance legitimacy is a structural product, not a linear outcome of performance narratives (supporting H3)

Regarding Hypothesis H3 (that governance legitimacy is structurally generated through multiple mediating pathways rather than as a linear function of performance), the multi-level variable system and causal pathway model constructed herein demonstrate that no single narrative element can directly and fully generate governance legitimacy. Instead, governance legitimacy arises from the convergence and synergy of multiple pathways:

Development and innovation narratives provide evidence of governance capacity; livelihood narratives enhance the individual perceptibility of policies; disciplinary narratives reinforce institutional credibility; cultural narratives supply values and meaning. Only when these elements are transformed through mediating variables such as emotional resonance, national confidence, and institutional identification can they collectively generate stable legitimacy outcomes.

This finding refutes the linear model reducing governance legitimacy to ‘performance × propaganda,’ indicating legitimacy should instead be understood as a structural governance outcome. Consequently, H3 is supported: governance legitimacy is not a function of a single variable but a systemic output embedded within the state narrative structure.

Synthesis of Findings and Theoretical Advancement

Synthesising the three conclusions above, this study demonstrates that state-level political narratives constitute a computable, interpretable, and transferable governance system. Its core function lies not in short-term persuasion or emotional mobilisation, but in continuously producing governance meaning, reaffirming legitimacy, and anchoring long-term social expectations through structured narratives and affective mechanisms.

Theoretically, this paper achieves three key advances through the CSNN framework:

First, it elevates political narratives from interpretive objects to modelable governance interfaces;

Second, it systematically incorporates affect into governance legitimacy generation mechanisms;

Third, it provides a reproducible integration pathway between governance studies and computational social science.

Methodologically, this study demonstrates that computational content analysis transcends descriptive statistics or predictive tasks, proving equally viable for explanatory, mechanism-oriented governance research. Practically, the framework exhibits potential for cross-year, cross-national, and cross-media extension, offering a foundational model for comparative politics, policy communication, and AI governance studies.

Limitations include: single-text case constraints on statistical generalisation; latent variables not yet linked to survey/behavioural data; causal pathways not parameterised. Future work will address: (1) cross-annual time-series comparisons; (2) cross-national institutional comparisons; (3) combining CSNN with structural equation modelling or Bayesian networks for parameter estimation (Bollen, 1989; Pearl, 2009).

References

- Bollen, K. A. (1989). Structural equations with latent variables. Wiley. <https://doi.org/10.1002/9781118619179>
- Brader, T. (2006). Campaigning for hearts and minds: How emotional appeals in political ads work. University of Chicago Press. <https://press.uchicago.edu/ucp/books/book/chicago/C/bo3613032.html>
- Carley, K. M. (1997). Network text analysis: The network position of concepts. In C. Roberts (Ed.), Text analysis for the social sciences (pp. 79–100). Lawrence Erlbaum. <https://doi.org/10.4324/9781410600628>
- Entman, R. M. (1993). Framing: Toward clarification of a fractured paradigm. *Journal of Communication*, 43(4), 51–58. <https://doi.org/10.1111/j.1460-2466.1993.tb01304.x>
- Fairclough, N. (1995). Critical discourse analysis. Longman. <https://www.routledge.com/Critical-Discourse-Analysis/Fairclough/p/book/9780582219847>
- Grimmer, J., & Stewart, B. M. (2013). Text as data: The promise and pitfalls of automatic content analysis. *Political Analysis*, 21(3), 267–297. <https://doi.org/10.1093/pan/mps028>
- 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. <https://press.princeton.edu/books/hardcover/9780691207551>
- Lazer, D., Pentland, A., Adamic, L., Aral, S., Barabási, A.-L., Brewer, D., Christakis, N., Contractor, N., Fowler, J., Gutmann, M., Jebara, T., King, G., Macy, M., Roy, D., & Van Alstyne, M. (2009). Computational social science. *Science*, 323(5915), 721–723. <https://doi.org/10.1126/science.1167742>
- Marcus, G. E., Neuman, W. R., & MacKuen, M. (2000). Affective intelligence and political judgment. University of Chicago Press. <https://press.uchicago.edu/ucp/books/book/chicago/A/bo3684025.html>
- MENG, WEI, 2025, "Computable Structures of National Narratives: A Dataset for Generating Governance Legitimacy Models Based on Computational Content Analysis, Emotional Mediation, and Semantic Networks", <https://doi.org/10.7910/DVN/CMIX7P>, Harvard Dataverse, V1, UNF:6:Jf3EaW+0CbiaygfCw0b9cA== [fileUNF]
- Neuendorf, K. A. (2017). The content analysis guidebook (2nd ed.). Sage. <https://us.sagepub.com/en-us/nam/the-content-analysis-guidebook/book258450>
- Pearl, J. (2009). Causality: Models, reasoning, and inference (2nd ed.). Cambridge University Press. <https://doi.org/10.1017/CBO9780511803161>
- Pierson, P. (2004). Politics in time: History, institutions, and social analysis. Princeton University Press. <https://press.princeton.edu/books/paperback/9780691128382>
- Suchman, M. C. (1995). Managing legitimacy: Strategic and institutional approaches. *Academy of Management Review*, 20(3), 571–610. <https://doi.org/10.5465/amr.1995.9508080331>
- Springer. (n.d.). Submission guidelines: Journal of Computational Social Science. <https://link.springer.com/journal/42001/submission-guidelines>
- Springer Nature. (n.d.). Data availability statements. <https://www.springernature.com/gp/authors/research-data-policy/data-availability-statements>
- Springer. (n.d.). Aims and scope: Journal of Computational Social Science. <https://link.springer.com/journal/42001/aims-and-scope>

Disclaimer/Publisher's Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.