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Sustainable promotion of farmers' work performance: servant leadership insights from Chinese agricultural entities

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As China's agricultural sector modernizes, enhancing farmers' sustainable work performance remains pivotal. This study examines how Servant Leadership directly and indirectly improves productivity in emerging agricultural entities, with Organizational Identity serving as a critical mediator. Structural equation modeling reveals two direct pathways: Altruism ($\beta = 0.124$), where leaders prioritize farmers' well-being through equitable resource allocation and personalized support, fostering trust and reducing attrition; and Social Responsibility ($\beta = 0.198$), where ethical practices and community-driven programs align organizational goals with societal welfare, motivating environmentally conscious productivity. Indirectly, Servant Leadership strengthens performance by building farmers' Organizational Identity ($\beta = 0.613$). Three mechanisms drive this: (1) Emotional Soothing ($\beta = 0.370$), where empathetic leaders mitigate job stress through open dialog, enabling farmers to focus on collaborative tasks; (2) Persuasive Guidance ($\beta = 0.304$), which harmonizes personal and organizational objectives via participatory decision-making, boosting intrinsic motivation; and (3) Leadership Wisdom ($\beta = 0.270$), where leaders' strategic adoption of innovations equips farmers with skills to navigate market risks. By addressing farmers' developmental needs and nurturing belonging, Servant Leadership cultivates a loyal, adaptive workforce. These findings demonstrate that integrating ethical governance, emotional support, and technology-driven guidance can sustainably elevate agricultural productivity while retaining talent. The study provides actionable insights for policymakers to develop leadership frameworks that balance productivity with farmer welfare, advancing China's agrarian modernization goals. This human-centric approach underscores the role of leadership in harmonizing economic growth and social equity within transitional agricultural systems.

KEYWORDS

work performance, servant leadership, organizational identity, agricultural entities, leadership behavior

1 Introduction

In the wake of China's agricultural revolution, a paradigm shift is occurring with the emergence of novel agrarian management entities, including large agricultural households, family farms, professional farmers' cooperatives, and agricultural enterprises (Hu et al., 2022). These modern agribusiness entities, burgeoning from economic reforms and market liberalization, epitomize the synergy between traditional family management systems and contemporary market economy strategies. Characterized by expansive operational scales,

intensive business models, specialized production techniques, acute market acuity, and enhanced management caliber, these entities are not merely transforming the agricultural sector but fundamentally reshaping rural Chinese society’s external environment, internal structure, and social foundation (Gao et al., 2020; Shen et al., 2022; Zhang et al., 2016).

Within this dynamic milieu, leadership assumes paramount importance (Potluka and Fanta, 2021). Leaders in these nascent agricultural settings navigate an intricate web of challenges, from adapting to the expansive scale and specialization of modern agribusiness to grappling with market diversification and commercialization nuances (Wang et al., 2023). Effective leadership transcends task management, encompassing inspiration for innovation, fostering employee engagement, and steering businesses through tumultuous market and social environments (Mustamil and Najam, 2020; Kuonath et al., 2021). The leader-employee interaction, particularly within the complexity of modern agricultural practices, becomes a critical component in this intricate system (Martinez and Leija, 2023), with leadership styles profoundly impacting overall performance and workforce morale (Iqbal et al., 2020; Canavesi and Minelli, 2022).

This context underscores the exigency for adaptive and effective leadership styles. Approaches incongruent with the modern agricultural workforce’s needs and aspirations can precipitate diminished job satisfaction, elevated turnover rates, and consequent declines in productivity and business growth (Aboramadan, 2021; Song et al., 2022; Hutabarat et al., 2021). Servant Leadership emerges as a promising paradigm, rooted in principles prioritizing employee development, interests, and well-being. This leadership style aligns seamlessly with the inherent values of community spirit and cooperation characteristic of agricultural enterprises (Ozbezek, 2022;

Peng and Chen, 2021), demonstrating potential to revolutionize employee engagement, job satisfaction, and productivity (Shailja et al., 2023; Neubert et al., 2021; Khalil et al., 2024).

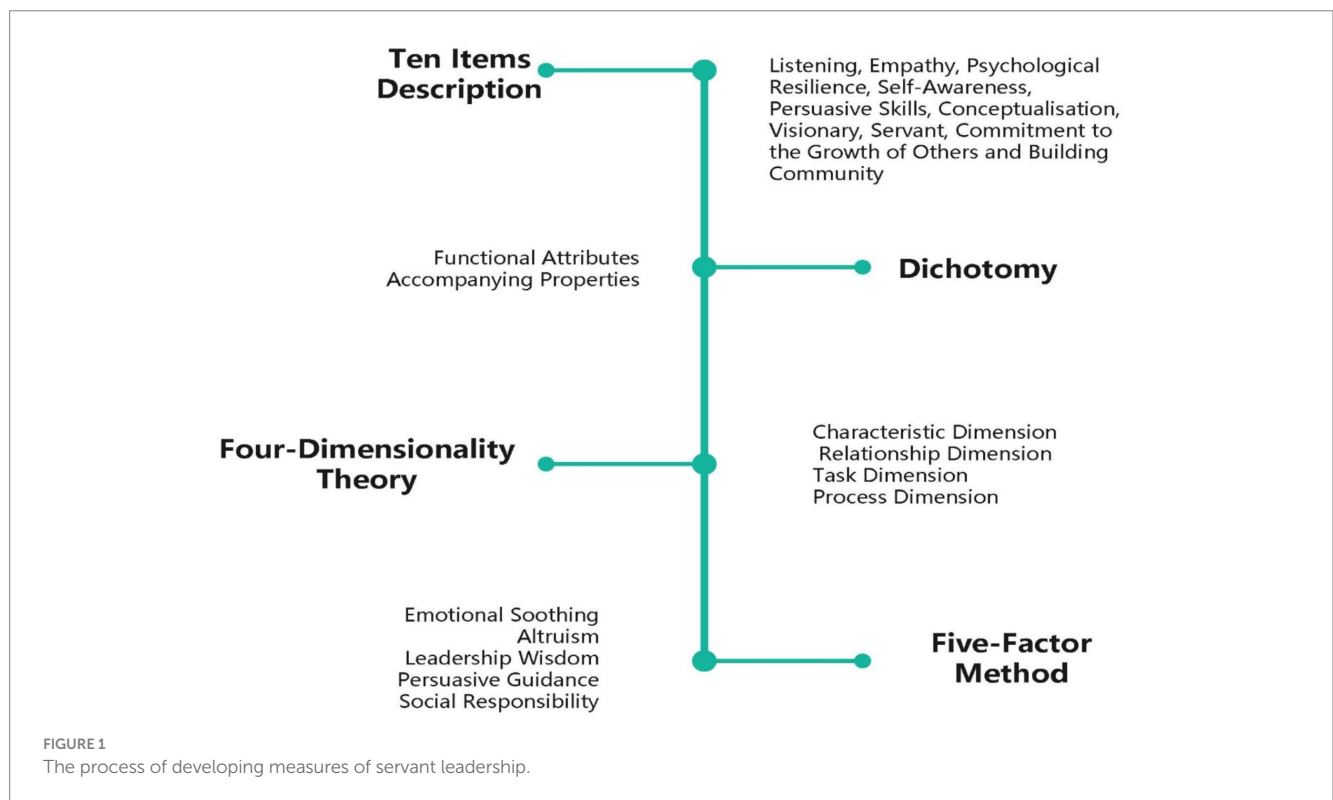
By fostering a supportive, inclusive culture conducive to professional growth and team cohesion (Iqbal et al., 2023; Li et al., 2021), servant leadership exhibits a robust correlation with enhanced employee performance (Khan et al., 2022; Yadeta et al., 2023). This approach not only amplifies employee performance but also fortifies the management-staff bond, engendering heightened employee dedication and exemplary professional conduct. With its focus on service, respect, and empowerment, servant leadership appears particularly apposite for China’s agricultural sector.

This study employs structural equation modeling to elucidate both direct and indirect effects of servant leadership on employee performance in these novel agricultural business entities. In doing so, it offers a comprehensive exploration of servant leadership as a transformative force in China’s agricultural landscape, potentially heralding a new era of productivity, employee satisfaction, and holistic growth.

2 Literature review and theoretical analysis

2.1 Servant leadership measures development

Servant leadership, as an innovative paradigm of leadership, has been conventionally measured across a variety of dimensions. Figure 1 shows the process of developing servant leadership measures. The foundational dimension, originating from the



proposal of servant leadership in the 1970s, encapsulates ten key attributes: listening, empathy, psychological resilience, self-awareness, persuasive ability, conceptualization, vision, servitude, commitment to others' growth, and community building (Spears, 2010). The idea that leadership is rooted in service, with the leader embodying servitude before leadership, underscored this measure. Subordinates' progress, increased autonomy, and propensity to assume a servant leader role served as empirical measures of servant leadership within this dimension (Gandolfi and Stone, 2018). The second measure uses a two-dimensional approach: functional and concomitant attributes. Rooted in the belief that servant leaders are primarily motivated by the service of others, prioritizing others' needs, desires, and interests above their own, this measure underscores the selfless, service-centric nature of this leadership style (Al-Asadi et al., 2019). The leadership process, as interpreted within this dimension, highlights the leader's shift of attention from self to followers, striving to meet their physiological, psychological, and emotional needs, with service at the core (Lu et al., 2019). The third measure comprises the four-dimensional theory, relational, task, and process dimensions. Here, servant leadership is construed as benevolent, people-oriented leadership behavior, with leaders, driven by morality and responsibility, prioritizing followers' interests, respecting their values, and nurturing their abilities (Chiniara and Bentein, 2018). Despite variations in the conceptual definition of servant leadership, the core principles remain consistent, emphasizing service to others and development of followers over leader's self-interests. Innovatively synthesizing these existing measurement dimensions, the present discourse proposes a five-factor categorization for servant leadership indicators: emotional comfort, persuasion and guidance, altruism, leadership wisdom, and social responsibility. This classification seeks to present a comprehensive yet nuanced understanding of servant leadership, merging traditional indicators with innovative factors to encapsulate the multidimensional complexity of this leadership paradigm.

2.2 The effect of the five-factor measure of servant leadership on work performance

In the evolving landscape of China's new agricultural management entities, the implementation of servant leadership, characterized by a five-factor measure, has demonstrated significant impact on employee work performance. This analysis explores how each factor—emotional soothing, persuasive guidance, altruism, leadership wisdom, and social responsibility—uniquely contributes to enhancing work performance within these organizations.

Emotional comfort, the first factor, involves the leader's capacity to provide empathetic support and understanding, aiding employees in managing their emotions (Obi et al., 2021). This aspect is particularly crucial in the high-pressure agricultural sector, where addressing emotional well-being can significantly boost morale and mental resilience (Zheng et al., 2024). Leaders excelling in emotional comfort create a nurturing work environment, facilitating a more engaged and content workforce (Xiao et al., 2023).

Persuasive guidance, the second factor, focuses on the leader's skill in inspiring and aligning employees with organizational goals (Yue et al., 2022). In agricultural settings, where collaboration is key, this factor ensures that individual efforts are effectively channeled toward

collective objectives (Khan et al., 2023). It involves not only directing but also actively engaging employees in the vision and decision-making process, enhancing their commitment and participation (Rabiul et al., 2023).

Altruism, the third factor, prioritizes employee needs and welfare over personal interests (He et al., 2023). In agricultural management, altruistic leadership manifests as genuine concern for employee development, satisfaction, and well-being (Azila-Gbettor, 2023). Such leaders are perceived as more trustworthy and supportive, leading to increased employee loyalty, reduced turnover, and a more motivated workforce (Xie et al., 2021).

Leadership wisdom, the fourth factor, encompasses the ability to make informed decisions, anticipate future trends, and navigate complexities (Hudson, 2020). In the dynamic agricultural sector, this wisdom is essential for adapting to changing market conditions and technological advancements, guiding teams through challenges and innovations to ensure sustainable growth and stability (Krumrei-Mancuso and Begin, 2022).

Social responsibility, the fifth factor, reflects the leader's dedication to societal well-being and ethical practices (Mallen Broch et al., 2020; Lythreathis et al., 2021). In agricultural management, this could involve implementing sustainable farming methods, ethical labor practices, and community engagement (Islam et al., 2023). Leaders demonstrating social responsibility not only improve the organization's public image but also instill a sense of purpose and ethical consciousness among employees (Velasco Vizcaino et al., 2021; Ayoko, 2022).

The integration of these five servant leadership factors directly impacts work performance in agricultural entities. Altruism and social responsibility foster immediate improvements in employee engagement and commitment (Wang et al., 2023; Lima et al., 2023), while emotional comfort, persuasive guidance, and leadership wisdom enhance job satisfaction, organizational commitment, and overall performance through organizational identification (Aryee et al., 2023; Thelen and Yue, 2021). This multifaceted approach of servant leadership thus plays a pivotal role in creating an environment conducive to improved work performance, underscoring its significance in the context of China's new agricultural management entities.

2.3 Introducing organizational identification as a research framework for the role of mediation

In the context of China's new agricultural management entities, organizational identification emerges as a pivotal construct, encapsulating employees' alignment with their company's culture, goals, and values (Chen et al., 2016; Zhao et al., 2019). This phenomenon transcends mere agreement, fostering a positive emotional bond and sustained willingness to contribute significantly to the organization (Farooq et al., 2014). As a critical attitudinal marker, organizational identification serves as a barometer for the cohesiveness and stability of agricultural teams, directly influencing job performance by deepening employees' sense of belonging, thereby augmenting job satisfaction, commitment, and consequently, enhancing performance (Farooq et al., 2017; Shen and Benson, 2016; De Roeck and Farooq, 2018). This identification bolsters morale and cultivates a harmonious workplace, integral to organizational efficiency (Smith et al., 2013; Randel et al., 2018).

Servant leadership stands out as a critical factor in cultivating this sense of organiza-tional identification, with research indicating its tangible strengthening of employees’ connection with their organization and teams (Omanwar and Agrawal, 2022; Lv et al., 2022). In the agricultural sector, servant leadership traits strongly correlate with employees’ professional identities. Attributes such as empathy, persuasive influence, and moral conviction inherent in servant leadership profoundly resonate with employees, fostering a sense of belonging and identification with the organization (Lythreatis et al., 2021). This leadership style promotes an egalitarian, collaborative work environment, contrasting with hierarchical, authority-driven models, enhancing employees’ emotional experiences and solidifying their organizational commitment and identification (Yesiltas et al., 2022).

The role of servant leadership in indirectly influencing job performance, mediated by organizational identification, is significant (Cho et al., 2021). Servant leadership behaviors, fostering trust and value alignment, reinforce organizational identification, which in turn positively impacts job performance (Farid et al., 2023; AlMazrouei, 2023). Thus, the interplay between servant leadership and or-ganizational identification forms a vital pathway in optimizing employee performance within these agricultural entities.

Our research investigated the complex dynamic relationship between servant leadership, organizational identification, and employee work performance, with the aim of establishing a comprehensive process model. As depicted in Figure 2, our proposed model comprises four interrelated components: (1) examining the direct effects of altruism and social responsibility on work engagement, (2) assessing the influence of emotional comfort, persuasive guidance, and leadership wisdom on organizational identification, (3) analyzing the repercussions of organizational identification on work engagement, and (4) exploring the mediating role of organizational identification in the nexus between servant leadership and work engage-ment. This holistic approach elucidates the multifaceted interactions among these variables, thereby illuminating strategies to fortify team cohesion and elevate overall perfor-mance in China’s new agricultural management sector.

3 Materials and methods

3.1 Data

The study employed a mixed-methods approach, combining 208 validated online questionnaires (collected from 242 initial responses) and 119 offline interviews (selected from 135 approached participants) across 12 counties and cities in Guangdong Province, China. Online respondents were recruited via stratified random sampling using agricultural cooperative membership databases to ensure proportional representation of diverse farm types, while offline participants were purposefully selected from high-productivity agricultural clusters through purposive sampling to target experienced stakeholders. Data validation criteria included a minimum completion time of 5 min and logical consistency checks. A standardized five-point Likert scale (1 = strongly disagree to 5 = strongly agree) was utilized to quantify perspectives in Table 1. This methodology balanced representativeness and context-specific insights while adhering to replicability standards.

3.2 Measurement indicators for the five factors of servant leadership

This study seeks to encapsulate the concept of servant leadership through the prism of five discernible factors, namely emotional comfort, persuasive guidance, altruism, leadership wisdom, and social responsibility. These factors are derived through a judicious integration of multiple validated scales, each providing a unique lens to appreciate and measure servant leadership. Servant Organizational Leadership Assessment (SOLA) represents a pioneering instrument for assessing servant leadership. Developed utilizing the Delphi method, it is composed of six dimensions, including valuing subordinates, promoting growth, community building, authenticity in treating people, providing leadership, and sharing leadership. Owing to its early inception, reliability, and validity, this scale has been extensively

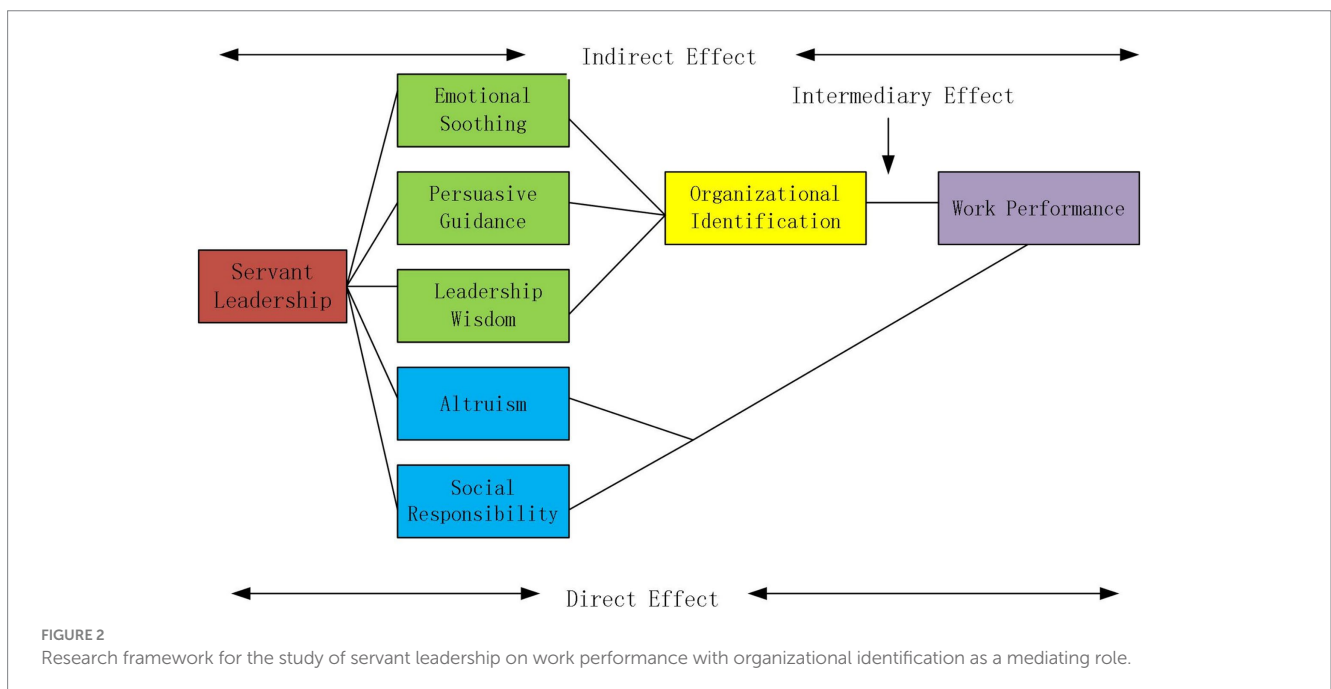


TABLE 1 Features of sample.

Features	Items	Mean	ST.DEV.
Adaptability to technological advances	Awareness and understanding of new technologies	2.791	1.215
	Willingness to learn and implement new technologies		
	Adaptability in the face of technological changes		
	Contribution to technological integration		
	Impact of technological advances on performance		
Understanding of servant leadership principles	Knowledge of servant leadership concepts	4.326	0.354
	Application of servant leadership in daily work		
	Empathy and active listening		
	Fostering a community-oriented work culture		
	Personal and professional growth		
Strong sense of organizational identity	Alignment with organizational values and goals	3.872	0.856
	Pride in organizational membership		
	Sense of belonging and inclusion		
	Commitment to organizational objectives		
	Advocacy and representation		
Collaborative and team-oriented skills	Team collaboration and interaction	3.167	0.734
	Contribution to team success		
	Conflict resolution and cooperation		
	Adaptability in team roles		
	Fostering a positive team environment		
Analytical and problem-solving abilities	Analytical thinking	3.691	0.658
	Creative problem-solving		
	Decision making under uncertainty		
	Practical application of solutions		
	Learning from experience		

applied, contributing significantly to the theoretical evolution of servant leadership. Multi-dimensional Measure of Servant Leadership (MMSL) provides a comprehensive assessment of servant leadership with an initial version comprising nine dimensions and 95 items. The dimensions encompass emotional healing, creating community value, conceptual skills, empowerment, promoting subordinates' growth, prioritizing subordinates, ethical behavior, building relationships, and service awareness. A refined version of the scale retains seven dimensions, culled down to 28 items (Winston and Fields, 2015). From this, the most strongly loading items were chosen to develop a shortened seven-item version, the MMSL-Short Version. Servant Leadership Questionnaire (SLQ) was constructed on 11 key traits of servant leadership: calling, listening, empathy, healing, awareness, persuasion, conceptualization, vision, servanthood, growth, and community building (Barbuto and Gifford, 2010). The initial SLQ offered a comprehensive understanding of these characteristics, providing a multi-faceted exploration of servant leadership. Servant Leadership Assessment Instrument (SLAI) presents a novel scale for servant leadership, adding to the array of instruments aimed at dissecting this leadership style (Dennis and Bocarnea, 2005). Servant Leadership Scale (SLS) encapsulates servant leadership through 14 items in seven dimensions: superior-subordinate rapport, empowerment, promoting subordinate development and success,

adherence to ethics, conceptualization, prioritizing subordinates' interests, and fostering community (Liden et al., 2008). Servant Leadership Instrument (SLI) with 99 items across 12 dimensions, offers an extensive view of servant leadership. The dimensions include integrity, humility, service awareness, empowerment, caring, development, vision, purpose, leadership, role modeling, team building, and decision sharing (Dennis and Winston, 2003).

3.3 Tests of reliability and validity of the five-factor indicator

The integration of these diverse scales forms the backbone of our approach, allowing us to coalesce the five aforementioned factors of servant leadership. We endeavor to present a cohesive, yet multi-faceted understanding of servant leadership, ripe for exploration and application in modern organizational settings (See Table 2). For the proposed factors of servant leadership, we conducted a reliability test and obtained satisfactory results, as detailed below. The measure for emotional soothing produced a Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy value of 0.721, indicating that the items for this construct have adequate common variance for a factor analysis. Furthermore, a Cronbach's alpha of 0.730 suggests strong internal consistency for this

TABLE 2 Measures of the five factors and the results of the reliability and validity tests.

Concept	Code	Item	KMO	Cronbach's alpha	AVE
Emotional soothing	ES1	I have a talent for helping subordinates overcome emotional problems.	0.721	0.730	0.650
	ES2	I am able to help my subordinates to turn around from bad moods.			
	ES3	I have a knack for helping subordinates to manage their emotional problems.			
Persuasive guidance	PG1	I encourage my subordinates to be hopeful about the future of the team.	0.752	0.765	0.681
	PG2	I am very persuasive.			
	PG3	I provide strong reasons to persuade subordinates to do things.			
Altruism	AL1	I fulfil the needs of my subordinates at the expense of my own.	0.599	0.603	0.556
	AL2	I put the best interests of my subordinates above my own.			
	AL3	I do my best to serve my subordinates.			
Leadership wisdom	LW1	I seem to know what's going to happen.	0.643	0.647	0.580
	LW2	I am good at predicting the range of consequences of decisions.			
	LW3	I pay attention to what is happening.			
Social responsibility	SR1	I am always ready to make the team play a more active role in community development.	0.558	0.559	0.531
	SR2	I see the potential for the team to contribute to the community.			
	SR3	I encourage my subordinates to develop a spirit of collegiality in the workplace.			

construct. An Average Variance Extracted (AVE) value of 0.650 reflects a significant amount of variance captured by the construct in relation to the amount due to measurement error, demonstrating good convergent validity. The persuasive guidance construct returned a KMO value of 0.752, again indicative of acceptable common variance for factor analysis. The Cronbach's alpha of 0.765 denotes robust internal consistency, while an AVE of 0.681 signifies strong convergent validity. The altruism construct, with a KMO value of 0.599, falls in the acceptable range for common variance, despite being at the lower end of the scale. Cronbach's alpha, at 0.603, indicates acceptable reliability, while the AVE value of 0.556 suggests adequate convergent validity. The leadership wisdom construct returned a KMO value of 0.643, signifying an adequate level of common variance. The Cronbach's alpha value of 0.647 demonstrates acceptable internal consistency, and the AVE value of 0.580 shows sufficient convergent validity. Despite the slightly lower KMO value of 0.558, the social responsibility construct maintains acceptable common variance. A Cronbach's alpha of 0.559, although at the lower end of the spectrum, still represents acceptable internal consistency. An AVE value of 0.531 indicates the adequate amount of variance explained by this construct relative to measurement error.

In sum, the aforementioned constructs—emotional soothing, persuasive guidance, altruism, leadership wisdom, and social responsibility—exhibit strong reliability metrics. The measures adhere to accepted standards of internal consistency (Cronbach's alpha > 0.50), sampling adequacy (KMO > 0.50), and convergent validity (AVE > 0.50). As such, these constructs present reliable instruments for the evaluation of servant leadership factors in our proposed model.

3.4 Setting up structural equation modeling

The study envisions using structural equation modeling to unveil the impact of servant leadership on the job performance of employees in China's new agricultural management entities (See Figure 3).

RH1: Servant leadership directly influences employee job performance.

RH1a: The altruism of servant leaders directly influences employee job performance.

RH1b: The social responsibility of servant leaders directly influences employee job performance.

Starting with Research Hypothesis 1, we posit two distinct paths from Altruism and Social Responsibility, components of Servant Leadership, to Job Performance. These direct paths encapsulate the immediate effects of servant leadership traits on job performance, suggesting that a leader's altruism and sense of social responsibility can directly enhance employee performance.

RH2: Servant leadership indirectly influences employee job performance.

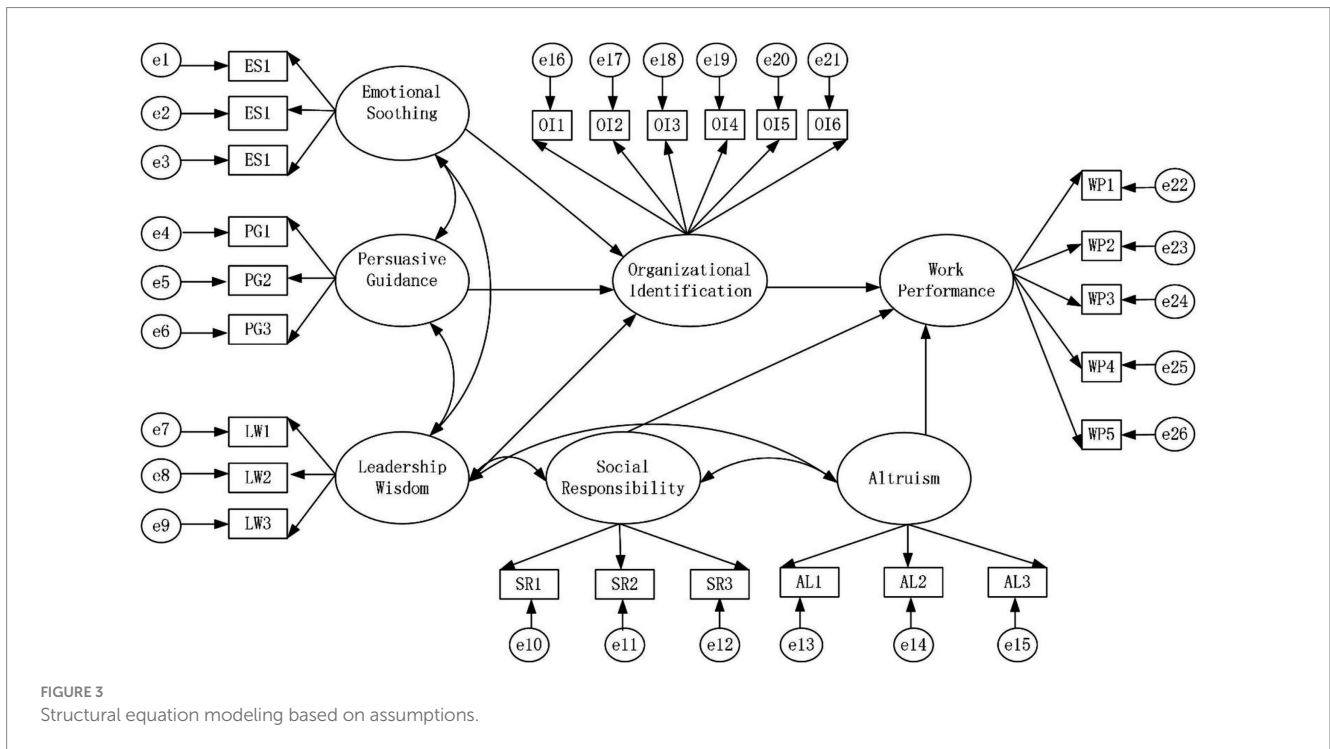
RH2a: The emotional comfort provided by servant leaders indirectly influences employee job performance.

RH2b: Persuasive guidance of servant leaders indirectly influences employee job performance.

RH2c: Leadership wisdom of servant leaders indirectly influences employee job performance.

Research Hypothesis 2 introduces a more complex, indirect route.

Here, aspects of Servant Leadership, including Emotional Comfort, Persuasive Guidance, and Leadership Wisdom, are suggested to influence Job Performance indirectly via enhanced Organizational Identification. This creates a layered pathway leading from these



servant leadership components to Organizational Identification and subsequently to Job Performance. These paths highlight the potential of these facets of servant leadership to foster a sense of belonging within the organization, thereby leading to improved job performance.

RH3: Organizational identification mediates the relationship between servant leadership and job performance.

Research Hypothesis 3 adds further complexity by proposing Organizational Identification as a mediator in the relationship between Servant Leadership and Job Performance. This suggests an additional path leading from Servant Leadership to Organizational Identification, capturing the overall effect of servant leadership on organizational belonging. Furthermore, a path from Organizational Identification to Job Performance captures the influence of this enhanced sense of belonging on job performance. This hypothesis proposes that servant leadership affects job performance not only directly but also indirectly by fostering a strong sense of organizational identity.

This layered structural equation model aims to map the multifaceted ways in which components of servant leadership influence job performance, both directly and indirectly. It suggests a dynamic interplay between leadership traits, organizational identity, and job performance, contributing to a nuanced understanding of the intricate dynamics within teams of employees in China’s new agricultural management entities.

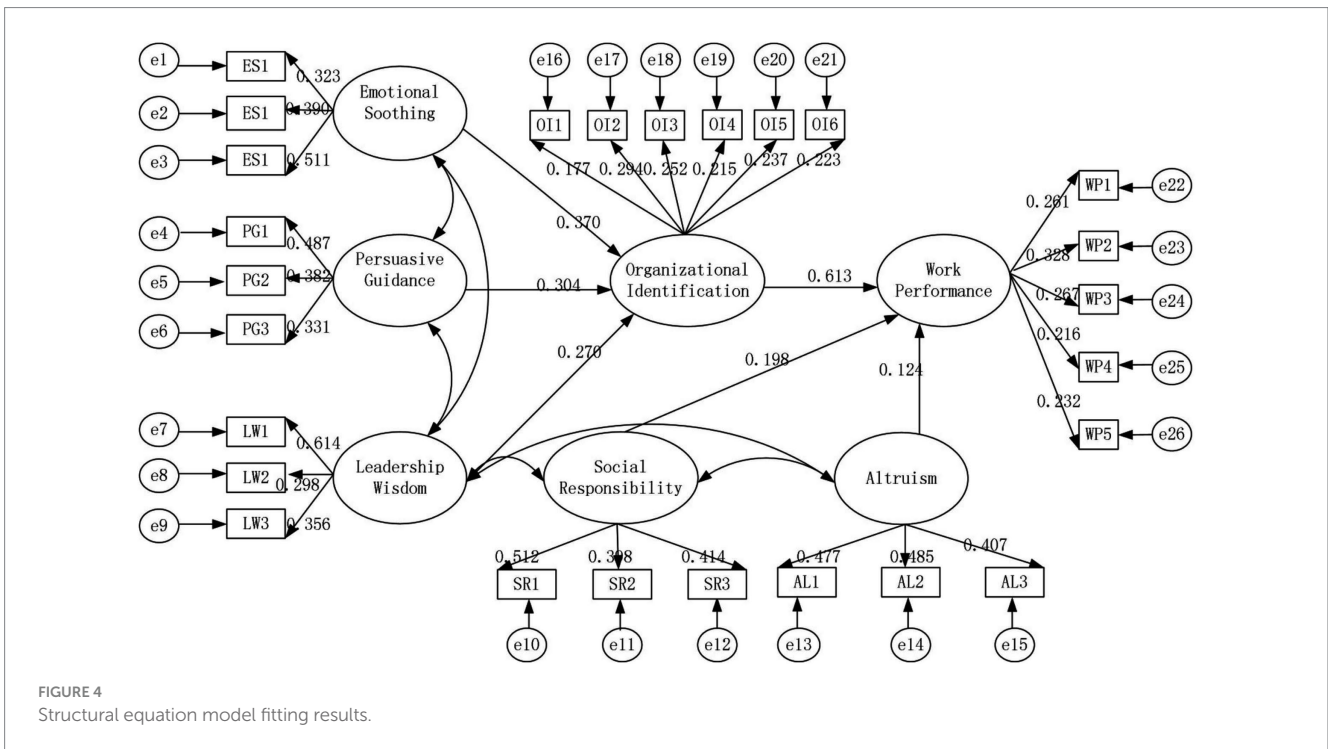
4 Results and discussion

4.1 Results of structural equation modeling

The structural equation modeling in our study elucidates three pivotal pathways by which Servant Leadership influences Work

Performance in emerging agricultural management organizations in China (See Figure 4). The initial pathway underscores the direct impact of Servant Leadership components, namely Social Responsibility ($\beta = 0.198$) and Altruism ($\beta = 0.124$), on enhancing Work Performance, underscoring the translation of these leadership qualities into discernible performance improvements among employees. The intermediary pathway delineates the nuanced mechanism wherein Servant Leadership exerts an indirect influence on Work Performance via Organizational Identity, facilitated by Emotional Comfort ($\beta = 0.370$), Persuasive Guidance ($\beta = 0.304$), and Leadership Wisdom ($\beta = 0.270$), which collectively bolster Organizational Identification, thereby augmenting Work Performance ($\beta = 0.613$). This pathway accentuates the critical role of synchronizing individual ambitions with organizational goals, nurturing a culture of loyalty and belonging. The final pathway posits Organizational Identity as a direct catalyst for Work Performance, advocating that the alignment of individual and organizational values is a fundamental driver of both work efficiency and satisfaction. In essence, our findings provide a sophisticated understanding of how Servant Leadership, Organizational Identity, and Work Performance interact within China’s nascent agricultural management sectors, highlighting the multifaceted influences that foster superior employee performance and overall organizational efficacy.

Table 3’s path coefficient analysis for employees within China’s burgeoning agricultural management sectors reveals critical insights into servant leadership’s impact on organizational dynamics. A path coefficient of 0.370 for Emotional Comfort ($p < 0.01$) underscores its pivotal role in fostering organizational identification, indicating that leaders’ proficiency in emotional stewardship significantly enhances organizational loyalty. Persuasive Guidance, with a coefficient of 0.304, showcases its substantial influence on strengthening internal bonds, affirming that effective leadership persuasion is instrumental in nurturing employee commitment. Leadership Wisdom (coefficient:



0.270, $p < 0.01$) highlights the profound effect of sagacious leadership in promoting a sense of organizational belonging. Altruism’s coefficient of 0.198 points to its transformative role in boosting work performance, suggesting that prioritizing employees’ well-being directly correlates with performance enhancements. Social Responsibility, despite a relatively modest coefficient of 0.124, is identified as playing a vital role in influencing job performance, advocating for the importance of adhering to societal and ethical standards in shaping performance outcomes. The analysis further identifies a significant path coefficient of 0.370 from Organizational Identification to Work Performance ($p < 0.01$), accentuating organizational congruence’s paramount importance in job performance enhancement.

These findings offer a refined perspective on the interrelation of servant leadership, organizational identification, and job performance within China’s new agricultural enterprises. The empirical evidence, underscored by path coefficients and statistical significances, corroborates the multifaceted influence of servant leadership on the organizational milieu. It highlights the criticality of emotional comfort, persuasive guidance, and leadership wisdom in cultivating organizational identification and, consequently, improving job performance. Moreover, the impact of altruism and social responsibility on workplace dynamics is significantly acknowledged, providing a comprehensive understanding of the complex interplay between these factors in the context of China’s evolving agricultural management sector.

4.2 Mechanisms of action on work performance

The structural equation modeling analysis of China’s nascent agricultural management firms, as detailed in Table 4, elucidates the

TABLE 3 Results of path coefficient test using Bootstrap methodology.

X → Y	Estimate	P Values	T values	Statistical results
ES → OI	0.370	***	6.677	Significant
PG → OI	0.304	***	6.298	Significant
LW → OI	0.270	***	5.383	Significant
AL → WP	0.198	***	4.605	Significant
SR → WP	0.124	***	2.919	Significant
OI → WP	0.613	***	13.857	Significant

intricate interplay among constructs through three pivotal mechanisms: direct, indirect, and mediating utility of servant leadership on employee work performance.

Direct utility analysis reveals a salient connection between servant leadership and work performance. Altruism and social responsibility, fundamental components of servant leadership, significantly impact work performance (path coefficients: 0.198 and 0.124 respectively, $p < 0.01$). Organizational Identification emerges as a critical direct enhancer of Work Performance (path coefficient: 0.370, $p < 0.01$). Emotional Comfort, Persuasive Guidance, and Leadership Wisdom directly affect Organizational Identification (path coefficients: 0.370, 0.304, and 0.270 respectively, $p < 0.01$).

Indirect utility examination shows that Servant Leadership influences employee performance through nuanced channels. Emotional Comfort, Persuasive Guidance, and Leadership Wisdom indirectly affect Work Performance via Organizational Identification.

The mediating utility analysis spotlights Organizational Identification as a pivotal intermediary. It not only directly impacts Work Performance but also serves as a conduit between Servant

Leadership and Work Performance, underscoring its mediating role. This relationship is further validated by Organizational Identification’s substantial direct impact on Work Performance.

4.3 Reliability and validity test

Reliability and validity tests were conducted to verify the robustness of the organizational identification and work performance constructs. The organizational identification construct, assessed using six items (Table 5), reflects personal connection with the team, pride in team success, and collective identity. The reliability test yielded satisfactory results, with a KMO measure of 0.778 indicating strong common variance among items and suitability for factor analysis. A Cronbach’s alpha of 0.796 demonstrated robust internal consistency, while an AVE value of 0.501, though marginally above the threshold, indicated adequate convergent validity.

The employee job performance construct in China’s new agricultural management entities was evaluated using five items (Table 6), encompassing diverse aspects of performance in this specific work environment. Reliability and validity tests yielded satisfactory outcomes, with a KMO measure of 0.815 signifying substantial common variance among items. The construct demonstrated noteworthy internal consistency (Cronbach’s alpha = 0.861) and strong convergent validity (AVE = 0.579).

Both constructs adhered to accepted thresholds for internal consistency (Cronbach’s alpha > 0.50), sampling adequacy (KMO > 0.50), and convergent validity (AVE > 0.50). The organizational identification construct presents a reliable instrument for measurement within the proposed model, while the employee job performance construct can

be considered a valid measure within the research framework for China’s new agricultural management entities. In conclusion, these rigorous reliability and validity tests underscore the robustness of the organizational identification and employee job performance constructs, enhancing the credibility of the findings within the context of this study on China’s emerging agricultural management sector.

The correlation analysis presented here serves to demonstrate the reliability and robustness of the study’s conclusions (See Table 7). By showcasing the significant positive relationships among all variables, this analysis provides a strong foundation for the reliability of the findings. The consistently strong and statistically significant correlations (all at $p < 0.001$) between the various aspects of servant leadership, organizational identification, and work performance indicate a high degree of internal consistency within the data. This consistency lends credence to the reliability of the conclusions drawn from this study. Notably, the strong correlations between Emotional Soothing (ES) and Organizational Identification (OI) ($r = 0.801$), as well as between Persuasive Guidance (PG) and Work Performance (WP) ($r = 0.816$), align with and support the study’s main findings regarding the impact of servant leadership on these outcomes. The particularly strong correlation between Organizational Identification and Work Performance ($r = 0.821$) further reinforces the reliability of conclusions regarding the relationship between these two key variables.

In conclusion, the correlation analysis results, coupled with the rigorous reliability and validity tests, provide a comprehensive quantitative foundation that substantiates the reliability of the study’s conclusions. These empirical findings offer robust support for the interrelationships proposed in the research model, underscoring the robustness of the organizational identification and

TABLE 4 Different mechanisms of influence under work performance.

	Work Performance			Organizational Identification
	Direct effect	Indirect effect	Intermediate effect	Direct effect
Servant leadership	√	√	√	√
Organizational identification	√		√	
Emotional soothing		√		√
Persuasive guidance		√		√
Leadership wisdom		√		√
Altruism	√			
Social responsibility	√			

TABLE 5 Measures of organizational identity and results of reliability and validity tests.

Concept	Code	Item	KMO	Cronbach’s alpha	AVE
Organizational identification	OI1	If a story in the media criticized my team, I would feel embarrassed.	0.778	0.796	0.501
	OI2	When others praise the team, I feel it is a compliment to me personally.			
	OI3	I am interested in what others think about the team.			
	OI4	When someone criticises the team, it feels like a personal insult to me.			
	OI5	When I talk about my organization, I usually say “we,” not “they”			
	OI6	The success of the team is my success.			

employee job performance constructs. Collectively, these analyses strengthen the overall credibility of the findings regarding servant leadership’s influence on organizational identification and work performance within the context of China’s emerging agricultural management sector. The convergence of strong correlations, satisfactory reliability metrics, and valid construct measures enhances confidence in the study’s outcomes and their applicability to the evolving landscape of agricultural management entities in China.

4.4 Hypotheses tested in this study

This study confirms the following hypotheses, providing substantive insights into servant leadership in China’s new agricultural management entities (Table 8). Research Hypothesis 1 is validated, establishing that servant leadership directly affects

employee job performance, with its inherent qualities elevating performance levels. Hypothesis 1a is supported, demonstrating altruism’s direct, positive effect on job performance, while Hypothesis 1b is confirmed, validating the impact of leaders’ commitment to social responsibility on performance outcomes. Research Hypothesis 2 and its sub-hypotheses are corroborated, confirming the indirect influences of servant leadership on job performance through organizational identification. Hypothesis 2a is supported, verifying that emotional comfort indirectly influences performance via organizational identification. Hypothesis 2b is validated, confirming persuasive guidance’s role in this process, while Hypothesis 2c is upheld, demonstrating leadership wisdom’s indirect impact, mediated through organizational identification. Research Hypothesis 3 is substantiated, culminating the theoretical exploration by confirming organizational identification as a critical mediator between servant leadership and job performance. The study validates that servant leadership’s components enhance performance primarily

TABLE 6 Measures of work performance and results of reliability and validity tests.

Concept	Code	Item	KMO	Cronbach’s alpha	AVE
Work performance	WP1	The employee manages more duties than normally assigned.	0.815	0.861	0.579
	WP2	The employee achieves work goals.			
	WP3	The employee helps others when they are overwhelmed by work.			
	WP4	The employee is always on time for work.			
	WP5	The employee acts as a calming influence when co-workers are in an argument.			

TABLE 7 Results of correlation analysis for each variable.

	ES	PG	AL	LW	SR	OI	WP
ES	1.000						
PG	0.788***	1.000					
AL	0.695***	0.692***	1.000				
LW	0.712***	0.715***	0.623***	1.000			
SR	0.684***	0.633***	0.598***	0.629***	1.000		
OI	0.801***	0.789***	0.706***	0.736***	0.687***	1.000	
WP	0.794***	0.816***	0.692***	0.738***	0.664***	0.821***	1.000

***Means $p < 0.01$.

TABLE 8 Status of testing of research hypotheses.

Hypothesis	Item	Conclusion
1	Servant leadership directly influences employee job performance.	Valid
1a	The altruism of servant leaders directly influences employee job performance.	Valid
1b	The social responsibility of servant leaders directly influences employee job performance.	Valid
2	Servant leadership indirectly influences employee job performance.	Valid
2a	The emotional comfort provided by servant leaders indirectly influences employee job performance.	Valid
2b	Persuasive guidance of servant leaders indirectly influences employee job performance.	Valid
2c	Leadership wisdom of servant leaders indirectly influences employee job performance.	Valid
3	Organizational identification mediates the relationship between serv-ant leadership and job performance.	Valid

by fostering a strong sense of organizational identification and belongingness.

These findings collectively affirm the multifaceted nature of servant leadership's impact, highlighting the interplay between leadership behaviors, organizational identification, and performance outcomes in China's new agricultural management entities. The confirmation of these hypotheses provides empirical support for a nuanced understanding of how servant leadership principles can be leveraged to enhance organizational effectiveness and employee performance in this evolving sector.

5 Conclusion

This dissertation meticulously investigates the intricate relationship between servant leadership and employee performance within China's Agricultural Management Entities. Our analysis traverses a spectrum of hypotheses, examining both direct and indirect effects of leadership on performance, contextualized within the unique operational framework of China's burgeoning agricultural sector. This comprehensive study elucidates the dynamic interplay between leadership styles and the operational realities faced by agricultural organizations.

Servant leadership, characterized by altruism and social responsibility, emerges as a pivotal force directly enhancing employee performance. This direct correlation is evidenced by the immediate, tangible impact of specific leadership behaviors on workforce productivity. Concurrently, the nuanced intricacies of organizational dynamics unveil critical indirect influence channels. Facets such as emotional support, effective communication, and insightful guidance lay the groundwork for heightened productivity and job satisfaction. This aspect is particularly vital in the diverse landscape of China's agricultural sector, encompassing a wide array of operational models from small family-run farms to expansive conglomerates.

In the post-reform era, with its heightened emphasis on market orientation, leadership must navigate market fluctuations and steer employees through market-induced transformations. The indirect influences of servant leadership nurture an organizational ethos of innovation, adaptability, and resilience. As the sector evolves toward specialized and intensive farming practices, the strategic foresight of servant leaders becomes increasingly critical, encouraging employee specialization and leveraging technological innovations for improved productivity.

The increasing focus on sustainability and ethical practices aligns with the foundational principles of servant leadership. Leaders championing operational efficiency alongside ethical stewardship echo the broader objectives of sustainable agriculture. In the face of governmental regulations and global market pressures, the adaptive nature of servant leadership ensures informed, proactive decision-making that supports employee performance.

In summation, this dissertation articulates how servant leadership, through a balanced amalgamation of direct and indirect effects, significantly elevates employee performance within China's Agricultural Management Entities. By adeptly navigating the sector's diverse operational dynamics and embracing multifaceted challenges, servant leadership fosters enhanced employee engagement, satisfaction, and productivity, contributing to the entities' enduring

success and sustainability in an increasingly complex market and societal context.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Ethics statement

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. Written informed consent from the [patients/participants OR patients/participants legal guardian/next of kin] was not required to participate in this study in accordance with the national legislation and the institutional requirements.

Author contributions

JW: Writing – original draft, Writing – review & editing. LZ: Writing – review & editing, Writing – original draft. RZ: Writing – original draft, Writing – review & editing. SZ: Writing – original draft, Writing – review & editing.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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