Leadership, institutional autonomy, and cross-sector collaboration: Catalysts for change in a survey of China's public sector employees

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A B S T R A C T

Background: This study examines the relationships among leadership styles (transformational and paternalistic) and institutional autonomy, cross-sector collaboration, governance system flexibility, and decentralization within the Chinese public sector. While grounded in China's public administration, the findings contribute to broader governance theories by highlighting global mechanisms that may apply to other hierarchical and centralized administrative systems.
Method: We employed a convenience sampling approach using a sample of 1358 public employees from various government departments across major Chinese municipalities, ensuring representation across diverse regions and departments. Data were collected through a web-based survey and analyzed using descriptive statistics, correlational analyses, and regression models to test four hypotheses. Regression analysis was incorporated to establish the strength and direction of relationships between variables, strengthening the validity of the findings.
Findings: Results revealed that institutional autonomy and cross-sector collaboration were positively associated with governance system flexibility and decentralization, supporting Hypotheses 1 and 2. Transformational and paternalistic leadership partially mediated these relationships, supporting Hypotheses 3 and 4. The regression results reinforced these associations, demonstrating that leadership styles are significant but partial mediators between institutional structures and governance outcomes.
Conclusions: These findings underscore the importance of autonomy, collaboration, and leadership styles in fostering adaptable and decentralized governance systems in the public sector. Beyond the Chinese context, these insights may inform governance reforms in other centralized administrative settings, such as those found in transitional economies or large-scale bureaucratic institutions. The study's implications, limitations, and suggestions for future research are discussed, with recommendations for cross-national studies to further validate and expand on these findings.

1. Introduction

China's public administration is undergoing significant changes to meet the demands of a rapidly evolving social and economic landscape (Meng, 2024). As the government faces complex challenges from economic modernization, urbanization, and increasing citizen expectations, the need for more adaptive, flexible, and decentralized governance structures has become increasingly evident (Zayats et al., 2024). Within this context, key factors such as institutional autonomy (the capacity of public organizations to make independent decisions), cross-sector collaboration (cooperative governance across government agencies, businesses, and civil society), and leadership styles—particularly transformational and paternalistic leadership—play a critical role in shaping governance adaptability (Guan et al., 2007). However, how

these factors interact within China's governance framework remains underexplored.

This study examines the interplay between institutional autonomy, cross-sector collaboration, and leadership styles in influencing governance flexibility and decentralization, thereby addressing a critical gap in the literature on public sector adaptability in China. Specifically, this research seeks to answer the following questions: (1) How does institutional autonomy contribute to governance flexibility in China's public administration? (2) What role does cross-sector collaboration play in decentralization efforts? (3) How do transformational and paternalistic leadership styles influence these governance mechanisms? This study contributes to the broader theoretical discourse on public administration by bridging insights from organizational theory, leadership studies, and governance research in the Chinese context by exploring these

questions.

The potential benefits of this research are significant for China's public administration, as it provides a theoretically grounded framework for understanding how institutional and leadership dynamics contribute to governance innovation. By clarifying the impact of institutional autonomy and cross-sector collaboration on governance flexibility and decentralization, the findings may inform policies and management strategies to enhance public sector responsiveness (Hsu, 2004). Additionally, by analyzing the role of transformational and paternalistic leadership styles, this study highlights approaches that may help public administrators navigate the complexities of governance while ensuring alignment with local needs and national priorities. Ultimately, this research aims to advance theoretical and practical understanding of how leadership and structural mechanisms drive a more adaptive, efficient, and citizen-centered public administration in China.

2. Literature review and hypotheses development

2.1. Institutional autonomy and governance flexibility

Institutional autonomy, the degree to which an organization can operate independently and adapt to its environment, is foundational to enabling flexible and responsive governance (Caló et al., 2024). In China, autonomy is granted to public institutions and local governments but remains embedded within a centralized administrative structure where decision-making authority ultimately aligns with state directives (Goodman, 2023). While decentralization in Western systems implies significant delegation of authority, local discretion is conditional in China and often exercised within well-defined political and policy constraints (Zhang, 2023).

Autonomy allows organizations to tailor their structures to specific demands (Raziq et al., 2024), facilitating decentralized governance models better suited to rapidly changing contexts (Lin & Zhou, 2022). Barth explored how government agencies balance competing institutional norms, demonstrating that autonomy enhances flexibility in managing governance tensions—an essential aspect of decentralization (Barth, 1995). Bach (2014) further highlights that increased independence and resource-generating capabilities in German and Norwegian government agencies enhance managerial flexibility, making it easier to implement decentralized governance practices. However, in China, local autonomy remains constrained by the state's broader political objectives, meaning that flexibility is permitted within a structured framework rather than as an independent governance mechanism (Liou, 2024).

This dynamic means that institutional autonomy alone does not automatically lead to decentralization but must be complemented by effective leadership and cross-sector collaboration, which facilitate adaptation within the parameters of state oversight.

Therefore, we hypothesize:

H1. Institutional autonomy positively influences governance system flexibility and decentralization.

2.2. Cross-sector collaboration in China's state-driven governance system

Cross-sector collaboration, or partnerships across public, private, and nonprofit sectors, fosters governance innovation and adaptability. Unlike in Western democracies, where cross-sector collaboration often emerges from market-driven cooperation, in China, the state plays a dominant role in shaping and overseeing collaborative governance efforts (Zhang & Guo, 2021). Collaborative governance pools diverse resources and perspectives, enhancing a system's capacity to respond to multi-stakeholder challenges. Chen et al. (2023) find that state-led collaborations in China's environmental policy domain have achieved measurable policy successes, highlighting the effectiveness of structured intergovernmental partnerships.

Brooks and Katalin (2021) examine the LEADER Program, showing that collaborative frameworks at the local level promote autonomy and flexibility, reinforcing collaboration's role in decentralized governance. Similarly, Liu et al. (2018) demonstrate that government funding is crucial in fostering cooperation between knowledge-based organizations in China's renewable energy sector. These findings reinforce the idea that, within China, collaboration is not purely voluntary but strategically designed to align with national development goals.

Importantly, the relationship between autonomy and collaboration is bidirectional—autonomous agencies are better positioned to establish cross-sector partnerships. In contrast, collaboration enhances an institution's capacity to act flexibly within centralized governance structures.

Based on these insights, we propose:

H2. Cross-sector collaboration positively influences governance system flexibility and decentralization.

2.3. The role of leadership in bridging autonomy, collaboration, and governance outcomes

Leadership is crucial in linking institutional autonomy and cross-sector collaboration with governance outcomes. In China, where governance structures are hierarchical, leadership styles determine how effectively autonomous institutions and cross-sector partnerships function within centralized policy frameworks (Hu, 2024). Transformational leadership, in particular, is characterized by vision, motivation, and adaptability, enabling leaders to foster environments where institutional flexibility and cross-sector cooperation thrive (Bass, 2006). Transformational leaders create environments where team members are empowered to participate actively in decision-making, which enhances organizational adaptability (Wong, 2024). However, within China's governance system, transformational leadership does not equate to full autonomy in decision-making but enables bureaucratic adaptability within structured constraints (Li & Huang, 2024). Abbas et al. (2024) emphasize that transformational leadership plays a crucial role in organizational change processes, fostering engagement and proactive governance while maintaining stability.

Thus, we hypothesize:

H3. Transformational leadership mediates the relationship between institutional autonomy and cross-sector collaboration on the one hand and governance system flexibility and decentralization on the other.

Paternalistic leadership, which combines authority with protective oversight (Lau et al., 2019), presents an alternative governance model within China's hierarchical administrative framework (Huang et al., 2024). Unlike transformational leaders, paternalistic leaders maintain a strong, centralized decision-making role but facilitate governance flexibility by ensuring adaptability within structured frameworks (Huang et al., 2021). Liu et al. (2024) illustrate how paternalistic leadership in China's public sector fosters trust and coordination, particularly in urban governance contexts, allowing local governments to balance state mandates with localized decision-making.

Based on these observations, we hypothesize:

H4. Paternalistic leadership mediates the relationship between institutional autonomy and cross-sector collaboration on the one hand and governance system flexibility and decentralization on the other.

Fig. 1 displays the conceptual model for this study, with the proposed hypotheses. (See Table 1.)

3. Method

3.1. Participants

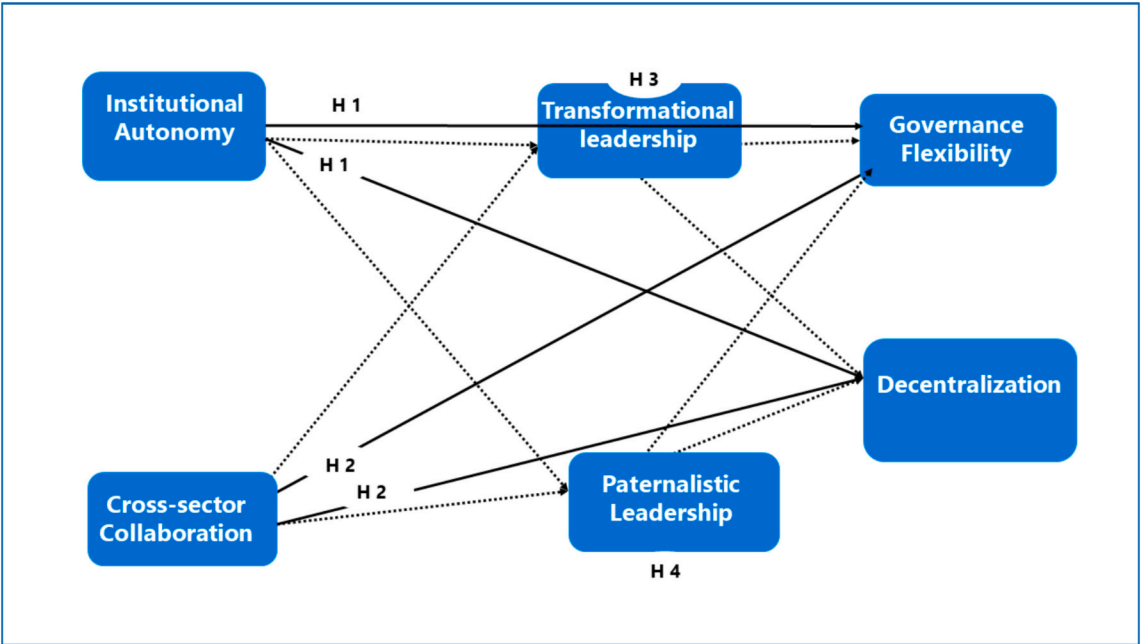The sample comprised 1358 public employees from various

Fig. 1. Conceptual model and proposed hypotheses.

Table 1
Sample characteristics.

Demographic Variable	Category	n (%)
Gender	Male	697 (51.3)
	Female	661 (48.7)
Age (Mean, SD)	–	39.63 (10.66)
Educational Level	High School	136 (10.0)
	College Degree	407 (30.0)
	Master's/PhD	815 (60.0)
Occupational Sector	Health Services	268 (19.7)
	Industrial Engineering	107 (7.9)
	Public Security	111 (8.2)
	Education	113 (8.3)
	Administrative Roles	120 (8.8)
	Housing	82 (6.0)
	Other (Finance, Environment, etc.)	557 (41.1)
Municipal Departments	Shanghai Municipal Education	223 (16.4)
	Shanghai Municipal Health	109 (8.0)
	Wuhan Municipal Development Department	138 (10.2)
	Wuhan Bureau of Finance	98 (7.2)
	Chongqing Commission of Housing & Urban Dev.	147 (10.8)
	Chongqing Bureau of Ecology	186 (13.7)
	Shenyang Bureau of Public Security	126 (9.3)
	Shenyang Bureau of Human Resources & Social Sec.	119 (8.8)
	Other Departments (various)	212 (15.6)

Participants reported an average organizational tenure of 21.63 years (SD = 10.66), ranging from 2 to 45 years, indicating a wide range of experience levels within the sample.

In terms of educational attainment, the majority of participants held advanced degrees. Specifically, 10 % had completed high school, 30 % had finished college, and 60 % held a Master's or Ph.D. degree. The high percentage of participants with advanced degrees reflects China's emphasis on educational qualifications in public administration. Research indicates that China's civil service system prioritizes highly educated professionals, especially in governance-related roles, as a strategy to improve administrative efficiency and policy implementation (Liou, 2024). Senior public employees often hold postgraduate qualifications due to national policies requiring competitive examinations and advanced training for career advancement (Han & Zhang, 2024).

Participants were drawn from a wide range of occupational fields within the public sector. The largest representation was from health services (268 participants, 19.7 %), followed by industrial engineering (107 participants, 7.9 %), public security (111 participants, 8.2 %), education (113 participants, 8.3 %), administrative roles (120 participants, 8.8 %), and housing (82 participants, 6.0 %). Additional fields included environmental services, finance, social security, psychology, and various technical and administrative roles, reflecting the diversity of functions within the Chinese public sector. The sample characteristics are presented in a table:

3.2. Data collection and sampling procedure

This study adhered to ethical and legal standards in social science research, fully complying with the Chinese Personal Information Protection Law (PIPL), which regulates the collection, processing, and protection of personal data in research involving Chinese citizens. Ethical approval was obtained from the Ethics Committee of [masked for review], which reviewed the study design to ensure adherence to human research standards and data privacy regulations, with an Approval number [masked for review]. Before participation, respondents provided informed consent electronically, acknowledging the study's purpose, their right to withdraw, and the confidentiality of their responses.

Data was collected through a web-based survey tool, Wenjuanxing, a widely used and secure platform for academic research in China. The

government departments across multiple Chinese municipalities. Participants were selected based on their active employment status in government agencies and their involvement in decision-making processes. This ensured that the sample was representative of individuals directly engaged in governance-related activities. The study focused on mid- to senior-level public employees, who are most likely to influence policy implementation, administrative decision-making, and interdepartmental collaboration.

The average age of participants was 39.63 (SD = 10.66), with ages ranging from 20 to 63. The gender distribution was approximately balanced, with 697 males (51.3 %) and 661 females (48.7 %).

survey link was distributed via multiple channels, including institutional networks, WeChat groups, and professional associations, ensuring accessibility among public sector employees from diverse administrative backgrounds.

A convenience sampling procedure was employed to gather responses from key government departments across four major municipalities, selected to represent different geographical regions in China. The municipalities included Shanghai (East China), Wuhan (Central China), Chongqing (West China), and Shenyang (Northeast China). Within each municipality, two major government departments were chosen to capture variations in governance functions, ensuring representation from education, public security, urban development, and finance. In addition, employees from other municipal departments were also invited to participate and account for potential variations in responses.

The data produced for this study are available to readers at OSF: https://osf.io/8z9rq/?view_only=8a3d3193d70d43998ca3aa7e5f0f5e12

(this anonymized link operates during the review. Then, it will be made public).

While probability sampling was not feasible due to access constraints in Chinese public institutions, efforts were made to increase sample diversity by including employees from multiple municipalities and administrative sectors. This approach allowed for a broad representation of different governance functions, enhancing the study's ability to capture perspectives from various administrative roles. However, the use of convenience sampling introduces limitations in generalizability. While the diversity of municipalities and public sector roles strengthens the sample's representativeness, convenience sampling means that findings should be interpreted with caution when extending conclusions to the broader Chinese public sector. Future studies should consider stratified or probability sampling approaches to improve generalizability.

3.3. Measures

Each measure was adapted for the Chinese context to ensure cultural and linguistic appropriateness. All survey items were translated into Chinese using the back-translation method, following established guidelines for cross-cultural research (Brislin, 1970). This approach ensured conceptual equivalence between the original and translated items, reducing the risk of misinterpretation by respondents.

Institutional Autonomy was measured using items adapted from Verhoest et al. (2004). The original study discusses dimensions of organizational autonomy, focusing on organizations' control and discretion in decision-making. The following items were used:

"I have significant decision-making authority in my role."

"My department has flexibility in allocating resources."

"I can exercise discretion in implementing procedures."

Cross-Sector Collaboration. The Cross-Sector Collaboration construct was operationalized using items based on Thomson et al. (2009), which examine governance, administrative practices, and organizational autonomy within collaborative environments. Respondents were asked to indicate the extent of their organization's collaboration behaviors and attitudes, using the following items: "My organization relies on a formal agreement that spells out relationships between partner organizations.; "Partner organizations (including my organization) agree about the goals of the collaboration," and "My organization would be hurt if it decided to pull out of the collaboration today."

Governance System Flexibility. The items for Governance System Flexibility were adapted from Verhoest et al. (2004), who discuss flexibility and adaptability as essential components of organizational autonomy. The construct was measured using three items to capture governance systems' capacity to respond to changes efficiently: "There is minimal bureaucratic red tape in my organization." (reverse-coded), "My department adapts quickly to environmental changes," and "Decision-making processes in my organization are fast and efficient."

Decentralization was measured using items based on Aiken and Hage

(1968), focusing on the extent of employee participation and coordination within the organization. The following items were used to assess this construct: "Lower-level employees participate in decision-making in my organization." "There are effective horizontal coordination mechanisms in place." "I feel empowered to make decisions in my role."

Transformational Leadership was measured using six items from the Multifactor Leadership Questionnaire (MLQ-5×) developed by Bass et al. (1996), with the Chinese version of Chaoping and Kan (2008). Examples of items are: "My leader articulates a compelling vision for the future."; "My leader encourages me to think outside the box.", and "My leader exemplifies high ethical standards."

Paternalistic Leadership. The Paternalistic Leadership was assessed using a specific Chinese scale (Cheng et al., 2004; Cheng et al., 2010). These items measure three distinct paternalistic leadership elements: benevolent, moral, and authoritarian. The scale uses a five-point Likert scale ranging from 1 ("strongly disagree") to 5 ("strongly agree"). The items are: Benevolent leadership: "My supervisor is like a family member when he/she gets along with us." Moral leadership: "My supervisor does not take advantage of me for personal gain." Authoritarian leadership: "My supervisor asks me to obey his/her instructions completely."

3.4. Data analytic strategy

All analyses were conducted using statistical software suitable for SEM and advanced correlational analysis. The data preparation, descriptive statistics, and correlation analyses were performed in SPSS. In contrast, the measurement and structural model analyses were conducted in a specialized SEM software, Smart PLS 4 (Ringle et al., 2024), to ensure accuracy and reliability in testing the complex relationships among variables. SEM was chosen because it allows for the simultaneous estimation of multiple relationships between latent constructs, making it a suitable method for investigating the complex interactions in this study. Given that the research explores direct and indirect relationships, including mediation effects, SEM provides a robust statistical framework to examine these connections holistically.

One of SEM's main advantages is its ability to test multiple relationships simultaneously while accounting for measurement error in latent variables (Han & Zhang, 2024). This is particularly relevant to this study, as the model includes institutional autonomy, cross-sector collaboration, governance flexibility, decentralization, and leadership styles, all of which are interrelated. Unlike traditional regression analysis, which typically examines relationships in isolation, SEM enables a more comprehensive evaluation of how these variables interact within the governance system.

Additionally, SEM is particularly well-suited for analyzing mediation effects, which are central to this research. Transformational and paternalistic leadership are hypothesized to mediate the relationships between institutional autonomy, cross-sector collaboration, and governance flexibility. Using SEM, the study can simultaneously assess direct and indirect effects, offering deeper insights into how leadership styles influence governance structures.

While SEM is a powerful analytical tool, it is important to acknowledge its limitations. One of the primary concerns is that SEM assumes linear relationships between variables, which may not fully capture the complexity of governance dynamics. In real-world governance systems, interactions between institutional autonomy, collaboration, and decentralization may exhibit non-linear or feedback-loop effects that cannot be easily modeled using SEM.

Moreover, SEM requires careful model specification, including appropriate selection of measurement indicators and validation of fit indices. This study conducted extensive reliability and validity testing to ensure robustness, including Cronbach's alpha, composite reliability (rho_c), and average variance extracted (AVE). Discriminant validity was also assessed using the Heterotrait-Monotrait (HTMT) ratio and the Fornell-Larcker criterion.

By integrating rigorous validation procedures, this study strengthens

the SEM approach's reliability while recognizing the method's inherent assumptions and constraints. Future research may consider alternative analytical techniques, such as non-linear modeling or dynamic systems analysis, to further investigate governance complexities beyond what SEM can capture.

4. Results

4.1. Descriptive and correlational analyses

Descriptive statistics were calculated to provide an overview of the main study variables, including institutional autonomy, cross-sector collaboration, leadership styles, governance flexibility, and decentralization. As shown in Table 2, participants reported moderate levels of institutional independence and cross-sector collaboration, indicating that while some degree of autonomy is perceived, there is still room for improvement in decision-making flexibility and inter-sectoral cooperation.

Perceptions of transformational and paternalistic leadership were relatively low, suggesting that participants observed only moderate levels of visionary leadership and paternalistic behaviors (authoritative guidance combined with care and support). Similarly, governance flexibility and decentralization were rated at moderate levels, indicating that participants perceived their governance systems as somewhat adaptable and decentralized but not highly so.

4.1.1. Correlation analysis and leadership overlap

Pearson correlation analyses revealed significant relationships among the key study variables. Institutional autonomy was positively associated with cross-sector collaboration, transformational leadership, paternalistic leadership, governance flexibility, and decentralization. This suggests that higher levels of autonomy correspond with stronger collaborative engagement, leadership behaviors, and governance adaptability.

Cross-sector collaboration was positively linked to governance flexibility and decentralization, reinforcing that when sectors work together more effectively, governance structures become more adaptable and decentralized. Transformational leadership showed moderate positive correlations with governance flexibility and decentralization, confirming its potential role in enhancing adaptability and decentralized decision-making.

Notably, paternalistic leadership was also significantly associated with governance flexibility and decentralization, though the correlation was weaker than transformational leadership.

4.1.2. Testing for normality and common method bias

To ensure the robustness of the findings, tests for normality and common method bias (CMB) were conducted. Normality was assessed using skewness and kurtosis values for all key study variables, which fell within the acceptable range of ± 2 (Tabachnick et al., 2013), indicating that the data approximated a normal distribution. However, it is important to note that Smart PLS-SEM does not assume normality; therefore, this analysis was conducted for descriptive purposes rather than as a prerequisite for model estimation.

Harman's single-factor test was performed to address potential

Table 3
Measurement model – reliability and validity indicators.

Construct	Cronbach's α	rho_a	rho_c	AVE	Cross-Loadings (Range)
Cross-Sector Collaboration	0.894	0.894	0.934	0.825	0.891–0.923
Decentralization	0.650	0.727	0.807	0.586	0.633–0.882
Governance Flexibility	0.762	0.783	0.864	0.682	0.714–0.893
Institutional Autonomy	0.857	0.863	0.913	0.778	0.852–0.919
Paternalistic Leadership	0.811	0.857	0.886	0.722	0.772–0.887
Transformational Leadership	0.883	0.897	0.911	0.633	0.694–0.872

Note: AVE = Average Variance Extracted. All constructs meet the reliability thresholds (α > 0.7, AVE > 0.5).

common method bias (CMB). The results indicated that the first unrotated factor accounted for <50 % of the total variance, suggesting that common method variance was not a significant concern (Podsakoff et al., 2003). In addition, a marker variable technique was applied as a second check for CMB, confirming that CMB did not substantially influence the results.

By incorporating these tests, this study ensures methodological rigor and enhances confidence in the validity of the findings.

4.2. Measurement model

The measurement model was evaluated through assessments of construct reliability, convergent validity, discriminant validity, and outer loadings to confirm the quality of the constructs used in the analysis. Construct reliability was examined using Cronbach's alpha and composite reliability measures (rho_a and rho_c). Each construct surpassed the recommended threshold of 0.7 for Cronbach's alpha, ensuring internal consistency across items. For instance, Cross-Sector Collaboration achieved a Cronbach's alpha of 0.894, Decentralization recorded 0.650, Governance Flexibility yielded 0.762, Institutional Autonomy reached 0.857, Paternalistic Leadership scored 0.811, and Transformational Leadership showed 0.883. Composite reliability values also exceeded the recommended threshold, with rho_c values for all constructs above 0.8, further supporting construct reliability.

Convergent validity was assessed using the Average Variance Extracted (AVE), with all constructs achieving AVE values above the minimum threshold of 0.5. This outcome signifies that the constructs explain a substantial portion of the variance in their indicators. Specifically, Cross-Sector Collaboration, Institutional Autonomy, and Paternalistic Leadership exhibited high AVE values of 0.825, 0.778, and 0.722, respectively. Although Decentralization recorded a lower AVE of 0.586, it remains within acceptable limits, suggesting adequate convergent validity across all constructs, as shown in Table 3.

Discriminant validity was evaluated using the Heterotrait-Monotrait Ratio (HTMT) and the Fornell-Larcker criterion. Most constructs achieved HTMT values below the conservative threshold of 0.85, confirming sufficient discriminant validity. For example, HTMT values between Cross-Sector Collaboration and Decentralization, Governance

Table 2
Descriptive statistics and correlations for key study variables *(N = 1358)*.

Variable	Mean	SD	1	2	3	4	5	6
1. Institutional Autonomy	2.60	0.90	–					
2. Cross-Sector Collaboration	3.02	0.86	0.505**	–				
3. Transformational Leadership	2.11	0.98	0.436**	0.314**	–			
4. Paternalistic Leadership	1.92	1.09	0.378**	0.290**	0.865**	–		
5. Governance Flexibility	2.77	0.77	0.390**	0.605**	0.312**	0.289**	–	
6. Decentralization	2.69	0.73	0.354**	0.508**	0.249**	0.216**	0.789**	–

Note. SD = Standard Deviation.

Flexibility, and Institutional Autonomy were 0.668, 0.732, and 0.576, respectively, all within acceptable limits. However, the HTMT value between Transformational and Paternalistic Leadership was slightly above the threshold at 1.019, suggesting a potential overlap between these constructs that may require cautious interpretation. The Fornell-Larcker criterion analysis further supported discriminant validity, as the square roots of the AVE values for each construct were greater than their correlations with other constructs, as Table 4 shows.

Outer loadings for each indicator on its respective construct were examined to verify indicator reliability. Most indicators demonstrated strong loadings on their respective constructs, generally above the recommended threshold of 0.7. Although Transformational Leadership items generally displayed acceptable loadings (e.g., at 0.872 and 0.846, respectively), only one item (TL5 < - Transformational) showed a slightly lower loading of 0.694, which is still within acceptable limits but suggests potential refinement in future research. By incorporating this table, we ensure that all factor loadings are transparently reported and aligned with best practices in SEM modeling, as Table 5 shows.

The Variance Inflation Factor (VIF) values were examined to assess multicollinearity. In the outer model, VIF values for all indicators were below the threshold of 5, indicating no multicollinearity issues were present among the indicators. In the inner model, VIF values for relationships among constructs were also below 5, except for Transformational and Paternalistic Leadership, where values of 4.241 and 3.987 approached the upper limit but remained within acceptable limits. This suggests that multicollinearity is not a significant concern in this model, allowing for reliable estimation of the structural paths.

4.3. Structural model

We evaluated path coefficients, indirect and total effects, model fit, and quality criteria to assess the structural model and test the proposed hypotheses. Model fit was assessed using multiple indices to evaluate the structural relationships comprehensively.

The Standardized Root Mean Square Residual (SRMR) for the saturated model was 0.066, which falls below the acceptable threshold of 0.08, indicating that the proposed model structure demonstrates a good fit. However, the SRMR for the estimated model was 0.152, which exceeds the recommended threshold, suggesting that the estimated relationships may require refinement to improve model fit.

The Normed Fit Index (NFI) was 0.811 for the saturated model and 0.707 for the estimated model, reflecting a moderate structural model fit. Additionally, the chi-square values for the saturated and estimated models were 3331.121 and 5155.674, respectively. While the chi-square statistic is often significant in large samples, it should be interpreted alongside other fit indices to provide a more balanced assessment of model adequacy.

These fit indices indicate that the model generally aligns with the observed data, although the estimated relationships could be further refined to enhance fit. The detailed model fit indices are presented in Table 6.

Table 4
Discriminant validity fornell-larcker criterion.

Constructs	1	2	3	4	5	6
1. Cross-Sector Collaboration	0.908	0.528	0.607	0.506	0.302	0.336
2. Decentralization	0.528	0.766	0.691	0.431	0.231	0.282
3. Governance Flexibility	0.607	0.691	0.826	0.392	0.298	0.329
4. Institutional Autonomy	0.506	0.431	0.392	0.882	0.391	0.449
5. Paternalistic	0.302	0.231	0.298	0.391	0.850	0.865
6. Transformational	0.336	0.282	0.329	0.449	0.865	0.795

Note: Diagonal values (in bold) represent the square roots of AVE for each construct. These values should be greater than the correlations (off-diagonal values) in their respective rows and columns for adequate discriminant validity. The results indicate acceptable discriminant validity across constructs.

Table 5
Outer loadings for measurement model.

Indicator	Outer Loadings
TL1 ← Transformational	0.823
TL2 ← Transformational	0.708
TL3 ← Transformational	0.872
TL4 ← Transformational	0.846
TL5 ← Transformational	0.694
TL6 ← Transformational	0.812
PL4 ← Paternalistic	0.885
PL5 ← Paternalistic	0.887
PL6 ← Paternalistic	0.772
GF1 ← Governance Flexibility	0.714
GF2 ← Governance Flexibility	0.859
GF3 ← Governance Flexibility	0.893
DC1 ← Decentralization	0.882
DC2 ← Decentralization	0.633
DC3 ← Decentralization	0.761
IA1 ← Institutional Autonomy	0.873
IA2 ← Institutional Autonomy	0.919
IA3 ← Institutional Autonomy	0.852
CC1 ← Cross-Sector Collaboration	0.910
CC2 ← Cross-Sector Collaboration	0.923
CC3 ← Cross-Sector Collaboration	0.891

Note: Outer loadings >0.7 indicate strong item reliability.

Table 6
Model fit.

Model Fit Statistics	Saturated Model	Estimated Model
SRMR (Standardized Root Mean Square Residual)	0.066	0.152
d_ULS	0.998	5.307
d_G	0.410	0.841
Chi-square	3331.121	5155.674
NFI (Normed Fit Index)	0.811	0.707

4.4. Path coefficients and hypotheses testing

The structural relationships among constructs were examined using path coefficients, as Table 7 shows.

The structural relationships among constructs were examined using path coefficients, effect sizes, t-values, and statistical significance, as presented in Table 7. The findings reveal strong and moderate relationships between key governance constructs, confirming most hypothesized effects while highlighting areas where relationships were weaker or non-significant.

Institutional Autonomy was expected to influence Governance Flexibility and Decentralization (Hypothesis 1) positively. The path coefficients indicate that Institutional Autonomy significantly predicted Decentralization ($\beta = 0.199$, $t = 6.361$, $p < .01$), supporting this hypothesis. However, the effect of Institutional Autonomy on Governance Flexibility was weaker than anticipated ($\beta = 0.053$, non-significant), suggesting that while autonomy contributes to decentralization, its impact on governance flexibility may be more complex or mediated by additional factors.

Hypothesis 2 proposed that Cross-Sector Collaboration positively influences Governance Flexibility and Decentralization. The results provide strong support for this hypothesis, with Cross-Sector Collaboration showing a substantial positive relationship with Governance Flexibility ($\beta = 0.560$, $t = 26.396$, p < .01) and Decentralization ($\beta = 0.410$, $t = 15.236$, p < .01). These findings suggest that greater collaboration across sectors is strongly associated with governance structures that are both more flexible and decentralized.

Further, Cross-Sector Collaboration exhibited small but significant effects on Paternalistic Leadership ($\beta = 0.140$, $t = 4.232$, p < .01) and Transformational Leadership ($\beta = 0.147$, $t = 4.902$, p < .01). These results indicate that higher collaboration levels slightly enhance both

Table 7
Structural model – Path Coefficients, Effect Sizes, t values, and statistical significance.

Path	Coefficient	f²	t	Interpretation
Cross-Sector Collaboration → Decentralization	0.410	0.180	15.236**	Moderate Positive
Cross-Sector Collaboration → Governance Flexibility	0.560	0.453	26.396**	Strong Positive
Cross-Sector Collaboration → Paternalistic	0.140	0.018	4.232**	Small Positive
Cross-Sector Collaboration → Transformational	0.147	0.021	4.902**	Small Positive
Institutional Autonomy → Decentralization	0.199	0.038	6.361**	Small Positive
Institutional Autonomy → Paternalistic	0.320	0.092	9.705**	Moderate Positive
Institutional Autonomy → Transformational	0.375	0.134	12.187**	Moderate Positive
Paternalistic → Decentralization	−0.071	0.002	1.555	Small Negative
Paternalistic → Governance Flexibility	0.026	0.000	0.579	Negligible Positive
Transformational → Decentralization	0.116	0.005	2.413*	Small Positive
Transformational → Governance Flexibility	0.118	0.006	2.479*	Small Positive

Note: f² values indicate effect size: $0.02 = $ small, $0.15 = $ medium, $0.35 = $ large.
** $p < .01$.
* $p < .05$.

leadership styles, suggesting a role for inter-organizational cooperation in shaping leadership behaviors within governance structures.

The effects of leadership styles on governance outcomes yielded mixed results. Transformational Leadership had small but significant positive associations with Decentralization ($\beta = 0.116$, $t = 2.413$, $p < .05$) and Governance Flexibility ($\beta = 0.118$, $t = 2.479$, $p < .05$), supporting its role in fostering more adaptable and decentralized governance systems. In contrast, Paternalistic Leadership was not significantly related to Governance Flexibility ($\beta = 0.026$, $t = 0.579$, non-significant) and even showed a small negative, non-significant effect on Decentralization ($\beta = -0.071$, $t = 1.555$). These findings suggest that while transformational leadership contributes to decentralization and flexibility, paternalistic leadership may be less effective in promoting these governance outcomes.

Taken together, these results strongly support the positive role of Institutional Autonomy and Cross-Sector Collaboration in driving governance adaptability while highlighting that leadership styles influence governance outcomes differently, with transformational leadership playing a more favorable role than paternalistic leadership.

4.4.1. Mediation and model evaluation

Hypothesis 3 proposed that Transformational Leadership mediates the relationships between Institutional Autonomy and Cross-Sector Collaboration on one side and Governance Flexibility and Decentralization on the other. The results confirm a moderate positive influence of Transformational Leadership on governance outcomes, with a path coefficient of 0.116 for Decentralization and 0.118 for Governance Flexibility.

The indirect effect of Institutional Autonomy on Governance Flexibility through Transformational Leadership was 0.044 ($t = 2.397$, $p < .05$), supporting the mediating role of transformational leadership in strengthening governance flexibility. Additionally, Cross-Sector Collaboration had an indirect effect of 0.017 ($t = 2.156$, $p < .05$) on Governance Flexibility through Transformational Leadership, emphasizing its role in facilitating collaborative governance structures. These findings partially support Hypothesis 3, indicating that Transformational Leadership helps bridge Institutional Autonomy and Cross-Sector Collaboration with governance flexibility and decentralization, as shown in Table 8.

Hypothesis 4 suggests that Paternalistic Leadership mediates the relationships between Institutional Autonomy and Cross-Sector Collaboration on one side and Governance Flexibility and Decentralization on the other. However, the results indicate a nuanced effect of Paternalistic Leadership, with a negative path coefficient for Decentralization (−0.071) and a slightly positive but negligible effect on Governance Flexibility (0.026, non-significant).

The specific indirect effects analysis revealed that Institutional Autonomy's influence on Decentralization through Paternalistic Leadership was −0.023 ($t = 1.506$, non-significant), suggesting a partial mediation effect, but in the opposite direction than expected. Similarly, Cross-Sector Collaboration's indirect effect on Decentralization through Paternalistic Leadership was −0.010 ($t = 1.436$, non-significant). These findings partially support Hypothesis 4, as Paternalistic Leadership does not consistently facilitate governance decentralization or flexibility, and its role depends on contextual factors.

The analysis of indirect effects provided further insights into mediation mechanisms. Cross-sector collaboration exhibited a total indirect effect of 0.021 on Governance Flexibility, with specific indirect effects of 0.017 through Transformational Leadership and 0.004 through Paternalistic Leadership. Similarly, Institutional Autonomy had an indirect effect of 0.053 on Governance Flexibility through both Transformational and Paternalistic Leadership, reinforcing the importance of leadership styles in shaping governance adaptability within autonomous and collaborative systems.

R-square values were examined for each endogenous construct to evaluate the model's explanatory power. The results indicate moderate predictive capability, with Decentralization ($R^2 = 0.319$), Governance Flexibility ($R^2 = 0.387$), Paternalistic Leadership ($R^2 = 0.168$), and Transformational Leadership ($R^2 = 0.218$). These values suggest that Institutional Autonomy and Cross-Sector Collaboration contribute meaningfully to explaining governance flexibility and decentralization, though additional factors may also play a role.

Finally, f-square values were calculated to determine the effect sizes of key relationships. The cross-sector collaboration had a large effect size on Governance Flexibility ($f^2 = 0.453$) and a moderate effect on Decentralization ($f^2 = 0.180$). Institutional Autonomy exhibited a smaller effect size on Paternalistic Leadership ($f^2 = 0.092$) and Transformational Leadership ($f^2 = 0.134$), indicating that leadership styles partially mediate Institutional Autonomy's effects on governance outcomes. These effect sizes reinforce the significance of Cross-Sector Collaboration and Institutional Autonomy in influencing governance adaptability.

In summary, the structural model supports the proposed relationships, as Fig. 2 displays, with cross-sector collaboration and institutional autonomy significantly influencing governance system flexibility and decentralization. Transformational and Paternalistic Leadership serve as mediators in these relationships, although the effect of Paternalistic Leadership on Decentralization was unexpectedly negative. These findings underscore the importance of collaboration, autonomy, and leadership style in fostering adaptive governance structures.

5. Discussion

The present study offers insights into the dynamics of Institutional Autonomy, Cross-Sector Collaboration, and Leadership styles within China's public administration. While the study's findings generally align with the proposed hypotheses, several results warrant closer attention.

5.1. Institutional autonomy and governance outcomes

Institutional Autonomy was expected to enhance Governance Flexibility and Decentralization, but the findings partially support this hypothesis. While autonomy promotes decentralized decision-making, its impact on flexibility is more limited.

The positive association between Institutional Autonomy and

Table 8
Model Fit, Indirect, and Total Effects

Indirect Effects.	Coefficient	t	Total Effects	Coefficient	t
Cross-Sector Collaboration → Transformational → Decentralization	0.017	2.082*	Cross-Sector Collaboration → Decentralization	0.417	15.547**
Cross-Sector Collaboration → Paternalistic → Decentralization	−0.010	1.436	Cross-Sector Collaboration → Governance Flexibility	0.581	29.147**
Institutional Autonomy → Transformational → Decentralization	0.044	2.341*	Institutional Autonomy → Decentralization	0.220	7.723**
Institutional Autonomy → Paternalistic → Decentralization	−0.023	1.506	Institutional Autonomy → Governance Flexibility	0.053	5.314**
Cross-Sector Collaboration → Transformational → Governance Flexibility	0.017	2.156*	Cross-Sector Collaboration → Paternalistic	0.140	4.232**
Institutional Autonomy → Transformational → Governance Flexibility	0.044	2.397*	Institutional Autonomy → Transformational	0.375	12.187**

Note: Only Significant indirect effects are shown. Total effects represent the combined direct and indirect effects.
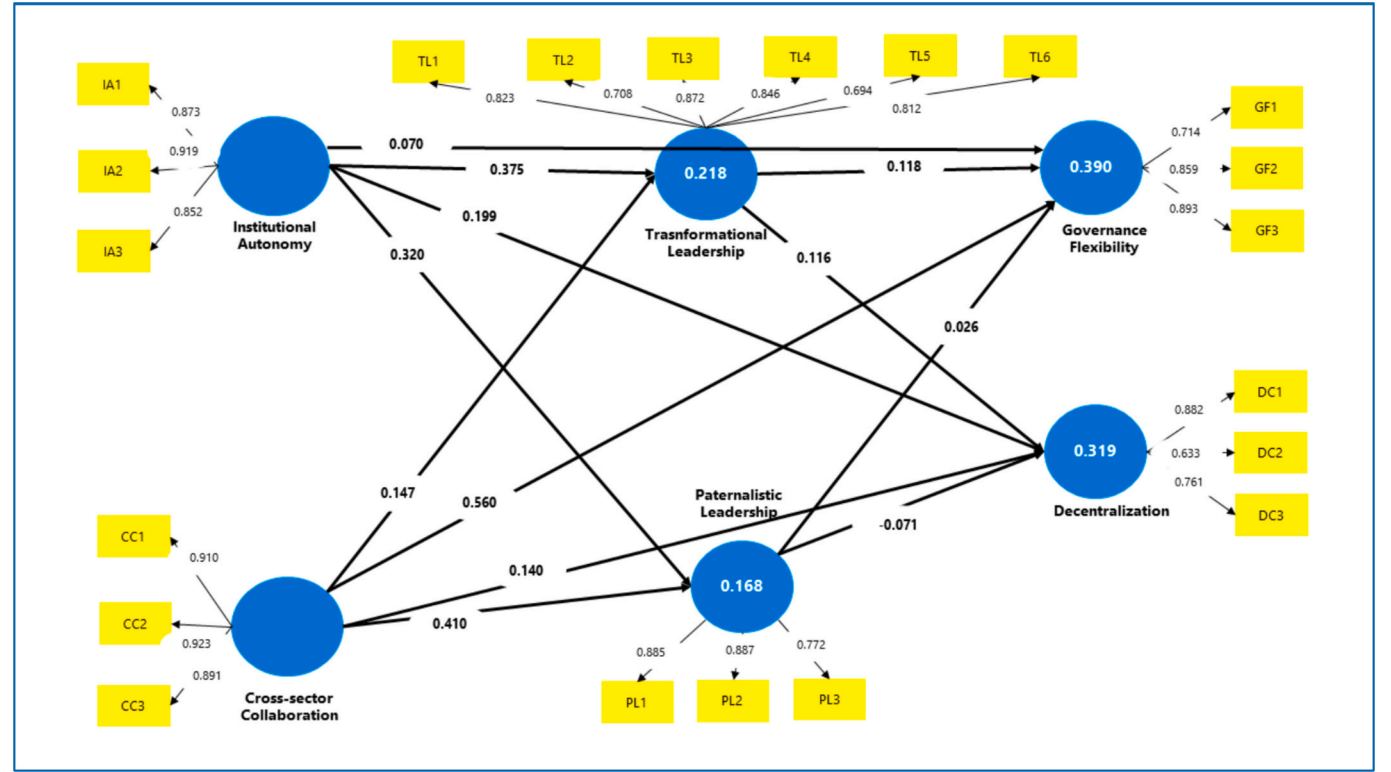** $p < .01$.
* $p < .05$.

Fig. 2. Paths coefficients and R-squared values.

Decentralization aligns with prior literature, suggesting that autonomy enhances localized decision-making and fosters decentralized governance structures (Soeparwata, 2016). In sectors such as healthcare and education, institutional autonomy allows organizations to tailor decision-making processes to sector-specific needs (Casasnovas et al., 2009). Mertkan and Sugrue (2014) further emphasize that autonomy strengthens service delivery by adapting structures to diverse community demands, reinforcing the benefits of decentralization.

However, the weaker link between Institutional Autonomy and Governance Flexibility suggests that autonomy alone does not guarantee adaptability. Wu, Gao, et al. (2024) highlight that governance flexibility is often driven by collaborative mechanisms rather than isolated decision-making autonomy. This aligns with network governance theory, which posits that horizontal collaboration and multi-sector integration facilitate more agile decision-making than standalone autonomy (Yang & Emerson, 2023).

Further, complex adaptive systems theory suggests that decentralization through autonomy lacks inherent responsiveness unless supplemented by cross-sector collaboration (Stadtler & Karakulak, 2020). Wu, Hu, et al. (2024) illustrate this in disaster response contexts, where

cross-sector coordination enhances institutional adaptability in unforeseen circumstances. These findings suggest that while Institutional Autonomy effectively enables decentralized governance, it may need to be complemented by collaborative frameworks to achieve full flexibility.

5.2. Cross-sector collaboration and governance outcomes

Findings strongly support Cross-Sector Collaboration's role in enhancing Governance Flexibility and Decentralization. Prior literature consistently emphasizes that collaboration introduces diverse perspectives, knowledge-sharing mechanisms, and resource integration, enabling institutions to respond dynamically to governance challenges (Bryson et al., 2006).

The results further substantiate that cross-sector collaboration enhances decentralized governance, aligning with studies on inter-organizational partnerships in public administration (Yang & Emerson, 2023). In higher education, institutional autonomy enables universities to design decentralized governance structures that meet stakeholder needs (Wang & Holznagel, 2021). A similar trend is evident in cross-sector collaboration, where flexibility is strengthened by

integrating varied operational norms and sector-specific goals (Shumate et al., 2018).

These results suggest that cross-sector collaboration, like institutional autonomy, supports governance decentralization by fostering regional adaptability, enhancing service responsiveness, and reinforcing multi-stakeholder governance structures (Su & Zhang, 2022). Thus, these findings reinforce that an integrative model combining autonomy and collaboration is essential for effective governance reform.

5.3. Mediating role of transformational leadership

Transformational Leadership was hypothesized to mediate the effects of Institutional Autonomy and Cross-Sector Collaboration on governance outcomes, and the findings support this relationship. Transformational leaders foster a culture of innovation, trust, and shared purpose, contributing to governance flexibility and decentralization.

The results align with Sihite et al. (2020), who argue that transformational leadership fosters institutional autonomy by empowering employees to engage in independent decision-making at various organizational levels. This empowerment strengthens decentralized governance models (Zhang et al., 2012) while ensuring autonomous decision-making is guided by a shared strategic vision (Liu, 2006).

Moreover, transformational leadership has been identified as a critical enabler of cross-sector collaboration. Yizhong et al. (2019) emphasize that transformational leaders facilitate value alignment across diverse organizational sectors, crucial for establishing trust-based collaboration in public administration. Su et al. (2019) further support this claim, highlighting that transformational leaders create a culture of shared governance by encouraging proactive problem-solving across institutions.

Although these findings confirm the mediating role of transformational leadership, it is important to acknowledge that other leadership styles—such as transactional and servant leadership—may also influence governance adaptability. Future research should explore how structured incentives (as emphasized in transactional leadership) and ethical leadership principles (as in servant leadership) may contribute to governance effectiveness (Shirley & Feitosa, 2024).

5.4. Mediating role of paternalistic leadership

Findings provide partial support for Paternalistic Leadership as a mediator. While it fosters trust and enhances governance flexibility, its hierarchical nature limits decentralization, reinforcing centralized decision-making patterns.

Prior research suggests that paternalistic leadership encourages a strong directive approach that consolidates authority, which can inadvertently reduce participatory governance structures (Thomson et al., 2009). Murphy et al. (2017) further argue that authoritarian tendencies within paternalistic leadership discourage bottom-up innovation, potentially restricting knowledge-sharing and decentralized governance reforms.

Nevertheless, the benevolent dimension of paternalistic leadership has been found to improve collaborative relationships among governance actors, fostering flexibility in multi-stakeholder settings (Zelin et al., 2022). Wang et al. (2018) further emphasize that trust-building—an essential component of paternalistic leadership—enhances communication in collaborative governance frameworks, even if hierarchical structures remain intact. Given these findings, future research should examine whether combining paternalistic leadership with more participatory leadership models—such as shared or inclusive leadership—could mitigate its centralizing tendencies and better support decentralization (Göbel & Burkert, 2023).

5.5. Limitations of the present study and suggestions for future research

While this study provides valuable insights into the relationships among institutional autonomy, cross-sector collaboration, governance system flexibility, decentralization, and leadership styles within the Chinese public sector, several limitations should be acknowledged.

First, the study relied on self-reported data, which may be susceptible to response biases, such as social desirability bias or common method variance. Although steps were taken to assure participants of confidentiality, future studies could mitigate this limitation by incorporating additional data sources, such as supervisor or peer evaluations or objective performance metrics, to validate self-reported responses. Additionally, procedural remedies such as marker variables or post-hoc statistical techniques could help control for common method bias in future studies.

Second, the cross-sectional design limits the ability to make causal inferences. While the results indicate significant associations among the study's variables, the directionality of these relationships cannot be conclusively established. Future research could employ a longitudinal design to examine how institutional autonomy, cross-sector collaboration, and leadership styles influence governance flexibility and decentralization over time (Zhao et al., 2022). Longitudinal data would provide a stronger basis for causal inferences and allow researchers to observe changes and trends within the public sector. Furthermore, experimental or quasi-experimental research designs could be used to strengthen causal claims by controlling for extraneous variables.

Another limitation pertains to the geographic and cultural specificity of the sample, which was composed solely of public employees from China. The unique political, cultural, and institutional environment in China may limit the generalizability of the findings to other countries or regions (Cano Ibarra et al., 2023). Future studies could extend this research by examining similar constructs in diverse cultural and administrative contexts, allowing for comparisons and identifying potential cultural moderators in the relationships among institutional autonomy, cross-sector collaboration, and governance flexibility (Cai & Guo, 2023). Cross-national studies could provide valuable insights into whether governance flexibility and decentralization function differently across political and administrative settings, further enhancing the theoretical implications of this research.

Additionally, even though the study tries to collect data from strategic departments in specific municipalities to ensure diversity across regions and departments, the convenient sampling method still causes certain sectors and roles to be underrepresented (Lee & Ding, 2023). For instance, the sample had higher representation in health services and public security fields, while smaller departments and specialized roles were less prevalent. Future research could use targeted sampling methods to ensure a more balanced representation of all public sector departments, including those with smaller or more specialized functions. Using stratified random sampling in future studies could help address this imbalance by ensuring a proportional representation of different public administration sectors.

Finally, this study focused on the mediating roles of transformational and paternalistic leadership styles. While these leadership styles are highly relevant in public sector governance, other styles, such as transactional or servant leadership, may also play important roles in influencing governance outcomes (Shirley & Feitosa, 2024). Future research could explore additional leadership styles and their effects on institutional autonomy, cross-sector collaboration, and governance flexibility to provide a more comprehensive understanding of leadership's role in public sector governance. Moreover, leadership contingency models should be considered to examine how different leadership styles interact with organizational culture, political structures, and institutional settings in shaping governance effectiveness.

In conclusion, while this study advances our understanding of governance flexibility and decentralization in the Chinese public sector, addressing these limitations in future research would enhance the

robustness and generalizability of the findings. Expanding the scope of research to different cultural contexts, using longitudinal data, and exploring additional leadership variables would offer deeper insights into the dynamics of governance systems and the factors that contribute to effective public administration. Additionally, integrating experimental, comparative, and multi-method approaches would provide a more comprehensive understanding of the structural and leadership dynamics that shape public sector governance.

5.6. Recommendations for leadership and governance strategies in China's public administration

Building upon the study's findings, several strategies can be recommended to enhance governance flexibility and decentralization within China's public administration. These suggestions focus on leveraging leadership styles and governance practices to create a more adaptive, collaborative, and responsive public sector capable of addressing complex, rapidly evolving challenges.

Transformational leadership emerged as a critical factor in fostering governance adaptability and decentralization by promoting a culture of innovation, trust, and shared purpose (Olugboyega et al., 2024). Public administrators in China could benefit from adopting transformational leadership practices that empower team members to make independent decisions and contribute actively to governance processes. Transformational leaders can facilitate flexibility and decentralization by fostering intellectual stimulation, encouraging individualized consideration, and aligning organizational goals (Kolga, 2023).

Moreover, transformational leadership has been linked to higher engagement and lower exhaustion among public employees, particularly when leaders act as secure bases for their teams (Navas-Jiménez et al., 2025). In this sense, transformational leadership should promote autonomy and provide psychological safety, ensuring that decentralized teams feel supported in decision-making.

While paternalistic leadership's authoritative aspects can hinder decentralization, its benevolent qualities can positively impact governance flexibility by fostering a supportive, trust-based environment (Zheng et al., 2020). To mitigate the centralizing effects of paternalistic leadership, public administrators should emphasize open dialogue and empower local teams with discretionary authority. Creating spaces for inclusive discussions can encourage innovation and adaptability, counterbalancing hierarchical tendencies (Li et al., 2021). Secure Base Leadership principles, which integrate support with structured authority, could provide an alternative leadership model that retains the benefits of paternalism while enhancing adaptability (Navas-Jiménez et al., 2025).

Governance systems can more effectively delegate authority to regional levels by implementing frameworks that facilitate collaborative decision-making and shared accountability. These collaborations allow public administrators to tailor services to specific community needs more closely and enhance adaptability in addressing multi-stakeholder challenges.

In times of crisis, adaptive leadership becomes particularly crucial, enabling public administrators to shift strategies dynamically in response to emerging governance challenges (Sott & Bender, 2025). For instance, incorporating network governance models into emergency management could improve the public sector's capacity to respond effectively to crises, where cross-organizational coordination and rapid adaptability are essential. Research on agile leadership configurations has demonstrated that leaders who integrate autonomy, risk-taking, and collaboration effectively are better positioned to navigate uncertainty and drive governance innovation (Tigre, 2024).

The findings underscore the value of cross-sector collaboration as a mechanism for promoting decentralized, locally responsive governance. Chinese public administrators could focus on building and strengthening partnerships with private and non-profit organizations, particularly in areas that benefit from diverse perspectives and resources, such as

healthcare, education, and environmental management (Dominguez & Mayrhofer, 2021). By implementing frameworks that facilitate collaborative decision-making and shared accountability, governance systems can delegate authority to regional levels more effectively. These collaborations allow public administrators to tailor services to specific community needs more closely and enhance adaptability in addressing multi-stakeholder challenges. While institutional autonomy supports decentralized governance, the study indicates that autonomy alone may not suffice for achieving full flexibility. Public administrators should complement institutional autonomy with cross-sector and network governance mechanisms to create a governance structure that balances localized decision-making with adaptability. This integration could involve collaborative networks connecting autonomous institutions with regional and local partners, fostering independence and adaptability. For instance, incorporating network governance models into emergency management could improve the public sector's capacity to respond effectively to crises, where cross-organizational coordination and rapid adaptability are essential.

Given the importance of leadership styles in shaping governance outcomes, China's public administration may benefit from targeted training programs designed to cultivate adaptive leadership skills (Ju & Zhou, 2020). In complex and rapidly changing environments, such as disaster management and public health (Grant, 2022), applying complex adaptive systems approaches can enhance the adaptability of governance systems (Latonen et al., 2023). Public administrators could integrate complex adaptive systems principles with cross-sector collaboration frameworks to create governance models capable of responding dynamically to unforeseen challenges. This approach would involve setting up flexible response teams, encouraging decentralized decision-making in crises, and fostering horizontal collaboration across autonomous agencies, all of which can enhance the resilience and effectiveness of public sector responses in uncertain contexts (Khan et al., 2024).

These strategies provide a roadmap for public administrators in China to harness leadership and governance frameworks that support adaptability, decentralization, and resilience in the face of modern governance challenges (Lee & Lee, 2022). By adopting these approaches, China's public administration can better align with society's evolving needs, ultimately creating a more responsive and citizen-centered governance system.

6. Conclusion

This study provides valuable insights into how Institutional Autonomy, Cross-Sector Collaboration, and Leadership styles—specifically Transformational and Paternalistic Leadership—contribute to governance flexibility and decentralization within China's public administration. The findings support the proposed hypotheses, demonstrating that institutional autonomy and cross-sector partnerships are critical drivers of a more adaptable and responsive governance structure. Transformational Leadership emerged as a positive mediator, linking autonomy and collaboration to flexibility and decentralization. At the same time, Paternalistic Leadership showed mixed effects, highlighting the complex role of authority and benevolence in public sector governance.

The theoretical implications of this study extend leadership research by illustrating how different leadership styles function within decentralized governance structures. While transformational leadership fosters adaptability through empowerment and vision, paternalistic leadership's hierarchical nature may limit decentralization while enhancing governance flexibility. These findings contribute to the broader leadership literature by emphasizing the need for leadership models that balance structured authority with adaptability in public administration.

The implications of this research are significant for policymakers and administrators in China's public sector. They suggest that fostering

autonomy, enhancing inter-sectoral partnerships, and adopting adaptive leadership styles can support governance systems that are both resilient and locally responsive. Additionally, the study highlights the necessity of integrating leadership styles into governance frameworks, particularly in complex bureaucratic environments where structural and relational dynamics intersect. Despite these contributions, this study has limitations, including its reliance on self-reported data and a cross-sectional design. Future research should address these constraints by employing longitudinal methods and incorporating multi-source data to validate findings. Further exploration of additional leadership styles, such as adaptive or servant leadership, could offer deeper insights into leadership's role in governance adaptability.

Overall, this study underscores the importance of tailored governance approaches that meet the unique needs of China's rapidly evolving public administration landscape.

CRediT authorship contribution statement

Lu Yin: Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Software, Methodology, Investigation, Formal analysis, Data curation, Conceptualization.

Informed consent

Before participation, respondents provided informed consent electronically, acknowledging the study's purpose, their right to withdraw, and the confidentiality of their responses.

Ethical approval

This study adhered to ethical and legal standards in social science research, fully complying with the Chinese Personal Information Protection Law (PIPL), which regulates the collection, processing, and protection of personal data in research involving Chinese citizens. Ethical approval was obtained from the Ethics Committee of Sichuan University, which reviewed the study design to ensure adherence to human research standards and data privacy regulations, with an Approval number 110902SPPM-2023, Date of approval 2023-11-22.

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Declaration of competing interest

The author has no commercial, financial, or commercial interests to declare.

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Data availability

the data collected for this study are freely available for research purposes (https://osf.io/8z9rq/?view_only=8a3d3193d70d43998ca3aa7e5f0f5e12) and added to this submission in an anonymized way for the author.

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