

Government Expression and Public Interaction Mechanisms in Government New Media in the Era of Digital Intelligence

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Abstract

Digital-intelligent technologies are reshaping the ways in which governments connect with the public. Government new media are not merely tools for information dissemination, but also important arenas for observing government expression, public response, and the formation of interaction order in platform-based governance. Using 328544 original posts from 337 verified government Weibo accounts as the sample, this study applies NLP and machine learning methods to measure readability, emotional intensity, media richness, and agenda fluctuation, constructs residual performance indicators, and conducts analysis using a two-way fixed effects model for accounts and months. The results show that readability has a stable positive effect; media richness and agenda fluctuation exhibit contemporaneous or relatively weak positive effects; and emotional intensity lacks a stable direct promotional effect. Policy attention has an unstable direct effect but exerts a certain moderating effect, especially by altering the marginal effect of emotional expression. The study argues that the key to improving interaction on government Weibo lies in reducing the public's comprehension costs and optimizing modes of expression according to policy-attention contexts as well as regional and account-level differences.

Full Text

Government Expression and Public Interaction Mechanisms in Government New Media in the Era of Digital Intelligence

—An Analysis Based on Natural Language Processing and National Panel Data from Government Weibo

Abstract Digital-intelligence technologies are reshaping the ways in which government and the public are connected. Government new media are not merely tools for information dissemination, but also important arenas for observing governmental expression, public response, and the formation of interaction order in platform-based governance. This study takes as its sample 328,544 original posts from 337 verified government Weibo accounts. Using NLP and machine-learning methods, it measures readability, emotional intensity, media richness, and agenda fluctuation, constructs residual performance indicators, and conducts analysis with a two-way fixed-effects model for accounts and months. The results show that readability has a stable positive effect; media richness and agenda fluctuation exhibit contemporaneous or relatively weak positive effects; emotional intensity lacks a stable direct promotional effect; and the direct effect of policy attention is unstable, though it has a certain moderating effect, especially in altering the marginal role of emotional expression. The study argues that the key to improving interaction on government Weibo lies in reducing the public's cost of understanding, and in optimizing modes of expression according

to policy-attention contexts as well as regional and account-level differences.

[**Keywords**] government new media; interaction performance; digital-intelligence governance; natural language processing; policy attention

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I. Introduction

(1) Research Background

Since the 18th National Congress of the Communist Party of China, the Internet has become deeply embedded in national governance, public services, and social life, and the relationship between the government and the public has increasingly unfolded through digital platforms. General Secretary Xi Jinping has pointed out that “if we cannot pass the test of the Internet, we cannot pass the test of long-term governance,” and has required Party and government organs at all levels, as well as leading cadres, to learn to follow the mass line through the Internet and to regard the Internet as an important channel for understanding public opinion and carrying out their work. This means that cyberspace has not only changed the way government information is released, but has also changed how the public understands policies, expresses attitudes, and participates in public affairs. Therefore, research on government new media cannot stop at asking “what has been posted”; it must further ask how the government, through platform-based expression, establishes an interactive relationship with the public that is understandable, trustworthy, and responsive.

From the perspective of national governance practice, the Report to the 20th National Congress of the Communist Party of China proposed “strengthening the development of the all-media communication system and promoting the formation of a sound online ecology.” The General Office of the State Council, in the *Opinions on Promoting the Healthy and Orderly Development of Government New Media*, also pointed out that government new media are an important channel for the Party and the government to connect with, serve, and rally the masses in the era of the mobile Internet, and proposed building an “online government at the fingertips” that satisfies the people. This shows that the core task of government accounts is not merely to complete information transmission, but also to reduce the public’s cost of understanding, respond to social concerns, and, through sustained interaction, shape a relationship of trust between the government and the public.

Among various government new-media platforms, government Weibo is characterized by strong openness, rapid dissemination, observable interaction indicators, and relatively direct user feedback, making it an important window for observing the effects of government online communication. The public can express attitudes and willingness to participate in real time through likes, comments, and reposts. These interaction data are not only indicators of communication effects; they can also be understood as the public's allocation of attention, semantic comprehension, and relational response to government expression.

However, platform-based interaction does not automatically bring about effective communication. In practice, there are clear differences in the public responses generated by different government accounts and different forms of content expression. Some content, although important, may reduce willingness to read because its expression is obscure, its structure complex, and its jargon excessive; other content may be emotionally forceful, but may not necessarily be steadily converted into higher-quality participation. This indicates that the communication effects of government Weibo are influenced not only by factors such as follower size, posting frequency, and regional conditions, but are also closely related to the mode of expression in Weibo posts. Among these factors, readability concerns whether the public can smoothly decode government information; emotional intensity concerns the affective boundary of government expression; and media richness and issue fluctuations affect the allocation of public attention. These content

These features jointly constitute the interaction mechanism in platformized governance.

Existing studies have discussed at length the development of government new media, government information disclosure, and online public participation, but shortcomings remain. First, quantitative measurement of the content features of large-sample government-affairs Weibo posts is still relatively insufficient. Second, studies of interaction performance have paid more attention to variables such as follower counts, posting volume, and media formats, while devoting inadequate attention to other deeper textual features. Third, few studies identify the net effect of content expression on interaction performance after controlling for the basic influence of accounts and common monthly shocks.

Against this background, this paper examines government-affairs Weibo within the reconfiguration of government-public interaction in digital-intelligent governance, focusing on how features of content expression affect the allocation of public attention, the understanding of policy meaning, and interactive responses. The concern of this paper is not merely platform operation performance, but rather the relational mechanism through which digital platforms alter the connection between government expression and public response. To this end, this paper selects original-post data from 337 certified government-affairs accounts on Sina Weibo, constructs textual indicators using machine-learning methods, and further builds panel data to examine the conditional association between features of content expression and excess interaction performance.

(II) Research Significance

At the theoretical level, this paper helps advance research on government new media from evaluating communication effects to explaining the interaction mechanism between government and the public. Existing studies have mostly discussed the effects of government new media from the perspectives of platform development, government-affairs disclosure, service provision, and user participation. This paper shifts the research focus to the level of post expression, examining how readability, emotional intensity, media richness, and agenda fluctuation influence the public's understanding of, attention to, and response to government information, thereby providing empirical evidence for explaining the interaction order in digital-intelligent governance.

At the methodological level, this paper employs machine-learning text analysis and panel regression, offering a relatively systematic quantitative approach for research on government new media. By using natural-language-processing methods to extract content features such as readability, emotional intensity, media richness, and agenda fluctuation, and by constructing residual performance indicators on the basis of account-month panel data, the paper can more precisely identify the relationship between government-affairs expression and public interaction after controlling for baseline differences across accounts and common monthly shocks.

At the practical level, this paper can provide reference for the content governance of government-affairs Weibo. By testing the relationship between content features—such as readability, emotional intensity, media richness, and agenda fluctuation—and public interaction, this paper helps clarify how different modes of expression affect public attention, understanding, and response, and provides a basis for government-affairs accounts to optimize the boundaries of expression in policy interpretation, public reminders, livelihood services, and responses to emergencies.

II. Conceptual Definition and Literature Review

(I) Conceptual Definition

1. Government New Media Government new media refers to the digital communication carriers through which Party and government organs as well as public institutions use platforms such as Weibo, WeChat, short videos, and client applications to conduct information release, policy publicity, government services, public interaction, and responses to public opinion. Compared with traditional openness in government affairs, it places greater emphasis on platform-based communication, real-time feedback, and relational interaction. Studies on e-government abroad argue that government social media is used not only for information release, but is also related to transparency and accountability, public participation, and service provision (Tursunbayeva et al., 2017: 270–282). Domestic studies point out that government new media is embedded in the governmental organizational system, and that its operation is jointly

shaped by organizational mechanisms and platform logic (Sun Tao and Zhan Yucheng, 2025: 74-88). Other studies discuss the reconstruction of legitimacy and soft-governance mechanisms of government new media from the perspective of organizational fields (Zhu Jiangli and Tang Jie, 2024: 151-160).

2. Attention Allocation Theory Attention allocation theory focuses on how organizations and individuals selectively attend to issues under conditions of information overload and limited resources. Research on governmental attention allocation emphasizes that attention is a scarce resource in government decision-making and policy implementation, and can be examined at the policy, organizational, and individual levels (Sun Baiying and Zhou Baomin, 2022: 156-168). In the context of government new media, accounts need to allocate publishing resources among policy publicity, public services, risk reminders, and public-opinion responses; the public, in turn, will give priority to content that is easier to understand, more relevant, and better able to reduce the cost of information processing.

3. Symbolic Interaction Theory Symbolic interactionism emphasizes that social interaction is not a mechanical response to objective stimuli, but rather a process in which actors understand, interpret, and reproduce meanings around symbols. In government new media, text, images, videos, topic hashtags, account identities, and comment feedback all carry symbolic meaning. The public's likes, comments, and reposts of government-affairs content are not only feedback on the information itself, but also reinterpretations of the government image, policy meanings, and public relations. Wang Min's study of "Guangdong Release" distinguishes government WeChat interactions into forms such as dialogic, message-based, service-oriented, and ritualized interaction (Wang Min, 2017: 17-25). Research on government short videos also shows that the perspective of symbolic interaction helps explain the communication strategies of government-affairs content (Huang Lihua and Wang Xing, 2023: 38-40).

(II) Literature Review

With regard to the interactive performance of government new media, existing studies have mainly proceeded from organizational operation, resource conditions, and service

unfolds around capacity. Government new media undertake the functions of policy publicity, government services, and public-opinion response, while also being shaped by such logics as government regulation, news production, and public demand (Sun Tao and Zhan Yucheng, 2025: 74-88). The reconstruction of legitimacy and mechanisms of soft governance in the organizational field of government new media are also important entry points for understanding how accounts operate (Zhu Jiangli and Tang Jie, 2024: 151-160). Research on the administrative absorption of technology further suggests that interactive services on government-affairs Weibo need to establish an explanatory chain

between performance assessment and governance practice (Liu Jiang, 2024: 42–55). In terms of performance evaluation, the development of urban government-affairs Weibo is influenced by fiscal capacity, informatization, and educational level (Sun Zongfeng and Zheng Yueping, 2021: 77–89). Liu Wei measures the construction of a government-affairs Weibo performance index and its spatial differences (Liu Wei, 2023: 31–38). Studies of service-quality evaluation, meanwhile, construct evaluation indicators for government-affairs Weibo from the perspective of user behavior (Tan Min et al., 2024: 220–226). These studies provide organizational and resource-based perspectives, but there remains room to further examine how content expression affects interaction performance.

Research on attention allocation offers an important perspective for understanding content strategies on government-affairs Weibo. Content data from government websites can be used to observe the process from attention allocation to policy-level diffusion (Zhang Nan et al., 2023: 154–173). Studies of digital-village policy texts show that local governments differ in their allocation of attention and in the policy logics behind it (Li Yanling and Su Jian, 2024: 127–145). User-side research also suggests that the concentration of attention allocation affects information adoption among users of government open data (Zhao Xinyue et al., 2025: 45–56). The timeliness and richness of information affect public participation on social media (Li et al., 2022: 1–13). Li Qingzhen and Tang Tai, “based on data crawled with Python, used an LDA topic model and machine learning to identify hidden topics of user fatigue ...and obtained eight important topics that lead users to experience social-media fatigue,” ultimately summarizing the influencing factors of Weibo users’ fatigue as “media factors and individual factors” (Li Qingzhen and Tang Tai, 2022: 54). This provides a methodological reference for the present article’s use of web crawling, machine learning, and text mining to identify the issues and content features of government-affairs Weibo.

Studies related to symbolic interaction show that the effects of government communication depend not only on whether information is released, but also on how the public understands the symbols embedded in the content. Research on government-affairs WeChat emphasizes the specific types and feedback mechanisms in interactive communication (Wang Min, 2017: 17–25). Research on government-affairs short videos discusses their development strategies from the perspective of symbolic interaction theory (Huang Lihua and Wang Xing, 2023: 38–40). Studies of government anti-fraud short videos find that audiovisual symbols affect emotional arousal and value co-creation (Zhang Min and Zhang Ke, 2024: 127–140). Research on the entertainment-oriented treatment of public issues also shows that the way discourse is constructed on government-affairs Weibo affects public participation (Chen Xinyu, 2023: 5–9). After technology is embedded in governance, attention must still be paid to symbolic media, interactive fields, and the boundaries of publicness.

(Zhou Jinan and Su Houren, 2025: 46–55). Li Qingzhen and Yan Xuesen selected three native rural influencers on the Kuaishou platform, each with millions of

followers, as case samples. Using content analysis, they divided the cases into the start-up, growth, and maturity stages, incorporated an analytical framework of relational networks, trust building, and the construction of reciprocal norms, and tested the factors influencing communication effects through a fixed-effects model (Li Qingzhen and Yan Xuesen, 2026: 37). This provides a reference for the present study's integration of content analysis with quantitative testing.

Overall, existing research provides a threefold foundation for this study: research on government new media reveals the influence of organizational mechanisms and service capacity on communication performance; research on attention allocation demonstrates a dynamic relationship among issue configuration, information richness, and public attention; and research on symbolic interaction explains how textual, emotional, and multimedia symbols affect public understanding and participation. Nevertheless, existing studies still have shortcomings: large-sample comparative studies of government Weibo accounts nationwide remain limited; measurements of interaction performance rely heavily on raw numbers of likes, comments, and reposts, with relatively little effort to separate out account size, posting intensity, and common time shocks; and comprehensive tests of content variables such as readability, emotional intensity, media richness, and agenda fluctuations remain insufficient. Research on sentiment analysis of Chinese short texts provides a technical reference for sentiment identification in this study (Wu Xiaohua et al., 2019: 100-107). Research on digital government performance also suggests the need to control for performance gaps under regional and temporal conditions (Zhang Nan, Wang Yu, and Wei Ying, 2022: 57-65). On this basis, this study combines natural language processing, machine learning, and a two-way fixed-effects model to construct a residual performance indicator and examine the influence of content characteristics on the excess interaction performance of government Weibo accounts.

III. Theoretical Foundations and Research Hypotheses

(I) Theoretical Foundations

Drawing on attention-allocation theory and symbolic interaction theory, this paper understands the interaction performance of government Weibo as a relational outcome jointly formed by government expression and public response. Government Weibo is not traffic-oriented content in the general sense; rather, it is an interactive field in which government organizations, on digital platforms, use symbols such as text, images, videos, and topic hashtags to convey policy information, service information, and public attitudes to the public. Whether the public likes, comments on, or reposts such content depends not only on whether the information itself is important, but also on whether the public can quickly identify the value of the content under conditions of limited attention and develop an understanding of its policy implications, emotional tone, and action guidance.

Accordingly, this paper constructs an analytical framework of “content-

expression features—public attention and meaning interpretation—policy-attention context—excess interaction performance.” Readability mainly corresponds to the mechanism of cognitive cost: the clearer the text, the more easily the public can complete meaning decoding. Media richness mainly corresponds to the mechanism of symbolic visibility: images, videos, and topic hashtags can enhance the intuitiveness of information presentation. Agenda fluctuation mainly corresponds to the mechanism of attention allocation: moderate adjustment of topics helps respond to stage-specific public concerns. Emotional intensity corresponds to the emotional boundary of government symbols, and its effect is constrained by requirements of publicness, authority, and factuality. Policy attention is not merely an external policy variable, but rather the institutional context in which content expression takes effect; it may alter the public’s expectations regarding the accuracy, normativity, and executability of government information.

Thus, the empirical analysis in this paper does not simply compare the statistical significance of different content variables. Instead, after controlling for account fixed differences and common monthly shocks, it examines whether features of government expression remain systematically associated with the public’s excess interaction performance, and further investigates whether this association is influenced by the policy-attention context, account type, and regional environment.

(II) Research Hypotheses

Based on the theoretical framework above, this paper divides the content-expression features of government Weibo into four categories: readability, emotional intensity, media richness, and agenda fluctuation. Among them, readability corresponds to the cognitive cost of the public’s understanding of information; emotional intensity corresponds to the emotional boundary of government symbols; media richness corresponds to symbolic visibility in the platform information flow; and agenda fluctuation corresponds to the account’s allocation of attention to public issues. Policy attention, in turn, serves as an institutional-context variable that affects the relationship between content expression and public interaction.

1. Readability and the Interaction Performance of Government Weibo Government Weibo usually carries content such as policy explanations, public reminders, and service information. If the text is overly bureaucratic in style, the sentence structures are too long, or the focus is unclear, the public must incur higher comprehension costs, and their willingness to interact may also

may decline. Conversely, accessible, clear, and well-structured text can lower the threshold for comprehension, improve the public’s reading experience, and encourage feedback such as likes, comments, and reposts. Therefore, this paper proposes:

H1: The higher the readability of government-affairs Weibo texts, the higher their excess interaction performance.

2. Emotional Intensity and the Interaction Performance of Government-Affairs Weibo

Emotional expression is an important way for government new media to enhance affinity, but government communication also entails requirements of publicness, authority, and factuality. Excessively strong emotional expression may make content appear overly mobilizational or slogan-like, weakening the public's perception of the objectivity and credibility of the information. Especially in policy interpretation, law-enforcement notices, and responses to emergencies, the public needs clear facts, boundaries of responsibility, and guidance for action rather than mere emotional arousal. Therefore, this paper proposes:

H2: The effect of emotional intensity in government-affairs Weibo on excess interaction performance is context-dependent and does not exhibit a stable, direct positive influence.

3. Media Richness and the Interaction Performance of Government-Affairs Weibo

In the information-flow environment of the Weibo platform, multimedia forms such as images, videos, and topic tags can increase the visibility of content and also help the public understand information more intuitively. For content concerning policy processes, public safety, urban services, and the like, appropriate multimedia presentation can reduce comprehension difficulty and enhance communicative appeal. Therefore, this paper proposes:

H3: The higher the media richness of government-affairs Weibo, the higher its excess interaction performance.

4. Agenda Volatility and the Interaction Performance of Government-Affairs Weibo

If a government-affairs account publishes highly repetitive, single-topic agendas over a long period, it can easily cause audience attention fatigue; if it can adaptively adjust its agenda structure around changes in public affairs, it is more likely to respond to the public's stage-specific concerns and maintain the freshness and relevance of the account's content. Agenda volatility does not mean arbitrary shifts; rather, it reflects the account's dynamic allocation of priorities in public affairs. Therefore, this paper proposes:

H4: The higher the agenda volatility of a government-affairs Weibo account, the higher its excess interaction performance.

5. Policy Attention and the Interaction Performance of Government-Affairs Weibo

Policy attention reflects the institutional and agenda environment in which local government new-media communication is situated. When policy issues receive greater attention, the public's requirements for the accuracy, transparency, and implementability of information tend to be higher, and account communication is also more likely to be constrained by normative expectations. Therefore, policy attention may not directly bring about an improvement in interaction performance; instead, it may influence the effects of content strategies by changing the communication context. Therefore, this paper proposes:

H5: Policy attention has only a limited direct promotional effect on the excess interaction performance of government-affairs Weibo; its influence is manifested more primarily as a constraint imposed by the communication context.

6. The moderating role of policy attention

Policy attention may not only affect the performance of government-affairs Weibo, but also change the way content features operate. During periods of high policy attention, the public places greater emphasis on factual explanation, boundaries of responsibility, and guidance for action. Excessively strong emotional expression is more likely to be regarded as “emphasizing attitude while downplaying facts,” thereby weakening interaction effects. Accordingly, policy attention constitutes an important contextual condition under which content strategies exert their influence. Therefore, this paper proposes:

H6: Policy attention moderates the effect of content features on the excess interaction performance of government-affairs Weibo.

7. Heterogeneity in the effects of content strategies

The effects of content strategies in government-affairs Weibo are not completely consistent across all regions and all accounts. Different regions vary in their levels of economic development, digital infrastructure, public media literacy, and habits of exposure to government information; different types of accounts also assume different functions, and public expectations regarding their discursive styles change accordingly. Regions with relatively weak basic conditions may rely more on readability to lower the threshold for understanding, whereas regions with more fully developed media competition may place greater emphasis on visual presentation and professional expression. Accounts with specialized functions and comprehensive publishing accounts may also exhibit different mechanisms of content performance. Based on this, this paper proposes:

H7: The effect of content features of government-affairs Weibo on excess interaction performance exhibits heterogeneity across regions and account types.

Taken together, the above hypotheses correspond to an analytical framework of “content-expression features—public attention and meaning interpretation—

policy-attention context—excess interaction performance.” Next, in the research design section, this paper will explain how this theoretical framework is translated into variable measurement, model specification, and paths for empirical testing.

IV. Research Design

(I) Research Approach

Drawing on the theoretical framework developed above, this paper understands the interaction performance of government-affairs Weibo as a relational outcome between government expression and public response. In the context of digital-intelligent governance, government-affairs Weibo is not merely an information-release channel; rather, it is an interactive field in which government organizations convey policy information, service information, and public attitudes to the public through symbols such as text, images, videos, and topic hashtags. Whether the public likes, comments on, and reposts a post is influenced not only by external factors such as account size, regional conditions, and platform traffic, but also by the way the content is expressed.

Accordingly, the research design of this paper follows the analytical path of “content-expression features—public attention and meaning interpretation—excess interaction performance.” First, natural language processing and machine-learning methods are used to extract content features of government-affairs Weibo posts, including readability, emotional intensity, media richness, and agenda fluctuation. Second, a residual performance indicator is constructed to strip out the influence of accounts’ baseline popularity and routine publishing capacity on interaction data. Finally, based on account-month panel data, a two-way fixed-effects model is used to control for fixed differences across accounts and common monthly shocks, so as to test the relationship between content-expression features and excess interaction performance.

(II) Data Sources and Sample Construction

This study searched for the names of individual cities on Sina Weibo and selected a total of 337 verified government-affairs Weibo accounts with the largest numbers of followers before July 25, 2025. A web crawler was written in Python to collect, for each account, the most recent 1,000 original Weibo posts, including fields such as posting time, content, likes, comments, and reposts. In the end, 328,544 raw post records were obtained, with an average of approximately 975 posts per account. After data cleaning, this paper further aggregates the post data into panel data. Other macroeconomic data come from the *China City Statistical Yearbook* and local statistical yearbooks. Because some data are missing for certain prefecture-level cities, the sample size may vary to some extent.

(III) Variable Measurement

Following the theoretical framework, this paper divides the variables into four categories: dependent variables, core explanatory variables, moderating variables, and control variables. The dependent variable is the excess interaction performance of government-affairs Weibo, namely the residual performance obtained after controlling for an account's baseline interaction capacity and routine activity level. It is used to measure the public feedback an account receives in a specific month beyond its normal level. Compared with directly using the numbers of likes, comments, and reposts, residual performance can better strip out differences in accounts' follower size and long-term popularity, and is therefore more suitable for comparing interaction performance across different accounts and different periods.

The core explanatory variables include readability, emotional intensity, media richness, and agenda fluctuation. Readability ref

reflects the cognitive cost required for the public to understand government-affairs texts; emotional intensity reflects the affective coloration in government-affairs expression; media richness reflects the extent to which multimedia symbols such as images, videos, and topic tags are used; and agenda fluctuation reflects the extent to which an account adjusts its issue structure across different months. The moderating variable is policy attention, which is used to characterize the institutional and issue environment in which government-affairs new-media communication takes place. The control variables include relevant factors at the account, regional, and temporal levels, so as to reduce the influence of omitted variables on the estimation results.

1. Residual performance

On the basis of raw interaction volume, this paper further constructs the core dependent variable for the quantitative regression—residual performance. The core idea of this indicator is that the interaction level of government-affairs Weibo is, to a large extent, mechanically affected by posting intensity and audience base, such as the number of posts in the current month and follower size. At the same time, there may also be common shocks across accounts in the same month, leading to fluctuations in the interaction level of accounts in that month. To more accurately identify the net interaction performance brought about by content strategies, this paper first takes the natural logarithm of the total interaction volume, posting volume, and follower size in the current month, so as to compress extreme values and improve comparability.

Subsequently, this paper takes the total interaction volume in the current month as the dependent variable, regresses it on the logarithmic variables of posting volume and follower size in the current month, and absorbs month fixed effects to deduct common month-specific shocks across the whole platform. The regression residual is defined as Perf_excess_{it} , indicating the interaction performance of an account in a month that exceeds conventional expectations after controlling

for posting intensity, audience base, and common monthly shocks. The larger this value is, the more the public participation level in that month exceeds expectations; conversely, it indicates that interaction performance is lower than conventional expectations.

$$\begin{aligned}\ln y_{it} &= \alpha + \beta_1 \ln(\text{post}_{it}) + \beta_2 \ln(\text{fans}_{it}) + \tau_t + \varepsilon_{it} \\ \text{Perf_excess}_{it} &= \hat{\varepsilon}_{it}\end{aligned}\quad (1)$$

2. Media richness

Media richness is used to characterize the diversity of the forms in which information is presented on government-affairs Weibo. Through observation, four different media forms appear on Weibo: text, images, videos, and topic tags. This study defines media richness as the number of types of these four elements that appear, with values ranging from 1 to 4.

3. Agenda fluctuation

Agenda fluctuation is used to characterize the temporal issue stability and frequency of issue adjustment of government-affairs Weibo accounts, reflecting the way in which accounts allocate attention to public affairs in different months. Attention allocation theory emphasizes that the attention of government organizations is a scarce resource; constrained by information-processing capacity and organizational routines, organizations often need to select, rank, and continuously invest among a large number of issues. Attention allocation not only affects the scheduling of resources and the consistency of actions within the organization, but also affects the predictability of government behavior by the external public.

...and the formation of trust, thereby affecting interaction between the public and government-affairs Weibo accounts.

To quantify agenda change under large-sample conditions, this paper first uses machine-learning techniques to automatically induce topics, and then aggregates the topic distribution by month. Government-affairs Weibo texts are characterized by being “short, rich in synonymous expressions, and containing many template words.” If word-frequency methods such as keywords or TF-IDF are used, content that differs in wording but concerns the same issue can easily be misclassified into different topics, or the results may be disturbed by high-frequency general words. To obtain a more stable division of issues and support the subsequent measurement of monthly agenda volatility, this paper uses a vector model to semantically represent the texts.

Compared with word vectors or character vectors, sentence vectors are more suitable for the scenario of this paper. On the one hand, the same issue in short government-affairs Weibo texts is often expressed in different wording; word and character vectors usually require further complex aggregation before they can represent the semantics of an entire sentence, and the results are easily affected by high-frequency general words and word-segmentation errors. On

the other hand, character- and word-level vectors are more oriented toward local semantics, making it difficult to stably capture the overall meaning of an entire Weibo post at the issue level, such as policy publicity, public-convenience services, and emergency management.

Therefore, this study uses the Chinese pretrained sentence-vector model BAAI/bge-base-zh-v1.5 to encode each Weibo text as a semantic vector, so that texts with similar semantics are closer to one another in vector space, thereby providing a semantic basis for subsequent topic clustering (Xiao et al., 2023: 1-9). To enhance the stability of similarity calculation, the vectors are normalized when generated.

Because semantic vectors have relatively high dimensionality, direct clustering not only entails high computational cost, but may also reduce clustering quality due to the curse of dimensionality. For this reason, this paper first uses principal component analysis to perform preliminary dimensionality reduction on the semantic vectors, preserving the main informational structure; it then uses a nonlinear dimensionality-reduction method (UMAP) to further project the semantic structure into a lower-dimensional space, so as to better preserve local neighborhood relationships. In the reduced-dimensional space, this paper uses the K-Means clustering algorithm to divide the texts into several semantic topic categories.

Regarding the selection of the number of topics K , in order to minimize subjective error as much as possible, this study uses the silhouette coefficient to measure within-cluster compactness and between-cluster separation, and thereby determines the number of topics.

Plot title: Plot of the silhouette coefficient as the number of topics changes

Vertical axis: Silhouette coefficient

Horizontal axis: Number of topics K

Annotation: Highest value: $K = 40$, 0.394

Figure 1 Plot of the silhouette coefficient as the number of topics changes

Table 1 Keywords and Topics

No.	Topic keywords	Topic name
0	deepseek; hundred million yuan; Belt and Road; artificial intelligence; iphone; “Hundreds-Thousands-Tens of Thousands Project” ; Canton Fair; high-quality development; large model; robot	Technological innovation and high-quality development
1	microphone; repost and save; doctor’ s reminder; <i>Life Times</i> ; expert reminder; doctor’ s introduction; life circle; experts say; vitamin; dog days	Health popularization and rumor debunking in daily life
2	traffic-police reminder; jointly creating civilized transportation; traffic-police notice; Road Traffic Safety Law of the People’ s Republic of China; points/permission; fine; safe Spring Festival travel with traffic police; summer campaign; safe escort	Traffic-safety rectification and traffic-police legal education
3	Online Chinese Festivals; Spring Festival; Dragon Boat Festival; March Third; New Year flavor; dna; Lantern Festival; Our Festival; “Sisi Ruyi Chinese New Year” ; village evening gala	Urban culture-and-tourism activities and lively everyday life

No.	Topic keywords	Topic name
4	millimeters; temperature; gusts; highest temperature; expected; lowest temperature; weather expected in the coming days; No. typhoon; cloudy; southerly wind	Weather forecasts and natural-disaster warnings
35	“Winter Tours in Yunnan Are Best in Baoshan” ; <i>Chang’ an’ s Lychees</i> ; this season; craving; Great Heat; delicacies; come and try; steaming above and boiling below; Summer Solstice; Deyang	Food and tourism
36	the meeting emphasized; expand; deputy secretary of the municipal Party committee; the Two Upholds; the Two Establishes; member of the municipal Party committee standing committee; he emphasized; resolutely achieve; the meeting pointed out; meeting	Party-building study and meeting records
37	Nezha; labubu; <i>Ne Zha: The Demon Child Makes Waves in the Sea</i> ; Youth Chapter; starring; <i>The Legend of Zang Hai</i> ; IP; “Jiangxi Shines” ; Children’ s Day	Integrated-media programs and entertainment hotspots

No.	Topic keywords	Topic name
38	hpv; wash hands frequently; as of; death; prevent importation from outside; villages; avoid gatherings; fatigue; wear masks; do not spread rumors; prevent resurgence internally	Public health and infectious-disease prevention-and-control advisories
39	Jiangsu Super League; vs; program; congratulations; Jiangxi Super League; call; Village Super League; Yancheng; kilometers; sports	Local competitions and public fitness

As shown in Figure 1, the silhouette coefficient reaches its maximum value of 0.394 when $K = 40$. Therefore, this study ultimately selects the number of topics as 40.

As shown in Table 1, this study excerpts the clustering keyword results for 10 of the 40 topics. It can be seen that the keywords are relatively focused, the topics have a certain degree of differentiation, and the topic-classification effect is acceptable.

Based on these classification results, this study compares the proportion of each topic for each account in each month with that in the previous month, uses the total variation distance (TV) to compare the distributional differences between two adjacent months, and finally obtains a result between 0 and 1.

$$Vol_tv_{it} = \frac{1}{2} \sum_{k=1}^K |p_{itk} - p_{i,t-1,k}| \quad (2)$$

where p denotes the proportion, i denotes the account, t denotes the month, and k denotes the topic type. When the result is 0, it indicates that the topics in the current month are exactly the same as those in the previous month; 1 indicates that the topics in the current month are completely different from those in the previous month.

4. Policy Attention

Policy attention is used to characterize the intensity of policy supply in the local institutional environment related to government new media and digital governance. Drawing on the research method of Zhang Nan et al., this paper uses “government affairs Weibo,” “government affairs new media,” and “digital government” as keywords in PKU Law to collect a total of 3,754 local policy documents related to government new media construction and digital governance (Zhang Nan, Wang Yu, Wei Ying, 2022: 57–65). To transform policy texts into quantitative indicators usable for panel regression, this paper further matches the policy documents by region and time.

First, based on information such as the policy-making agency and issuing agency, the region to which each policy belongs is identified, and provincial names are standardized to form regional keys that can be matched with the locations of the sample accounts; the small number of policy records that cannot be automatically matched are listed separately and manually checked and completed. Second, this paper standardizes policy time to the monthly level. When the implementation time can be obtained, the implementation month is used first; if the implementation month is missing, the promulgation month is used as a substitute, thereby determining a unique month of occurrence for each policy.

Considering that the influence of policy documents on government new media work is usually not fully manifested in the same month, but is gradually implemented over a subsequent period through deployment, training, assessment, and resource allocation, this paper constructs a rolling policy-supply indicator: for each month, the number of new policies in that month and in the preceding three months is accumulated, and the logarithm is then taken as the policy-attention indicator. This indicator reflects the sustained pressure and cumulative intensity of local digital-governance policy supply, avoiding the random fluctuations that would result from using only the number of newly added policies in the current month.

5. Emotional Intensity

Emotional intensity is used to measure the degree of emotionalization in government-affairs Weibo texts at the level of expression—that is, whether the text exhibits salient emotional cues and features of affective mobilization. Considering that government-affairs Weibo texts are short, diverse in form of expression, and frequently involve synonym substitution, this paper adopts a supervised-learning-based emotion classification method to conduct six-class emotion recognition on Weibo posts, and on this basis constructs a continuous indicator of emotional intensity.

Because this paper mainly studies original Weibo posts, while other Weibo emotion datasets contain a large number of comment-type Weibo texts and have overly coarse categories, this study decided to use the data provided in the “SMP2020 Weibo Emotion Classification Technical Evaluation” for training. This

dataset classifies each Weibo post into one of six categories: “angry, neutral, happy, sad, surprise, and fear.”

Drawing on the method used by Wu Xiaohua and colleagues, this study selects the model parameters with the best validation-set Macro-F1 across multiple rounds of iteration through a training-set/validation-set split. It adopts a deep-learning architecture that combines character-level representation with sequence modeling, while also using character-level TF-IDF+SVM as a baseline model for comparison, so as to ensure that the classification results have an interpretable performance basis (Wu Xiaohua, Chen Li, Wei Tiantian et al., 2019: 100-107). After model training is completed, this paper performs inference on the full set of government-affairs Weibo data, obtains the predicted probability distribution for each Weibo post across the six emotion categories, outputs the predicted emotion category and the probability values for each category, and maps them onto the range of 0-100 to facilitate regression analysis.

Table 2 Validation-set results of the SVM baseline model

	Precision	Recall	F1 score	Sample size
angry	0.7679	0.7734	0.7706	834
neutral	0.7899	0.8174	0.8034	575
happy	0.7132	0.6747	0.6934	538
sad	0.5659	0.5852	0.5754	499
surprise	0.6129	0.5455	0.5772	209
fear	0.6107	0.6557	0.6324	122
accuracy			0.7072	2777
macro avg	0.6767	0.6753	0.6754	2777
weighted avg	0.707	0.7072	0.7067	2777

Table 3. Test-Set Results of the SVM Baseline Model

	Precision	Recall	F1 score	Sample size
angry	0.7773	0.7706	0.7739	1508
neutral	0.7692	0.801	0.7848	990
happy	0.6958	0.6965	0.6961	1018
sad	0.5911	0.5733	0.5821	900
surprise	0.5669	0.5214	0.5432	374
fear	0.5966	0.6762	0.6339	210
accuracy			0.7034	5000
macro avg	0.6661	0.6732	0.669	5000
weighted avg	0.7022	0.7034	0.7025	5000

Table 4. Main Model Results

	Precision	Recall	F1 score	Sample size
angry	0.7495	0.7977	0.7729	1508
neutral	0.8218	0.8061	0.8139	990
happy	0.6934	0.7308	0.7116	1018
sad	0.6444	0.5356	0.585	900
surprise	0.5864	0.508	0.5444	374
fear	0.5663	0.7524	0.6462	210
accuracy			0.715	5000
macro avg	0.677	0.6884	0.679	5000
weighted avg	0.7136	0.715	0.7123	5000

Table 5. Iterative Performance of the Main Model

	Loss	Validation Acc	Validation Macro-F1	Test Acc	Test Macro-F1
Epoch 1	1.0792	0.7008	0.6544		
Epoch 2	0.7977	0.7101	0.6638		
Epoch 3	0.6695	0.7159	0.6716		
Epoch 4	0.5508	0.7227	0.6832		
Main				0.715	0.679

The results show that the baseline model achieves an accuracy of 0.7072 and a macro-average F1 of 0.6754 on the validation set; on the test set, its accuracy is 0.7034 and its macro-average F1 is 0.6690. By comparison, the main model adopted in this paper achieves an accuracy of 0.7150 and a macro-average F1 of 0.6790 on the test set, outperforming the baseline model overall. This indicates that the model can attain relatively stable discriminative capability in the six-class emotion recognition task.

6. Readability Index

The readability index is used to characterize the difficulty of understanding government-affairs Weibo texts and the clarity with which information is presented, thereby measuring the level of comprehensibility of government-affairs information provision. Considering that government-affairs Weibo texts are short, contain many synonymous expressions, and

There are many formulaic phrases and template-based expressions. To achieve automated measurement of the full dataset while maintaining interpretability, this paper constructs a readability indicator using a supervised-learning modeling approach based on manual annotation.

First, this study uses manual annotation to define three levels of readability and converts them into trainable supervised labels. The model is then trained

with these labels as the target variable, and finally the model output is made continuous to form a 0–100 readability index that can be directly incorporated into regression analysis.

Specifically, this paper first constructs a three-level readability evaluation guideline based on manually annotated samples to ensure consistency in judgment criteria. It then extracts 2,000 items from the full set of blog posts to build the training set, with four annotators (A, B, C, and D) sharing the annotation work equally. To control for subjective bias and test annotation consistency, this paper conducts a spot-check review: 25% of each annotator's samples (125 items each) are independently reviewed by an inspector, forming a total of 500 comparison samples. The spot-check results show that the overall exact agreement rate between annotation and review is 91.4% (457/500); the exact agreement rates between each annotator and the inspector are: A 91.2% (114/125), B 88.8% (111/125), C 93.6% (117/125), and D 92% (115/125). Considering that the three-level labels have an ordinal relationship, this paper further uses consistency coefficients for quality evaluation: the Cohen's Kappa for the sampled cases is 0.856, the linearly weighted Kappa is 0.865, and the quadratically weighted Kappa is 0.875, indicating that the annotation criteria are highly stable and can serve as a reliable basis for supervised-learning training.

Subsequently, this paper uses the Chinese HIT RoBERTa pretrained model `hfl/chinese-roberta-wwm-ext` to encode the cleaned text and extract semantic representations, so as to capture semantic consistency in short texts where expressions differ but meanings are similar, and to reduce the interference of synonym substitution and colloquial expression with readability measurement (Cui et al., 2021: 3504–3514). Because the three readability levels are naturally ordered, this paper trains the model using an ordinal classification framework, converting the three-level labels into a task of discriminating adjacent thresholds. This better fits the textual characteristics of continuously varying comprehension difficulty and fuzzy boundaries, and reduces the bias introduced by treating the three levels as unordered categories.

Specifically, this study stratifies the 2,000 annotated samples by category into a training set of 1,500 items and a validation set of 500 items. During training, validation-set performance is continuously monitored, with macro-average F1 used as the early-stopping criterion. When the model no longer improves on the validation set, training is stopped and the best version is retained. The training-set data serve as the target variable for model training; during training, after each prediction, the model compares the prediction with the corresponding label, calculates the loss, and updates the parameters accordingly.

Finally, the model outputs predicted results for the three readability levels and further generates a continuous index that can be used for quantitative analysis. To make the regression interpretation more intuitive, this paper maps the model output onto a 0–100 readability index: higher values indicate greater readability, while lower values indicate greater obscurity.

(IV) Model Specification To test the relationship between content-expression features and the excess interaction performance of government-affairs Weibo accounts, this paper constructs an account-month panel model and estimates it using a two-way fixed-effects model with account fixed effects and month fixed effects. The benchmark model is specified as follows:

$$Perf_excess_{it} = \alpha + \beta_1 Read_{it} + \beta_2 Emo_{it} + \beta_3 Media_{it} + \beta_4 Vol_{it} + \beta_5 Policy_{it} + \mu_i + \tau_t + \varepsilon_{it} \quad (3)$$

where $Perf_excess_{it}$ denotes the residual performance of account i in month t ; $Read_{it}$, Emo_{it} , $Media_{it}$, and Vol_{it} denote readability, emotional intensity, media richness, and agenda volatility, respectively; $Policy_{it}$ denotes policy attention; μ_i is the account fixed effect, used to control for time-invariant baseline differences at the account level; τ_t is the month fixed effect, used to control for the platform environment, major public events, and seasonal public-opinion fluctuations faced jointly by all accounts; and ε_{it} is the random disturbance term.

To examine the temporal persistence of the effects of content-expression features, this paper further estimates a one-period lag model:

$$Perf_excess_{it} = \alpha + \beta_1 Read_{i,t-1} + \beta_2 Emo_{i,t-1} + \beta_3 Media_{i,t-1} + \beta_4 Vol_{i,t-1} + \beta_5 Policy_{i,t-1} + \mu_i + \tau_t + \varepsilon_{it} \quad (4)$$

To test whether policy attention changes the marginal effects of content-expression features, this paper constructs a moderation-effect model:

$$Perf_excess_{it} = \alpha + \sum_k \beta_k Z_{kit} + \theta Policy_{it} + \sum_k \delta_k (Z_{kit} \times Policy_{it}) + \mu_i + \tau_t + \varepsilon_{it} \quad (5)$$

where Z_{kit} denotes the k -th category of content-expression features, including readability, emotional intensity, media richness, and agenda volatility; δ_k is the moderation-effect coefficient. If δ_k is significant, it indicates that policy attention changes the relationship between the corresponding content feature and excess interaction performance.

V. Empirical Analysis

According to the theoretical framework set out above, the empirical analysis proceeds at three levels. First, it examines whether expressive features of the content—such as readability, emotional intensity, media richness, and agenda volatility—are systematically associated with residual performance. Second, it tests whether such associations conform to the theoretical expectations of attention allocation and symbolic interaction mechanisms. Third, it investigates

whether policy attention, account type, and regional context alter the way content strategies operate. Therefore, the empirical analysis below focuses not only on whether the variables are significant, but also on the theoretical implications of different results.

(I) Descriptive Statistics

To present intuitively the overall distributional characteristics of the variables in the sample, this paper first conducts descriptive statistics for the account-month panel sample used in the regression analysis. The results are shown in the table. The dependent variable is residual performance, whose mean is close to 0, consistent with the construction logic of the residual variable. At the same time, its range is relatively wide, indicating that, after controlling for structural factors such as account size and activity level, different accounts still exhibit a relatively pronounced space of interaction fluctuation beyond routine expectations at different points in time.

Table 6 Descriptive Statistics

Variable	Sample Size	Mean	Standard Deviation	Minimum	Maximum
Residual performance	3617	.0214943	1.607276	-4.628796	9.482068
Readability index	3617	50.58369	12.07603	6.475317	92.05639
Emotional intensity	3617	82.8792	8.791313	37.72137	99.94279
Media richness	3617	1.790831	.5585817	1	3.010989
Agenda volatility	2599	.3746631	.1774414	0	1
Policy attention (log)	3617	.8377254	.8051048	0	3.258097
Total monthly interactions	3617	984.4139	21317.31	0	1234713
Monthly number of posts	3617	63.89909	70.92695	1	485

Core-variable correlation heatmap

Figure 1: Core-variable correlation heatmap

Variable	Sample Size	Mean	Standard Deviation	Minimum	Maximum
Number of followers of the account in that month	3617	368650	566331.3	2177	4307326
Total sample size	3617				

Note: Agenda volatility is calculated from the difference in topic distributions between two adjacent months. For the first month and for accounts or months lacking data from the preceding month, it cannot be calculated; hence the sample size is smaller.

Before conducting the regression, this paper also reports the results of tests for correlations among variables and multicollinearity. The correlation matrix is used to provide a preliminary observation of the linear associations among variables. Furthermore, in the context of fixed effects, this paper calculates VIF after transforming the explanatory variables by removing individual fixed effects. The results show that, overall, the largest correlation coefficient among the variables is 0.52, and all are below 0.6, indicating that correlations are generally not high and will basically not cause substantive damage to the coefficient estimates of the regression model.

Among them, residual performance is fairly clearly positively correlated with readability, and is also positively correlated with media richness, while it is negatively correlated with emotional intensity. There is a certain degree of correlation among the core explanatory variables: in particular, readability and media richness show a moderate positive correlation, and emotional intensity and media richness show a moderate negative correlation, but overall no abnormally high correlations appear. Furthermore, the VIF values calculated after the within transformation to remove fixed effects are all relatively low, indicating that the model does not face a serious risk of multicollinearity and can proceed to the subsequent benchmark regressions and robustness tests.

Figure 2 Core-Variable Correlation Heatmap**Table 7 Multicollinearity Test**

Variable	VIF	1/VIF
Media richness	1.42	0.705665
Readability index	1.38	0.724399
Emotional intensity	1.05	0.955047
Agenda volatility	1.01	0.993018
Policy attention (log)	1.00	0.995954
Mean VIF	1.17	

(II) Classification and Analysis of Government-Affairs Weibo Based on the K-Means Algorithm

To characterize the systematic differences among government-affairs Weibo accounts in terms of content expression and operational style, this paper, based on account

Semantic representations are constructed from historical post texts, and unsupervised clustering is then performed on this basis to form a typology of accounts. The specific procedure is as follows: for each account, a certain number of representative Weibo texts are extracted, cleaned, and de-templated; the Chinese sentence-vector model BAAI/bge-base-zh-v1.5 is then used to map the texts into semantic vectors; and multiple Weibo vectors are aggregated at the account level—using the mean representation followed by normalization—to obtain account-level semantic feature vectors (Xiao et al., 2023: 1-9).

In implementing the clustering, this paper first uses PCA to reduce the dimensionality of the high-dimensional semantic vectors, and then uses UMAP to construct a neighborhood structure based on cosine distance, so as to preserve local similarities among accounts. Finally, K-Means is applied in this low-dimensional space to complete the clustering. To be as objective as possible, this study evaluates the quality of partitions under different values of K using the silhouette coefficient, while also imposing constraints on the minimum cluster size and the maximum cluster share, in order to avoid situations in which an overly large or overly small class leads to inflated evaluation indicators.

As can be seen from the figure below, the silhouette coefficient gradually declines after $K = 2$, rises slightly at $K = 8$, and then remains basically stable. Therefore, taking into account both clustering quality and interpretability, this paper ultimately selects the partitioning scheme with $K = 8$. The interpretation of the specific clusters and the corresponding accounts is shown in the following table.

Figure: Line chart titled “Variation in the Silhouette Coefficient for Account Clustering.” The vertical axis is “Silhouette coefficient,” and the horizontal axis is “Number of clusters K .” An annotation marks “Selected: $K = 8$.”

Figure 3. Variation in the Silhouette Coefficient for Account Clustering

Table 8 Account Clustering

Cluster	Cluster name	Number of accounts	Representative accounts
C0	Provincial-capital and leading comprehensive release accounts	83	Shanghai Release, Beijing Release, Nanjing Release
C1	Fire-and-rescue accounts	16	Zhongwei Firefighting, Yunfu Firefighting, Nanping Firefighting
C2	Public security, judicial, and traffic-law-enforcement accounts	51	Sanming Police, Nanchong Public Security, Shangluo Traffic Police
C3	Northern and borderland comprehensive release accounts	31	Urumqi Release, Kashgar Release, Shigatse Release
C4	Government portals and other mixed government-department accounts	45	China Yiyang Portal, Guang'an Municipal Committee of the Communist Youth League, Liupanshui Government Affairs Weibo
C5	Cultural-tourism and brand-promotion release accounts	29	Lijiang Release, Dali Release, Xishuangbanna Release

Cluster	Cluster name	Number of accounts	Representative accounts
C6	General prefecture-level city comprehensive release and government-service accounts	48	Dongying Release, Dezhou Release, Datong 12345 Hotline
C7	Coastal developed-city release accounts	34	China Guangzhou Release, Shenzhen Weibo Release Office, Foshan Release

Among them, “fire-and-rescue accounts” and “public security, judicial, and traffic-law-enforcement accounts” are highly concentrated in terms of account names and departmental attributes, with clear type boundaries, indirectly indicating that the classification performs well. The remaining types are mainly composed of comprehensive government-affairs accounts such as release accounts, government-network accounts, portal-network accounts, and integrated-media accounts, but they show certain differences in operational positioning and city level.

Figures 4 and 5 show the distribution of cluster sizes under different K : when K is relatively small, accounts are mainly coarsely

roughly divided into combinations of large and small clusters, making them difficult to use for fine-grained type comparison. When K increases to 8, the sizes of the clusters become more balanced, and interpretable type differences can be formed in terms of organizational attributes and functional positioning. Furthermore, Figure 5 presents the splitting relationships of the cluster structure through hierarchical visualization, indicating that as K increases, the interior of the originally comprehensive publishing category is gradually subdivided, while account types with clear departmental attributes maintain relatively stable independence.

Figure 4. Cluster-size distribution of clusters

Figure 5. Sunburst chart of account clustering

From the clustering results, accounts in the fire-and-rescue category and those in the public security, judicial, and traffic law-enforcement category have relatively clear functional boundaries. By contrast, accounts in the provincial-capital and leading comprehensive information-release category, the coastal developed-city

information-release category, and the cultural-tourism brand-promotion category reflect different content positioning and audience expectations. These differences in functional positioning and expressive style provide a classification basis for the subsequent examination of heterogeneity across account types. Based on the semantic clustering results, this paper uses account type as the grouping dimension in the subsequent heterogeneity analysis and strategic recommendations, examining whether the relationship between content-expression characteristics and residual performance differs under different functional positioning and content styles.

(V) Benchmark Regression

Table 9 Benchmark Regression of Residual Performance

Variable	(1) Account fixed effects onlyCurrent- period model	(2) Account fixed effects onlyLagged model	(3) Two-way fixed effectsCurrent- period model	(4) Two-way fixed effectsLagged model
Readability	0.371***		0.368***	
Readability	(0.054)		(0.084)	
Emotional	-0.047		-0.052	
intensity				
Emotional	(0.043)		(0.057)	
intensity				
Media	0.201***		0.208***	
richness				
Media	(0.059)		(0.059)	
richness				
Agenda	0.074***		0.071**	
fluctua- tion				
Agenda	(0.026)		(0.031)	
fluctua- tion				
Policy	0.070*		0.036	
atten- tion(three months)				
Policy	(0.042)		(0.063)	
atten- tion(three months)				
Readability($t-1$)		0.242***		0.225***

Variable	(1) Account fixed effects onlyCurrent- period model	(2) Account fixed effects onlyLagged model	(3) Two-way fixed effectsCurrent- period model	(4) Two-way fixed effectsLagged model
Readability($t-1$)		(0.058)		(0.058)
Emotional intensity($t-1$)		-0.006		-0.002
Emotional intensity($t-1$)		(0.046)		(0.047)
Media richness($t-1$)		0.036		0.050
Media richness($t-1$)		(0.065)		(0.109)
Agenda fluctuation($t-1$)		0.073***		0.079*
Agenda fluctuation($t-1$)		(0.028)		(0.040)
Policy atten- tion(three months, $t-1$)		0.055		0.015
Policy atten- tion(three months, $t-1$)		(0.046)		(0.071)
Observations	2599	2343	2599	2343
R ²	0.718	0.699	0.724	0.704
Account fixed effects	Controlled	Controlled	Controlled	Controlled
Month fixed effects	Not controlled	Not controlled	Controlled	Controlled

Note: The dependent variable is residual performance. Residual performance

has already netted out posting volume, follower size, and common monthly shocks at the construction stage; “month fixed effects” in the table indicates whether month fixed effects are further absorbed in the second-stage regression. Robust standard errors clustered by account and province are reported in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 9 reports the baseline regression results for residual performance. It should be noted that the dependent variable in this paper is residual performance; during its construction, the influence of common shocks in some months has already been removed. Therefore, it is not the original scale of interaction. Based on this dependent variable, columns (1) and (2) first control only for account fixed effects in the second-stage regression, in order to observe the basic association between content-expression characteristics and excess interaction performance. Columns (3) and (4) further add month fixed effects in the second stage, forming a stricter two-way fixed-effects specification to control for possible common monthly changes in the content characteristics themselves. By comparing the two groups of models, we can assess whether the main conclusions depend on the common public-opinion environment of particular months, changes in platform traffic, or the rhythm of content publication.

The results show that readability is significantly positive in all four models, making it the most stable explanatory variable. In the models that control only for account fixed effects, the contemporaneous coefficient of readability is 0.371, and the one-period lag coefficient is 0.242; both are significant at the 1% level. After month fixed effects are added, the contemporaneous coefficient of readability is 0.368, and the one-period lag coefficient is 0.225; both are likewise significant at the 1% level. This indicates that the positive relationship between readability and residual performance does not depend on the common public-opinion environment of specific months, but remains valid after controlling for account-level fixed differences and further controlling for common monthly variation. This result supports the cognitive-cost mechanism in the theory of attention allocation: the more accessible the text and the clearer its structure, the easier it is for the public to understand it and generate interactive feedback.

Media richness mainly exhibits a positive contemporaneous effect. In the model that controls only for account fixed effects, the contemporaneous coefficient of media richness is 0.201 and is significant at the 1% level; after month fixed effects are added, its contemporaneous coefficient is 0.208 and remains significant at the 1% level. However, the one-period lag coefficient of media richness is not significant in either type of model, indicating that multimedia elements such as images, videos, and topic tags are more likely to operate by enhancing immediate visibility, and that their influence is strongly short-term. Agenda fluctuation also shows a relatively stable positive relationship: in the contemporaneous models, the coefficients are 0.074 and 0.071, respectively, both reaching significance; in the one-period lag models, the coefficients are 0.073 and 0.079, respectively, and also remain positively significant or weakly significant. This

suggests that moderate adjustment of the issue structure helps sustain public attention.

By contrast, emotional intensity does not show a significant effect in any of the four models, indicating that interaction with government-affairs Weibo accounts does not simply increase as emotional expression strengthens. The results for policy attention are more context-dependent: in the contemporaneous model that controls only for account fixed effects, the coefficient of policy attention is 0.070 and is weakly significant at the 10% level; however, after month fixed effects are added, its coefficient falls to 0.036 and is no longer significant, and the one-period lag results are also insignificant. This indicates that the direct promotional effect of policy attention is not robust and may be partly affected by common time variation or the rhythm of content publication. Therefore, in the following text, it is more appropriate to understand policy attention as

as the institutional context that conditions the role of content strategies, rather than as a stable factor that directly increases excess interaction performance.

Overall, the baseline regressions support the core judgment of this paper. Readability is the most stable content mechanism. Media richness and agenda volatility mainly exhibit positive effects; among them, media richness is more inclined toward an immediate effect, while agenda volatility has a certain degree of persistence. Emotional intensity lacks a stable direct effect, and the direct effect of policy attention weakens under the stricter two-way fixed-effects specification. Therefore, in the following sections, this paper will further examine, through robustness tests, moderation effects, and heterogeneity analysis, whether the above relationships remain consistent under different model specifications and in different contexts.

(VI) Robustness Tests

Table 10 Robustness tests: Two-way fixed-effects models for residual performance

Variable	(1)Add controls	(2)Account trend	(3)Province × month	(4)Policy six months	(5)Policy decay
Readability	0.371***	0.376***	0.346***	0.370***	0.366***
Readability	(0.083)	(0.069)	(0.090)	(0.084)	(0.084)
Emotional	-0.051	-0.073	-0.085	-0.052	-0.050
inten-					
sity					
Emotional	(0.054)	(0.048)	(0.050)	(0.057)	(0.057)
inten-					
sity					
Media	0.206**	0.248**	0.197**	0.208**	0.208**
richness					

Variable	(1)Add controls	(2)Account trend	(3)Province × month	(4)Policy six months	(5)Policy decay
Media richness	(0.089)	(0.092)	(0.093)	(0.088)	(0.088)
Agenda volatil- ity	0.073*	0.050	0.047	0.072**	0.070**
Agenda volatil- ity	(0.039)	(0.039)	(0.036)	(0.030)	(0.030)
Policy atten- tion (three months)	0.036	-0.001			
Policy atten- tion (three months)	(0.063)	(0.080)			
Number of posts (log)	0.016				
Number of posts (log)	(0.088)				
Policy atten- tion (six months)				0.034	
Policy atten- tion (six months)				(0.060)	
Policy atten- tion (decay)					-0.043
Policy atten- tion (decay)					(0.097)
Observations	2599	2599	2436	2599	2599
R ²	0.724	0.776	0.808	0.723	0.723

Variable	(1)Add controls	(2)Account trend	(3)Province $\times$ month	(4)Policy six months	(5)Policy decay
Account fixed effects	Controlled	Controlled	Controlled	Controlled	Controlled
Month fixed effects	Controlled	Controlled	Controlled	Controlled	Controlled
Province $\times$ month fixed effects	Not controlled	Not controlled	Controlled	Not controlled	Not controlled

Note: Column (1) adds a control for the number of posts; column (2) controls for account-specific linear trends; column (3) absorbs province $\times$ month shocks; columns (4) to (5) replace the measurement of policy attention.

Table 10 further tests the sensitivity of the baseline conclusions to model specification and the construction of the policy variable. The results show that readability remains significantly positive after adding other control variables, controlling for account-specific linear trends, absorbing province $\times$ month fixed effects, and replacing the policy measure; it is the most robust content feature. Media richness

also remains positive and significant under the main specification. By contrast, the significance of agenda volatility declines under some stricter specifications, indicating that its explanatory power is more sensitive to controls for common shocks. Policy attention does not exhibit stable significance under alternative measures; therefore, this paper no longer interprets it as a factor that directly improves residual performance. Overall, the robustness tests support the core judgment that “readability is the most stable, media richness is contemporaneously effective, and agenda volatility is weakly robust.”

(VII) Further Analysis: Moderating Effects and Heterogeneity Discussion

In this section, the study further examines the moderating effects of policy attention under different content characteristics, and explores the heterogeneous effects of different types of content on excess interaction performance. Specifically, this paper first introduces policy attention and its interaction terms with content characteristics to test whether the marginal effects of different content strategies change under policy-advancement contexts; subsequently, it examines the moderating roles of macroeconomic and digital-infrastructure variables, and discusses heterogeneity by account type, economic region, and ethnic-minority areas.

1. The Moderating Role of Policy Attention

Table 11 Moderating Effects of Policy Attention

Variable	(1) Three-Month Policy	(2) Six-Month Policy	(3) Tapering Policy
Readability	0.365***	0.368***	0.362***
Readability	(0.084)	(0.087)	(0.087)
Emotional intensity	-0.053	-0.046	-0.046
Emotional intensity	(0.057)	(0.053)	(0.053)
Media richness	0.209**	0.209**	0.209**
Media richness	(0.089)	(0.089)	(0.090)
Agenda volatility	0.068**	0.069**	0.068**
Agenda volatility	(0.028)	(0.027)	(0.028)
Policy attention	-0.012	0.047	-0.033
Policy attention	(0.034)	(0.061)	(0.099)
Readability × Policy attention	-0.011	-0.021	-0.023
Readability × Policy attention	(0.064)	(0.063)	(0.074)
Emotional intensity × Policy attention	-0.024	-0.106**	-0.129**
Emotional intensity × Policy attention	(0.044)	(0.049)	(0.058)
Media richness × Policy attention	0.066	0.004	0.005
Media richness × Policy attention	(0.058)	(0.072)	(0.101)

Variable	(1) Three-Month Policy	(2) Six-Month Policy	(3) Tapering Policy
Agenda volatility × Policy attention	0.062	0.054	0.069
Agenda volatility × Policy attention	(0.037)	(0.037)	(0.045)
Observations	2599	2599	2599
R ²	0.724	0.725	0.725
Account fixed effects	Controlled	Controlled	Controlled
Month fixed effects	Controlled	Controlled	Controlled

Note: The policy-attention variables are all mean-centered. All models absorb account fixed effects and month fixed effects.

The policy-moderation results show that the directions of the main effects of readability, media richness, and agenda volatility are relatively stable. Policy attention itself does not appear to be a stable direct promoting factor; however, under the six-month policy and [[unclear: 表减 policy]] definitions, the interaction term between emotional intensity and policy attention is significantly negative. This indicates that when policy attention is relatively high, the marginal effect of overly strong emotional expression is more likely to weaken or turn negative. The interaction between agenda volatility and policy attention is positive, but in the revised two-way fixed-effects results it does not reach the conventional level of significance; it is therefore more appropriately interpreted as trend-based evidence rather than as a stable conclusion.

2. The Moderating Role of Macroeconomic Conditions and Digital Infrastructure

Table 12 Moderating Effects of the Macro Environment

Variable	(1) GDP	(2) Population	(3) Fiscal Rev- enue	(4) Fiscal Expen- diture	(5) Telecom Rev- enue	(6) Mobile Users	(7) Ethnic Minor- ity Areas
Readability	-0.243*** (0.0026)	-0.203*** (0.0026)	-0.223*** (0.0022)	-0.192*** (0.0019)	-0.110* (0.123)	-0.04239*** (0.0042)	0.363** (0.136)

Variable	(1)GDP	(2)Population	(3)Fiscal Rev- enue	(4)Fiscal Expen- diture	(5)Telecom Rev- enue	(6)Mobile Users	(7)Ethnic Minor- ity Areas
Emotional	-	-	-	-	-	-	-
Inten- sity	0.102*(0.056)	0.118(0.069)	0.120***(0.044)	0.148(0.100)	0.036*(0.021)	0.006(0.080)	0.022(0.172)
Media	0.177***(0.082)	0.110*(0.105)	0.192***(0.072)	0.137(0.165)	0.128***(0.042)	0.131*(0.123)	-
Rich- ness							0.215(0.130)
Agenda	-	-	-	-	-	-	0.086(0.077)
Volatil- ity	0.070*(0.041)	0.090*(0.051)	0.082***(0.031)	0.152***(0.066)	0.025(0.017)	0.113***(0.051)	
Observation	2526	2532	2532	2532	2341	2364	2599
R ²	0.724	0.724	0.725	0.724	0.736	0.736	0.725
Account	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
Fixed							
Ef- fects							
Month	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
Fixed							
Ef- fects							

Note: The table reports only the interaction terms between content features and macro-moderating variables; all models absorb account fixed effects and month fixed effects.

The macro-moderation results show that variables such as economic development, population size, fiscal revenue, and the scale of mobile users mostly have significantly negative interactions with readability, whereas their interactions with media richness are mostly positive. This implies that in regions where resources and digital infrastructure are relatively weak, the marginal returns to lowering the reading threshold are higher; in regions where the economic and media environment is more mature, multimedia presentation is more likely to become a complementary pathway for attracting attention. At the same time, emotional intensity and agenda volatility show negative interactions in some macro contexts, suggesting that audiences in more developed regions may prefer objective, stable, and professional modes of information expression.

3. Heterogeneity Analysis

Table 13 Heterogeneity test: joint test of between-group differences

Grouping variable	Readability	Emotional intensity	Media richness	Agenda volatility
Account-type clusters	<0.001***	0.005***	0.265	0.005***
Ethnic-minority regions	0.013**	0.899	0.111	0.276
Economic regions	0.033**	<0.001***	0.025**	0.004***

Note: The table reports the joint-test p -values for differences in the slopes of content features under each grouping. All models absorb account fixed effects and month fixed effects.

Table 13 reports joint tests of differences in the slopes of content features across different groupings. The results show that, under account-type clustering, the between-group differences in readability, emotional intensity, and agenda volatility are significant, indicating that accounts with different functional positioning exhibit marked differences in the returns to content strategies. Along the economic-region dimension, heterogeneity across the four types of content features is generally more pronounced. In the ethnic-minority-region dimension, the between-group difference in readability remains significant, but the differences in media richness, emotional intensity, and agenda volatility are not stable. In conjunction with Figures 6 and 7, it can be seen that content strategies do not operate in a way that is fully consistent across all accounts and regions; subsequent strategy recommendations therefore need to be differentiated according to account functional positioning and the regional communication environment.

Visible labels in Figure 6 indicate four coefficient plots with the horizontal axis labeled “regression coefficient (95% confidence interval)” :

- Readability (z_{read}): marginal driving effect.
- Media richness (z_{media}): marginal driving effect.
- Emotional intensity (z_{emo}): marginal driving effect.
- Agenda volatility (z_{vol}): marginal driving effect.

Figure 6 Heterogeneity analysis of regions and ethnic-minority regions

Figure 7. Heterogeneity analysis by account cluster

Visible panel labels and point estimates in Figure 7:

- **Marginal pull effect of readability (z_{read})**
x-axis: regression coefficient (95% confidence interval)
C0: provincial capitals and leading comprehensive publishers: 0.119; C7: coastal developed-city publishers: 0.279; C6: ordinary prefecture-level-city

publishing and government services: 0.107*; C3: northern and border-area comprehensive publishers: 0.781***; C4: government portals and mixed departments: 0.487***; C2: public security, judicial, and traffic-law-enforcement accounts: 0.614**; C1: fire and rescue: 0.469; C5: culture-tourism and brand promotion: 0.340*.

- **Marginal pull effect of media richness (z_{media})**

x-axis: regression coefficient (95% confidence interval)

C0: provincial capitals and leading comprehensive publishers: 0.311; C7: coastal developed-city publishers: 0.781***; C6: ordinary prefecture-level-city publishing and government services: 0.388; C3: northern and border-area comprehensive publishers: 0.169; C4: government portals and mixed departments: 0.106; C2: public security, judicial, and traffic-law-enforcement accounts: 0.003; C1: fire and rescue: 0.019; C5: culture-tourism and brand promotion: 0.123*.

- **Marginal pull effect of emotional intensity (z_{emo})**

x-axis: regression coefficient (95% confidence interval)

C0: provincial capitals and leading comprehensive publishers: -0.480**; C7: coastal developed-city publishers: -0.225; C6: ordinary prefecture-level-city publishing and government services: -0.221**; C3: northern and border-area comprehensive publishers: 0.325; C4: government portals and mixed departments: -0.156; C2: public security, judicial, and traffic-law-enforcement accounts: 0.137**; C1: fire and rescue: 0.360; C5: culture-tourism and brand promotion: -0.006.

- **Marginal pull effect of agenda volatility (z_{vol})**

x-axis: regression coefficient (95% confidence interval)

C0: provincial capitals and leading comprehensive publishers: -0.053; C7: coastal developed-city publishers: -0.022; C6: ordinary prefecture-level-city publishing and government services: 0.004; C3: northern and border-area comprehensive publishers: 0.290***; C4: government portals and mixed departments: 0.181**; C2: public security, judicial, and traffic-law-enforcement accounts: 0.009; C1: fire and rescue: 0.419**; C5: culture-tourism and brand promotion: 0.090.

Taken together, the results of this section show that the core findings of this paper regarding the relationship between content-expression features and residual performance are generally stable, although the degree of support for different mechanisms varies.

The baseline regressions show that, in models that control only for account fixed effects and in those that further add month fixed effects, readability consistently maintains a significantly positive relationship, while media richness and agenda volatility also exhibit positive effects to varying degrees. The robustness checks further indicate that readability and media richness remain stable across multiple specifications, whereas the significance of agenda volatility is relatively sensitive to stricter controls for common shocks. The results for moderating

effects show that policy attention itself does not constitute a stable direct promoting factor, but it does alter the marginal effects of some content features; in particular, under conditions of higher policy attention, the effect of emotional intensity is more likely to weaken or turn negative. The macro-level moderation and heterogeneity analyses further demonstrate that the effects of content strategies vary with regional development level, digital infrastructure, minority-ethnic-region attributes, and the functional positioning of accounts. Therefore, the conclusions of this paper should be understood as conditional correlations after controlling for account differences and common temporal changes, rather than as simple, homogeneous laws of communication.

VI. Discussion of Regression Results and Governance Implications

Synthesizing the preceding analysis, the empirical results of this paper present a relatively clear theoretical picture: the cognitive-cost mechanism is the most stable; the symbolic-visibility mechanism is mainly reflected in contemporaneous effects; the attention-allocation mechanism shows weak robustness; and the role of emotional symbols is constrained by the context of policy attention. Accordingly, the research hypotheses proposed in this paper are generally well validated, although the degree of support varies across hypotheses.

Specifically, H1 receives strong support. Readability is consistently and significantly positively associated with residual performance, indicating that after controlling for account fixed differences and common monthly variation, the more accessible and structurally clear a text is, the more likely it is to generate public interaction beyond conventional expectations. H2 receives contextual support. Emotional intensity does not exhibit a stable direct positive effect; moreover, when policy attention is relatively high, its effect may weaken or even turn negative. This suggests that government communication cannot simply rely on emotional mobilization, but should maintain expressive boundaries among publicness, factuality, and credibility. H3 receives contemporaneous support. Media richness significantly improves contemporaneous performance, indicating that multimedia elements help enhance content visibility and immediate appeal. H4 receives weak support. Agenda volatility is positive overall, but is sensitive to robustness specifications, suggesting that appropriately adjusting agenda structure helps sustain attention. The verification results corresponding to H5 and H6 jointly show that the effect of policy attention lies not in directly improving performance, but in moderating the effects of content strategies. In particular, when policy attention is high, the public places greater emphasis on factual explanation and action guidance, while the marginal returns of emotional expression decline. H7 is generally supported, with heterogeneity found across account type and regional dimensions. This indicates that governance of government new media cannot adopt a single standardized communication template; instead, differentiated configurations should be made according to regional resource conditions, the functional positioning of accounts, and the

public' s information needs.

On this basis, improving interaction on government microblogs should not be understood merely as a platform-operation technique, but rather as an embodiment of governmental expression and response capacity in digital-intelligent governance. Government accounts should place comprehensibility at the core, reduce jargon and abstract expression, and give priority to explaining policy objects, matters to be handled, responsible entities, and required actions. Multimedia content should serve public understanding, helping transform complex policies and public affairs into more intuitive symbolic cues. Emotional expression also needs to maintain public rationality: reminders concerning public convenience and the communication of city image may appropriately add warmth, but policy interpretation, law-enforcement notices, and emergency responses should be factually clear and restrained in tone. Especially when public attention to digital policy is relatively high, accounts should avoid substituting emotional mobilization for policy explanation, and should instead respond to public concerns through clear facts, sufficient reasoning, and specific guidance. Overall, interaction in government new media is a micro-level mechanism through which digital-intelligent technologies reshape government-public relations and grassroots governance responsiveness. The key to improving its effectiveness does not lie in manufacturing superficial excitement, but in reducing the public' s cost of understanding and improving the interactive relationship between government and the public through forms of expression that are clear, credible, easy to understand, and appropriate to the context.

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