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Leader-Member Exchange and Job Embeddedness as Predicators of Turnover Intention: An Empirical Study of Medical Staff in Public Hospitals in Guangzhou, China

YANG Fan

Doctor of Management

Supervisors:
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Abstract

This study explores the factors influencing the Turnover Intention of medical personnel in public hospitals and seeks effective strategies to reduce talent loss in public hospitals in Guangzhou. It adopts theoretical perspectives such as Leader-Member Exchange (LMX), Job Satisfaction (JS), and Job Embeddedness (JE) to delve into how these factors affect the Turnover Intention (TI) of medical personnel. Additionally, it considers two moderating variables, Career Shocks (CS) and Perceived opportunities (PO), to analyze how they influence the strength of the relationships among Leader-Member Exchange (LMX), Job Embeddedness (JE), Job Satisfaction (JS), and Turnover Intention (TI).

The study results indicate that higher quality LMX is associated with lower TI among employees; stronger JE is correlated with lower TI, and employees with higher JS tend to have relatively lower TI. Furthermore, the study finds that JS fully mediates the relationship between LMX and TI and plays a partially mediating role between JE and TI. PO can moderate LMX, JE, and TI relationships. It was also found that Positive Career Shocks (PCS) and negative Career Shocks (NCS) can moderate LMX, JE, JS, and TI relationships.

This research broadens the theoretical understanding of TI among medical personnel in public hospitals and provides empirical evidence for hospital managers on how to reduce talent loss thus offering valuable insights for future research. These findings may help hospital managers further expand and deepen their understanding of medical staff TI, effectively stabilize the talent pool, and provide methods and strategic recommendations for the continued development of hospitals and the enhancement of service quality.

Keywords: Leader-Member Exchange; Job Embeddedness; Job Satisfaction; Turnover Intention

JEL: M54; M12

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Resumo

Este estudo tem como objetivo investigar os fatores que influenciam a intenção de saída dos profissionais de saúde dos hospitais públicos e procurar estratégias eficazes para reduzir a perda de talentos. Utilizando as perspetivas teóricas da troca social líder/membro (*LMX – Leader Member Exchange)*, satisfação no trabalho e integração do trabalho (*Job Embeddedness)*, o estudo foca-se nos hospitais públicos de Guangzhou, China, e explora a forma como esses fatores afetam a intenção de saída destes profissionais. Além disso, considera variáveis moderadoras como os choques na carreira e a perceção de oportunidades, para analisar a sua influência na relação entre as trocas sociais líder/membro, integração do trabalho, satisfação no trabalho e intenção de saída.

Os resultados do estudo mostram que quanto melhor é a qualidade da troca líder/membro, menor é a intenção de saída; quanto mais forte for a integração do trabalho, menor é a intenção de saída dos trabalhadores; e também que trabalhadores com elevada satisfação no trabalho têm uma intenção de saída relativamente baixa. O estudo evidencia ainda que a satisfação no trabalho apresenta uma mediação completa entre a troca social líder/membro e a intenção de saída, e uma mediação parcial entre a integração no trabalho e a intenção de saída. Por outro lado, a perceção de oportunidades pode moderar a relação entre a troca líder/membro, a integração do trabalho e a intenção de saída. Choques positivos e negativos na carreira podem moderar a relação entre a troca líder/membro, a integração do trabalho, a satisfação e a intenção de saída.

Este estudo não só amplia teoricamente a compreensão da intenção de saída dos profissionais de saúde dos hospitais públicos, como também fornece evidências empíricas para os gestores hospitalares sobre como reduzir a perda de talentos e oferece referências valiosas para futuras pesquisas. Os resultados podem ajudar os gestores hospitalares a expandir e aprofundar a compreensão da intenção de saída dos profissionais de saúde, estabilizar a equipa de forma mais eficaz e fornecer métodos e estratégias para o desenvolvimento contínuo e a melhoria da qualidade dos serviços nos hospitais.

Palavras-chave: Troca social Líder/Membro; Integração do Trabalho; Satisfação no Trabalho; Intenção de Rotatividade
JEL: M54; M12

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摘　要

本研究旨在探究影响公立医院医务人员离职意愿的因素，并寻求有效的策略来减少人才流失。本研究以广州市公立医院的医务人员为研究对象，采用了领导成员交换、工作满意度和工作嵌入等理论视角，深入探讨了这些因素如何影响医务人员的离职意愿。同时，本研究也考虑了职业冲击和感知机会这两个调节变量，以分析它们如何影响领导成员交换、工作嵌入、工作满意度与离职意愿关系的强弱。

研究结果表明，领导成员交换的质量越高，员工的离职意愿越低；工作嵌入感越强，员工的离职意愿越低；工作满意度高的员工离职意愿也相对较低。本研究还发现，工作满意度在领导成员交换与离职意愿之间起到了完全中介的作用，在工作嵌入与离职意愿之间起到了部分中介的作用。感知机会能够调节领导成员交换、工作嵌入与离职意愿之间的关系。积极的职业冲击和消极的职业冲击能够调节领导成员交换、工作嵌入、工作满意度与离职意愿之间的关系。

本研究不仅在理论上拓宽了对公立医院医务人员离职意愿的研究视野，而且在实践上为公立医院管理者提供了关于如何减少人才流失的实证依据，还为未来的研究提供了有益的参考。通过这些研究发现，有助于医院管理者进一步拓展和深化对医务人员离职意愿的理解，更有效地稳定人才队伍，为医院的持续发展和提升服务质量提供了方法和策略建议。

关键词：领导成员交换；工作嵌入；工作满意度；离职意愿

JEL: M54; M12

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Contents

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List of Abbreviations

LMX	Leader-Member Exchange
JE	Job embeddedness
JS	Job satisfaction
CS	Career Shocks
PCS	Positive Career Shocks
NCS	Negative Career Shocks
PO	Perceived opportunities
TI	Turnover intention
EFA	Exploratory factor analysis
CFA	Confirmatory factor analysis
KMO	Kaiser-Meyer-Olkin
χ^2	Chi-Square
DF	Degree of freedom
CMIN/DF	Chi-square-DOF ratio
RMSEA	Root mean square error of approximation
RMR	Root mean square residual
GFI	Goodness of fit index AGFI Adjust goodness of fit index
NFI	Normal fit index
CFI	Comparative fit index
IFI	Incremental fit index

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Chapter 1: Introduction

1.1 Research background

For a century, employee turnover - the voluntary termination of employee employment relationships (Hom & Griffeth, 1995) - has received extensive attention from scholars and practitioners and remains a research hotspot in many fields (Diemer, 1917; Hom & Griffeth, 1995). Employees constitute the cornerstone of organizational production and construction and drive organizational reform, innovation, and development. A stable workforce can not only improve an organization's operational efficiency but also promote its sustainable development. Therefore, any organization must prioritize and strengthen its management of employees. Although many organizations strive to enhance their management capabilities and optimize operational strategies, some still need to overcome the challenge of frequent employee turnover due to the lack of these critical Eleme imperfections in their employment systems. This high turnover not only undermines the stability of the workforce but also poses a severe threat to the long-term and steady development of the organization. Employee turnover not only incurs explicit costs to the organization, such as direct expenses related to recruitment, training, and benefits, but also results in implicit costs, including indirect impacts like lost productivity, reduced team morale, disrupted customer relationships, and lost tacit knowledge (Allen et al., 2014). These costs can significantly impact an organization's financial health and operational efficiency. Therefore, conducting in-depth research on employee turnover to uncover its root causes holds crucial practical significance for organizations.

1.1.1 Research on the turnover of healthcare professionals

The issue of healthcare professional turnover is a significant topic that involves the sustainability of the healthcare system, patient safety, and medical staff turnover. It is a significant topic of the sustainability of the healthcare system, patient safety, and the quality of medical services. For example, in 2022, the YIMI Research column of the "Medical Circle" website conducted an online survey on the human resources situation in Chinese hospitals. The results showed that 34% of doctors intended to resign shortly. Half of these doctors with resignation intentions chose private hospitals, foreign-funded hospitals, technology companies,

or self-employment as their career direction after the resignation (YIMI Research, 2022). The loss of outstanding medical talent can severely hinder the development of medical institutions.

The turnover of healthcare professionals can impose numerous impacts on medical institutions. It can lead to insufficient human resources, affect the continuity and quality of medical services, and potentially bring medical safety risks to patients. Newly recruited staff may require time to adapt to the work environment and pose potential safety risks to patient safety and medical quality. Newly hired staff may require time to adapt to the work environment, during which patients may face potential risks. Additionally, it can increase recruitment and training costs and reduce the revenue of medical institutions.

The reasons for medical staff turnover are also diverse, including poor working environment, unfair salary and benefits, limited career development opportunities, and excessive work pressure. Researching the issue of medical staff turnover can improve the sustainability of medical services, enhance patient care levels, and provide valuable information for developing more effective human resource management strategies and policies. Healthcare institutions can implement targeted measures to improve medical staff satisfaction and retention rates, thereby reducing personnel turnover. For instance, the potential solutions are optimizing the work environment, adjusting salary structures, providing career development opportunities, and reducing work pressure. Implementing these measures can lower the turnover rate and boost employee morale and loyalty.

Understanding the reasons behind the turnover rate is essential for devising strategies to reduce costs and improve the efficiency of healthcare institutions. Examining medical staff's experiences and job satisfaction within the work environment, including their perceptions of leadership, colleagues, workload, and job support, can aid in comprehending the factors contributing to the turnover rate. Policies and management practices may vary across regions, countries, or healthcare institutions, potentially influencing the retention of medical staff. Studying these policies and practices and understanding their impact on medical staff retention can facilitate the development of more effective management strategies and policy recommendations.

In addition, research on turnover issues can assist organizations in more accurately estimating the cost of turnover and developing corresponding resource management strategies to control costs. Organizations can select the most beneficial approach to implement by comparing the cost-effectiveness of different strategies. A stable workforce is crucial for maintaining the efficient operation of an organization. High turnover rates can lead to team

instability, poor communication, and disrupted processes, negatively impacting the organization's effectiveness and competitiveness.

Turnover is often closely related to organizational culture and the work environment. By studying the feedback and behavior patterns of departing employees, organizations can identify potential cultural and environmental issues within themselves and take appropriate measures for improvement. For instance, potential solutions include adjusting the organizational culture, enhancing the work atmosphere, and strengthening internal communication. Implementing these improvements can create a more positive and healthy work environment, increasing employee satisfaction and loyalty.

For governments and social organizations, turnover research can provide data support and scientific evidence for formulating labor, employment, and social welfare policies. This creates a more equitable and effective labor market environment, promoting social stability and development. Simultaneously, turnover research facilitates academic research and theoretical advancements in related fields, providing additional guidance and reference for practical applications.

On an individual level, turnover also brings a range of consequences for employees. Leaving an organization often entails emotional stress (Klotz & Bolino, 2016) and may lead to financial difficulties and other unfavorable outcomes. Individuals who depart may lose contact with former colleagues (Boswell et al., 2005) and forfeit employment benefits such as health insurance (Vardaman et al., 2008). These consequences can significantly impact an employee's personal life and career development.

Given the importance and complexity of turnover issues, academic research in this area has spanned over a century and remains a focal point of study. Continuous in-depth research efforts have been made, with many scholars focusing on employee turnover intention as a predictor of actual turnover behavior. By examining the factors influencing turnover intention, management measures can be refined to mitigate the potential losses caused by employee turnover for both organizations and individuals (Akgunduz & Eryilmaz, 2018; Choi et al., 2011; Kraut, 1975, 1975; Weng & Xi, 2010). These studies advance theoretical development and innovation and provide valuable guidance and insights for practical applications.

1.1.2 The scarcity of medical and health resources is a problem the world faces

The scarcity of healthcare resources is a global challenge, not limited to any specific region or country. With the continuous growth of the global population, the intensification of aging trends, the increasing prevalence of chronic diseases, and the increasingly complex public health safety

situation, the demand for healthcare resources is also constantly increasing. However, healthcare resources worldwide exhibit significant regional disparities and uneven distribution, leaving many countries facing varying degrees of scarcity. As early as 2016, the World Health Organization predicted a global shortage of 18 million health workers by 2030. This projection reflects a severe deficiency in healthcare human resources on a global scale. The scarcity of healthcare resources manifests not only in human resources but also in medical equipment, medications, hospital beds, and other aspects. The inadequacy of these resources directly impacts the provision and quality of healthcare services, leaving many individuals unable to receive timely and effective treatment when needed.

The African region faces particularly scarce healthcare resources globally. Despite accounting for a quarter of the global disease burden, Africa has only 3% of the world's health workers, highlighting the severe challenges in healthcare provision. This extreme imbalance in healthcare resources has led to significant lags in healthcare services in Africa, unable to meet the basic medical needs of the local population. Many African countries need help providing essential health services due to persistent shortages of health workers.

As the world's most populous country, China also faces challenges related to the scarcity of healthcare resources. Although China has made significant progress in its healthcare system over the past few decades, pressing issues still need to be addressed. The most prominent among these is the need for a more robust and uneven distribution of healthcare resources.

According to the statistical data from the seventh national census in 2021, China's population has reached 1.41 billion, accounting for approximately 18.1% of the global population. The proportion of the population aged 0~14 is approximately 17.95%, while those aged 15~59 make up about 63.35%. The proportion of those aged 60 years and above has reached 18.70%, with those aged 65 years and above accounting for approximately 13.50%. Compared to the sixth national census in 2010, the proportion of the 0~14 age group has increased by 1.35 percentage points, while the 15~59 age group has decreased by 6.79 percentage points. The 60 and above and 65 age groups have increased by 5.44 and 4.63 percentage points, respectively (National Bureau of Statistics, 2021).

However, despite this vast population, data from 2021 indicates that China's healthcare resources still need to be improved in terms of overall quantity. Although there has been an increase in the number of health technicians and hospital beds per 1,000 people, this still needs to meet the growing demand for medical care. Additionally, there is a notable imbalance in the geographical distribution of healthcare resources in China, with high-quality medical resources concentrated primarily in the eastern and central regions, while the western and remote areas

are relatively lacking. This uneven distribution results in some regions needing more time to provide timely and effective medical treatment when needed.

Furthermore, with the intensification of population aging and the optimization of fertility policies in China, the demand for high-quality healthcare services among key populations, such as the elderly and children, has become more pronounced. Older adults require more healthcare services to manage various chronic diseases and health issues, while children need more comprehensive and meticulous medical care to ensure their healthy development. However, there still needs to be more in China's healthcare system to meet these demands.

To alleviate the scarcity of healthcare resources, the Chinese government has implemented a series of measures, including strengthening the training of healthcare professionals, expanding the network of healthcare services, and improving the quality of healthcare services. However, achieving significant results with these measures will take time and effort.

Globally, nations must strengthen collaboration to jointly tackle the challenges posed by the scarcity of healthcare resources. By sharing experiences, enhancing technical exchanges, promoting the rational allocation and utilization of healthcare resources, and other measures, we can collectively advance the development of global healthcare and better meet the medical needs of the people. Additionally, reducing the turnover of healthcare professionals is a crucial pathway to alleviate the shortage of medical resources. Measures such as improving the remuneration of healthcare workers, enhancing their working conditions, and providing opportunities for career development can attract more talented individuals to dedicate themselves to the healthcare sector, delivering higher-quality and more efficient medical services to the general populace.

1.1.3 The current situation of medical staff turnover in China

In June 2021, the "Opinions on Promoting High-Quality Development of Public Hospitals" issued by the General Office of the State Council (2021) explicitly emphasized the central role of public hospitals in China's medical service system. The document stressed that public hospitals must adhere to the principle of centering on people's health, further strengthen their leading position, and aim to establish and improve a modern hospital management system. To achieve this goal, a five-year plan was outlined, focusing on transforming the development approach of public hospitals from scale expansion to quality and efficiency improvement, reforming their operational models from extensive to more refined and scientific management, and readjusting resource allocation to prioritize talent and technology over material resources. These changes aim to provide higher-quality and more efficient healthcare services to the public,

effectively prevent and mitigate significant epidemics and public health emergencies, and provide solid support for the Healthy China strategy.

In October 2022, the 20th National Congress of the Communist Party of China reiterated the urgency of advancing the Healthy China initiative, explicitly prioritizing people's health protection as a national development strategy. This reflects the country's strong commitment and emphasis on protecting people's lives and health, further highlighting the indispensable role of public hospitals in safeguarding public health security. To achieve the Healthy China goals, the congress called for deepening public hospital reforms oriented towards public welfare and strengthening the medical and health workforce to enhance overall medical service levels (The 19th Central Committee of the Communist Party of China, 2022).

In response, the National Health Commission promptly issued a series of significant policy documents, such as the "National Medical Center and Regional Medical Center Establishment Standards," to promote the expansion and balanced distribution of high-quality medical resources. These measures are expected to advance medical science and comprehensively enhance China's medical service system, better meeting the growing health needs of the people.

However, despite significant investments and efforts made by national and local governments in the healthcare sector, public hospitals still need to overcome numerous challenges. Among these, the stability of the healthcare workforce is particularly prominent. Various regions have implemented incentive policies, improved salaries and benefits, and other measures to attract and retain high-level medical talent, but the results could be more satisfactory. The loss of medical staff remains severe, affecting the everyday operations and service quality of public hospitals and hindering the sustainable development of the healthcare industry. Regions across the country have also begun investing heavily in the construction of high-level hospitals, with a crucial metric being the cultivation and introduction of top-tier medical talent. Effectively attracting, managing, and building a reasonable talent pipeline while preventing the loss of excellent talent is a long-term challenge that hospital administrators must address (Lv et al., 2020). The stability of the healthcare workforce is crucial for the high-quality development of medical institutions. Although local governments and medical institutions have implemented incentive policies and improved salaries to attract healthcare professionals, the results have been unsatisfactory, and the loss of medical staff remains severe. Multiple studies have shown high turnover intention rates among medical staff in Chinese public hospitals. For instance, a survey by Wang (2021) in seven hospitals in Urumqi revealed the loss of 2,000 medical staff in five years, with a trend towards younger, less experienced, and highly educated individuals leaving. Similarly, Chen (2021) found increasing talent turnover in ten municipal

tertiary public hospitals in Fuzhou, with those leaving often being highly educated but having lower professional titles and predominantly young. These findings underscore public hospitals' critical challenges in talent management and retention.

Additionally, a survey by Shan (2021) in five tertiary hospitals in Jinan showed that 16.8% of medical staff expressed willingness to leave. This high percentage indicates dissatisfaction and concerns about the current work environment and career prospects. Another study involving 2,700 medical staff from nine public hospitals in Zhejiang, Hunan, and Sichuan provinces revealed generally high turnover intention (Wu et al., 2021), indicating a widespread risk of talent loss that poses a significant threat to the long-term development of public hospitals.

Recent research data also reflects this trend. According to the "2022 China Hospital Human Resources Status Report" released by the Medical Circle Research Institute of Yixuejie in September 2022, among the 2,226 doctors surveyed, 34% admitted having recent intentions to leave their current positions. Precisely, 16% planned to leave within 0~2 years, while another 18% intended to seek new career opportunities within 3~5 years. These statistics profoundly reflect the current dissatisfaction among the medical community regarding their work situation and the uncertainty they feel about their future career paths.

In summary, the medical staff in Chinese public hospitals are facing severe stability issues. The high turnover intention and turnover rate not only affect public hospitals' operational efficiency and service quality but also restrict the sustainable development of the healthcare industry. Therefore, conducting in-depth research on the turnover intention of medical staff in public hospitals and exploring effective talent retention strategies and incentive mechanisms are of great significance for ensuring the stable operation of public hospitals and promoting the healthy development of the healthcare industry.

1.1.4 Public health emergencies affect the TI of medical staff

At the beginning of 2020, the COVID-19 pandemic hit like a sudden storm, rapidly spreading across the globe. As the most widespread global pandemic in nearly a century, it undoubtedly posed unprecedented challenges and tremendous pressure on the healthcare systems of various countries. In this life-and-death battle against the virus, healthcare workers, as the leading force in fighting the epidemic, not only shouldered heavy medical treatment tasks but also faced enormous psychological pressure and occupational risks. Multiple studies abroad have confirmed that the COVID-19 pandemic has profoundly impacted the psychological well-being of healthcare workers, affecting their job satisfaction and turnover intention. For example, a study by Peruvian scholars Yáñez et al. (2020) found that during the pandemic, a significant

proportion of healthcare workers experienced severe mental stress, and younger healthcare workers showed a stronger intention to leave their jobs compared to older ones. This may be related to uncertainty about career prospects, fear of the epidemic, and concerns about personal safety among younger healthcare workers. A similar conclusion was drawn from a study in the Philippines targeting frontline nurses fighting the epidemic. The study pointed out that eliminating nurses' fear of the epidemic through relevant training can improve their work efficiency and job satisfaction and reduce psychological stress, thereby reducing turnover intention (Labrague & de los Santos, 2021). This suggests that fear of the epidemic and psychological stress are important factors that contribute to the increased turnover intention of healthcare workers during public health emergencies. In addition, a comparative study from Egypt also found that nurses working in COVID-19 hospitals exhibited more significant psychological stress and a stronger intention to leave their jobs than those working in non-COVID-19 hospitals (Said & El-Shafei, 2021). This may be related to the higher risk of infection, heavier workload, and more stressful work environment nurses face in COVID-19 hospitals. It is worth noting that only a few nurses from COVID-19 hospitals explicitly indicated their intention not to leave, further highlighting the epidemic's impact on the turnover intention of healthcare workers. Domestically, some scholars have also researched the turnover intention of healthcare workers during the COVID-19 pandemic. For example, Zhang (2020) and others conducted a questionnaire survey among medical workers in two tertiary public hospitals in Beijing and Shanghai. They found that emotional exhaustion significantly positively affects turnover intention. This indicates that emotional exhaustion resulting from long-term high-intensity work is an essential factor contributing to the increased turnover intention of medical workers during major public health emergencies. Synthesizing relevant research findings at home and abroad, it can be seen that public health emergencies such as the COVID-19 pandemic have significantly impacted the turnover intention of healthcare workers. New factors arising from the epidemic, such as fear of the epidemic, mental stress, anxiety, and heavy workload, are affecting the turnover intention of healthcare workers. In the current context of the still tricky epidemic situation abroad and the normalization of epidemic prevention and control domestically, there is an urgent need to investigate and obtain more empirical evidence to reveal which new factors are affecting the turnover choice behavior of healthcare workers. This will facilitate the early adoption of targeted intervention measures to stabilize the healthcare workforce, ensure the regular operation of the healthcare system, and maintain public health and safety.

1.1.5 An overview and current development of China's medical and health system

Since China launched its internal reform and opening-up policy in December 1978, this historic turning point has propelled China's overall modernization process and brought about profound changes in the healthcare sector. According to Hu (2021), China's healthcare industry has achieved remarkable accomplishments over the past few decades, establishing an integrated healthcare service system covering urban and rural areas, consisting of diversified components such as hospitals, primary healthcare institutions, and specialized public health agencies.

In China's hospital system, public and privately-run hospitals complement each other, jointly providing medical services to the populace. Public hospitals are further divided into government-run hospitals and other public hospitals. Based on their roles and tasks in the national health network, government-run hospitals are subdivided into four levels: county-run, city-run, provincial-run, and department-run. Together with grassroots medical and health institutions below the county level, they have laid a solid foundation for China's medical and health system. Meanwhile, professional public health institutions are also divided into government-run and other types, and these institutions are similarly classified into four levels based on their service areas: county, city, province, and department. This layout demonstrates the government's meticulous attention to public health management and reflects its systematic planning approach (General Office of the State Council, 2015).

By the end of 2020, statistics showed that the total number of medical and health institutions in China had reached a staggering 1.0229 million. Among these institutions were 35,400 hospitals, 9.7 million grassroots medical and health institutions, and 144,900 professional public health institutions. Regarding human resources, the total number of health workers reached 13.47 million, with health technicians accounting for the majority at 10.67 million. Additionally, 9.1 million hospital beds nationwide provided a solid patient treatment and recovery guarantee.

As a core component of China's medical service system, public hospitals shoulder the dual responsibilities of being non-profit and serving the public interest. They are indispensable in providing essential medical services to the public and handling critical and complex cases. At the same time, public hospitals are also committed to essential missions such as cultivating medical and health talents, advancing medical research, and carrying out medical education. In addition, public hospitals actively respond to government calls and bravely undertake diversified tasks, including statutory and government-designated public health services, emergency medical rescue for sudden incidents, foreign aid, national defense health

mobilization, supporting agriculture, supporting border areas, and supporting communities. By the end of 2020, there were 11,870 public hospitals in China, constituting the core strength of China's medical service system (National Health Commission, 2021).

Within public hospitals, medical staff is an indispensable force. They are not only direct providers of medical services but also explorers of scientific research and implementers of teaching work. They are the core of medical and health resources, the fundamental driving force, and the core competitiveness of hospital development. Because of their hard work and selfless dedication, China's medical and health undertakings can achieve such brilliant achievements. By the end of 2020, the number of medical staff in public hospitals had reached 8.03 million, providing high-quality and efficient medical services to patients with professional knowledge and skills (National Health Commission, 2021).

1.2 Research problem

The cost burden imposed on organizations by employee turnover is evident, and its impact extends far beyond direct financial losses. According to Sagie et al. (2002), the cost triggered by employee turnover can surprisingly amount to 17% of a company's pre-tax income, which undoubtedly warrants serious attention from corporate management. These costs encompass direct expenditures such as recruitment, training, new employee adaptation periods, and difficult-to-quantify indirect losses like reduced team morale, disrupted workflows, and damaged customer relationships.

Employee turnover is a complex phenomenon influenced by a multitude of factors. Besides traditional elements like job satisfaction and organizational commitment, variables such as job embeddedness, Leadership-member exchange, career shocks, and perceived opportunities also play significant roles. It is crucial for organizations to deeply understand these influencing factors and take corresponding managerial measures to reduce turnover rates.

The academic community has conducted numerous theoretical and empirical studies over the past few decades to further explore the underlying motivations behind employee turnover. These studies mainly focus on how job-related factors affect employees' turnover intention and often utilize variables to analyze employees' subjective attitudes, such as JS and organizational identification. However, research by Hom and Griffeth (1995), Griffeth et al (2000), and others has revealed that although these attitudinal variables correlate with employee turnover, their explanatory power is relatively limited, accounting for only 4%~5% of the variance. Maertz

and Campion (1998) further pointed out that turnover intention can only explain 12% of voluntary turnover behavior.

This suggests that although important, traditional employee attitude variables, such as job satisfaction and organizational commitment, are insufficient to fully explain employees' turnover decisions. This implies that other critical factors must be adequately considered in research to influence employee turnover behavior.

The theory of job embeddedness has injected a new dimension of thinking into turnover research. This theory analyses how the degree of embeddedness between an individual and their job affects their intention to leave from the perspective of retention. According to research by Holtom and O'Neill (2004), job embeddedness demonstrates more substantial explanatory power in predicting turnover rates compared to traditional measures of perceived mobility (such as job satisfaction and organizational commitment) and perceived ease of mobility (such as job opportunities and job search). In short, the deeper the level of embeddedness between an employee and their job, the lower the likelihood of them choosing to leave (Crossley et al., 2007).

In the Chinese socio-cultural context, characterized by "relationship orientation" and "authority orientation," the relationship between superiors and subordinates is crucial for explaining various phenomena within organizations (Guo & Li, 2015). The Leadership Member Exchange theory plays a significant role here. According to this theory, high-quality LMX relationships can lead to positive outcomes such as high satisfaction, high performance, and reduced stress. In contrast, low-quality LMX relationships may cause employees to feel ignored, increase job stress, and decrease self-efficacy, ultimately leading to turnover intention.

In addition, career shocks and perceived opportunities, as moderating variables, influence the relationship between job satisfaction and turnover intention to some extent. When the quality of communication between employees and leaders is poor, they may feel that the current organization is not conducive to their career development, reducing their JS with the current organization and generating a desire to leave. The level of perceived opportunities will further affect the intensity of this intention. Suppose employees perceive better career development opportunities externally. In that case, they are more likely to believe that leaving is a beneficial choice for them and thus seek organizations that can provide better career growth.

1.3 Research questions

Employee turnover, especially voluntary turnover, has far-reaching negative impacts not only on organizational structures but also, more broadly, on society. Driven by the pursuit of maximizing their interests, employees who voluntarily leave their positions choose to depart from their current roles actively. This behavior poses significant challenges for organizations, including increased labor management costs, expenses related to training new employees, and various implicit costs associated with position vacancies. Especially in the healthcare field, medical staff turnover can trigger severe issues, such as the loss of critical medical expertise, decreased patient trust and even patient turnover, and obstacles to disciplinary development.

Past discussions on turnover have been mainly based on the participation-withdrawal model proposed by March and Simon (1958). This model approaches the topic from two dimensions: the ease of mobility and desirability. It primarily focuses on employees' attitudinal variables and perceptions of external job opportunities. In simpler terms, when employees are dissatisfied with their jobs, they are more inclined to seek alternatives, namely new job opportunities. However, numerous empirical studies have demonstrated that this model can only explain approximately 16% of turnover cases, indicating that many of the reasons for turnover still need to be explored.

To gain a more comprehensive understanding of the complex mechanisms behind employee turnover, this study aims to explore the issue from an employee retention perspective and introduce a new entry point: the relationship between leaders and employees. Additionally, we intend to examine the predictive effects of job embeddedness and leader-member relationships on employees' turnover intention in specific contexts related to CS and PO. We will compare these factors with traditional attitudinal variables (such as job satisfaction) to determine which factors more accurately predict turnover intention. Based on this background, the core research questions of this study focus on the following aspects:

(1) How does the LMX relationship among medical staff affect their TI? We aim to explore whether high-quality LMX relationships can reduce the TI of medical staff.

(2) How does the JE of medical staff influence their TI? We hypothesize that the more profound the JE of medical staff, the lower their TI will be.

(3) How does JS among medical staff affect their TI? This is a question that has received considerable attention for a long time. We conducted empirical research at two different time points to gain a deeper understanding of the relationship between the two.

(4) Does JS mediate the relationship between LMX and TI? This is also a worthwhile question to explore, as JS is often seen as a direct outcome of the LMX relationship.

(5) Does JS mediate the relationship between JE and TI?

(6) Does CS moderate the relationship between JS and TI? When facing CS, will employees' perceptions and reactions to these factors strengthen or weaken the association between other factors and TI?

(7) Does PO moderate the relationship between JS and TI? When external opportunities increase, employees may be more inclined to leave. Will this variable intensify or attenuate the connection between other factors and TI?

Through in-depth research on these questions, we aspire to provide more effective employee turnover management strategies for businesses and organizations, especially in the healthcare sector. We aim to offer empirical support and theoretical guidance for reducing medical staff turnover rates and enhancing disciplinary development.

1.4 Research purpose

This study explores the intricate relationships between LMX, JE, JS, and TI, focusing specifically on medical professionals in public hospitals in Guangzhou, China. By constructing a research model, we seek to analyze how these variables interact and ultimately impact the turnover intention of medical staff. The following are the primary objectives of our research:

1. We will comprehensively examine the personal attributes of medical professionals in Guangzhou public hospitals, including gender, age, marital status, number of children, education level, work experience, monthly household income per capita, employment type, professional title, and years of service in the current hospital. We aim to explore whether these factors significantly influence LMX, JE, JS, and TI. Through this analysis, we hope to understand the motivations and patterns behind medical staff turnover.

2. In China's unique economic and cultural context, this study will conduct cross-cultural validations of the LMX theory and the JE theory. Considering the specificities of Chinese society and the professions of medical staff, such validations will enrich and refine existing theoretical frameworks, providing strong support for the localization of empirical research on LMX and JE theories.

3. We aim to verify whether the impacts of LMX and JE on TI significantly outweigh those of JS. This research endeavor seeks to deepen the theoretical understanding of turnover issues,

offering new perspectives and approaches for predicting and intervening in the turnover behavior of medical staff.

4. Through in-depth research on the TI of medical professionals in public hospitals, we aspire to uncover the underlying mechanisms behind voluntary turnover and identify the key factors influencing TI among medical staff in Guangzhou public hospitals. This will enrich the research content of hospital human resource management, providing targeted incentive measures for hospital administrators to reduce the turnover rate of medical staff and ultimately lowering the costs of hospital human resource management. Additionally, the findings of this study will serve as valuable empirical evidence for government health administrative departments in formulating policies for the development of public hospitals, promoting their sustainable growth, and enhancing the quality of healthcare services.

1.5 Thesis structure

This study will strictly adhere to scientific research methodologies and progress systematically. Firstly, we will clearly define the research subjects as medical staff in public hospitals in Guangzhou and provide a concise overview of the core research topics, content, methodologies, and the overall research framework. Building on this foundation, we will conduct an extensive literature review, focusing on critical theories such as LMX, JE, JS, and TI. We will systematically analyze previous studies' findings and methodologies to reveal existing research gaps and establish our study's innovative points and focal areas. Through the literature review, we will construct a solid theoretical foundation and framework and propose a targeted research framework, hypotheses, and theoretical models based on the actual situation of medical staff in public hospitals. To ensure the scientific rigor and accuracy of the study, we will use empirically validated, authoritative scales in China for pre-testing and form the final survey questionnaire after analysis. Subsequently, we will collect data widely through online surveys, targeting medical staff in public hospitals in Guangzhou. The collected data will be analyzed using SPSS 26 statistical software to test the research hypotheses.

The chapters of the study will be organized as follows:

Chapter 1: Introduction. This chapter will elaborate on the significance of research on turnover intention, particularly in the context of the current state of healthcare resources in China. It will emphasize the urgency and practical importance of studying turnover intention among medical staff in public hospitals in Guangzhou. The chapter will also present the

research background, challenges, purposes, core research questions, and the overall research structure.

Chapter 2: Literature Review and Theoretical Foundation. This chapter will comprehensively review the theories and research status related to LMX, JE, JS, CS, PO, and TI. It will explore these six concepts' connotations, structural dimensions, and measurement methods. Additionally, it will systematically examine the relationships between LMX, JE, JS, and TI, laying a solid theoretical foundation for subsequent research. Based on this, the chapter will reveal the gaps in the existing literature on turnover intention among medical staff in public hospitals and propose research hypotheses, along with a structural diagram of the relationships between variables.

Chapter 3: Research Methods. This chapter will clearly define the research subjects and basic concepts and provide detailed information on the selection and design process of variable scales. It will also explain the specific methods and procedures for data acquisition, including designing, distributing, and recovering survey questionnaires. Finally, validity tests will be conducted on the empirical data to ensure reliability and accuracy.

Chapter 4: Leader-Member Exchange, Job Embeddedness, and Turnover Intentions: The Mediating Role of Job Satisfaction. Firstly, based on the theories of LMX and JE, this chapter proposes hypotheses about the relationships among LMX, JE, JS, and TI. It hypothesizes that JS mediates the relationship between LMX, JE, and TI. Secondly, statistical software such as SPSS and PROCESS are utilized to analyze the data and test the hypotheses. Finally, the chapter concludes and discusses the findings of this study.

Chapter 5: Leader-Member Exchange, Job Embeddedness, Job Satisfaction, and Turnover Intentions: The Moderating Roles of Perceived Opportunities and Career Shock. Based on the theories of LMX and JE, this chapter proposes hypotheses about the moderating roles of CS and PO. Statistical software such as SPSS and PROCESS is employed to analyze the data and test the hypotheses. Finally, the chapter summarizes and discusses the conclusions of this study.

Chapter 6: Conclusion. Based on an in-depth discussion of the data analysis results from the previous chapter, this chapter will explore the mechanisms by which essential characteristics of medical staff influence variables such as TI. It will also discuss the underlying reasons for forming influence paths among variables, drawing on previous research. The chapter will present the study's main conclusions, summarizing the research findings and highlighting their theoretical and practical significance. It will also provide targeted policy recommendations and management implications at the government macro, industry meso, hospital micro, and individual medical staff levels. Additionally, the chapter will acknowledge

the study's limitations and shortcomings and suggest future research directions, serving as a reference for subsequent related studies.

Chapter 2: Literature Review

This chapter provides a comprehensive and in-depth literature review in critical areas such as TI, LMX, JE, JS, CS, and PO. We delve into the connotations of these concepts, elaborating on how they are defined, understood, and measured. Through a detailed analysis of these concepts, we enhance our understanding of their respective independent meanings and reveal their interconnections and influence mechanisms.

2.1 Turnover intention (TI)

Turnover is an individual choice and a process shaped within a social context. When the interaction between an individual and an organization fails to meet expected ideal states, the individual often decides to leave based on past experiences within the organization (Porter & Steers, 1973). Turnover intention, as an essential precursor to turnover behavior, has been widely recognized as one of the critical indicators for predicting actual turnover behavior. Therefore, for organizations, paying close attention to employees' turnover intention is indispensable for optimizing human resource management strategies.

2.1.1 Definition of turnover

Since the 20th century, numerous scholars have conducted research on the issue of turnover behavior (Barrick & Zimmerman, 2005; Bolt et al., 2022; Crossley et al., 2007; Griffeth et al., 2000; Holtom et al., 2005; T. W. Lee et al., 1996; T. W. Lee & Mitchell, 1994; Mobley, 1977; Mobley et al., 1978, 1979; Mobley, 1982; Muchinsky & Morrow, 1980; Porter & Steers, 1973, 1973; Price, 1977; Swider et al., 2011). Some scholars interpret the concept of turnover from a narrow perspective. For example, Mobley (1982) suggests that turnover essentially refers to the process where individuals who derive material benefits from the organization decide to terminate their membership. Such a definition excludes situations like employee entry, promotion, demotion, and lateral job transfers from the scope of turnover. It also needs to consider organizational members, such as volunteers, who may not seek material rewards. Similarly, from a narrow viewpoint, Muchinsky and Morrow (1980) contend that turnover is the voluntary decision of an individual to end the employment relationship with the

organization. However, some scholars adopt a broader approach. Price (1977) argues that turnover should be understood as any change experienced by an individual in their organizational membership. Under this definition, various employee movements, including entry, promotion, demotion, lateral transfers, and exit, are encompassed within the turnover concept. Turnover is also seen as a gradual and dynamic process.

Employee turnover is a "double-edged sword." On the positive side, it can bring fresh energy and innovation to the organization. When employees leave, the company must hire new talent to fill the vacancies, introducing new blood and ideas. New employees may bring new skills, knowledge, and experience, thus promoting innovation and development within the company. Turnover can also serve as an opportunity for personal career development, allowing employees to seek better job opportunities, higher salaries, or broader career paths. This can be beneficial for their personal growth and advancement.

On the negative side, employee turnover can impose significant human and financial costs on the company. Recruiting and training new employees requires time and resources, as well as adapting them to the new work environment and demands. This increase in staffing and training costs (Mirvis & Lawler, 1977) is accompanied by administrative expenses (Dalton & Todor, 1982). Furthermore, departing employees may take critical business secrets and client resources with them, posing potential competitive risks and operational disruptions to the organization (Staw, 1980). Frequent turnover can also negatively impact team stability and cohesion, affecting morale and productivity. The organization bears the financial burden of replacing personnel, including recruitment and training costs, as well as efficiency and productivity losses due to changes in skill sets and intellectual capital. Additionally, newcomers require time to assimilate the organization's values and culture (Sanders, 2015), further adding to operational pressures. More seriously, high turnover rates may trigger an exodus of other employees, posing a significant threat to the organization's long-term stability and success.

Based on the decision-making entity involved in the turnover process, Turnover is generally classified into two types: Voluntary Turnover and Involuntary Turnover (Maertz & Gampion, 1998). Voluntary Turnover is when an employee, driven by personal considerations or motivations, submits a resignation application to the organization. The employee ultimately leaves their position after negotiation and reaching a consensus with the organization. Such decisions are usually based on various reasons, such as seeking personal development opportunities, attending to family matters, pursuing superior working conditions, dissatisfaction with the current work environment, and expectations regarding salary and benefits. Voluntary turnover is a means for employees to exercise their rights and is a typical phenomenon of talent

mobility in the labor market. While it may result in some human and financial losses for enterprises, it can also be viewed as an opportunity for employees' personal career development. Simultaneously, it allows enterprises to optimize their human resource allocation and improve organizational efficiency. Voluntary Turnover encompasses resignation and retirement. During this process, employees must follow company policies and procedures when submitting their resignation and assist in the handover process to ensure a smooth transition and the integrity of the work handover. Meanwhile, the company should respect the employee's wish to leave and provide necessary assistance and support in completing resignation procedures, maintaining a positive corporate image, and harmonious employee relations.

On the other hand, Involuntary Turnover occurs when employees are forced to leave their current positions due to organizational factors or other objective reasons beyond their personal choice. Simply put, it involves employees leaving their positions based on decisions made by the organization or external factors rather than their own volition. This situation encompasses two types: dismissal and layoffs. Dismissal typically occurs when an employee's serious misconduct or unimprovable performance makes termination the only viable solution. Layoffs, on the other hand, arise when organizations face financial pressures and need to reduce their workforce to maintain operations, such as losing significant contracts, leading to revenue decline and forcing the organization to improve efficiency through layoffs. Involuntary Turnover can impose significant human and financial costs on enterprises and potentially affect their stability and employee morale. Therefore, when making decisions related to involuntary Turnover, enterprises need to exercise caution and take reasonable measures to minimize negative impacts. For employees, involuntary Turnover may bring economic and psychological stress. Hence, enterprises must be attentive to the legitimate concerns of departing employees and provide necessary assistance and support whenever possible, maintaining a positive corporate image and harmonious employee relations.

Since high-performing employees are more likely to initiate voluntary Turnover, their departure can significantly damage the organization's performance and core competitiveness (O’Brien-Pallas et al., 2006). In China, voluntary Turnover is the predominant type among medical staff (M. M. Major, 2013; Zhai, 2015), accounting for up to 88.5% of total Turnover (Shi et al., 2016). Therefore, it is crucial to pay more attention to the voluntary turnover of medical staff.

2.1.2 Definition of TI

Turnover intention, a key concept in organizational behavior and human resource management, refers to an employee's thoughts or tendencies to leave their current job or organization within a specific period. It is considered the final step before the actual turnover behavior, following an employee's dissatisfaction with their job (Mobley, 1977). This concept has garnered significant attention from scholars since the 20th century and has been continuously refined through in-depth research.

Regarding the conceptual definition of TI, Porter and Steers (1973) viewed it as an employee's tendency towards withdrawal behavior after experiencing job dissatisfaction. On the other hand, Mobley et al. (1978) described it as a comprehensive manifestation of job dissatisfaction, the emergence of turnover thoughts, the search for other job opportunities, and the possibility of successfully finding alternative employment.

Turnover intention reflects the potential likelihood of an employee changing jobs within a specific time. This is a subjective judgment based on an employee's feelings, which can be quantified and analyzed through observing and assessing their related attitudes or behavioral tendencies.

The formation of TI is a complex process influenced by various internal and external factors (Santos et al., 2023). Internally, key elements include JS, organizational loyalty, and career development opportunities. Suppose employees are dissatisfied with their job content, environment, or organizational culture or skeptical about the career development path provided by the organization, believing that their goals must align with the organization's direction. In that case, they may develop thoughts of leaving. External factors are also significant. The activity level of the labor market, the abundance of job opportunities, and various external temptations, such as competitors' generous benefits and poaching behaviors, can all act as catalysts for employees' TI. Employees who perceive that the external market can provide more and better opportunities are more likely to lean towards leaving their current positions.

Many scholars generally agree that TI and actual turnover behavior have a direct and close correlation. A significant positive relationship exists between the two, with the TI being viewed as the most direct precursor to an impending departure and, consequently, considered the most accurate indicator for predicting turnover behavior (Ajzen, 2002; Michaels & Spector, 1982; Mobley et al., 1979; Newman, 1974; Porter & Steers, 1973; Price & Mueller, 1981; Steel & Ovalle, 1984; Tett & Meyer, 1993; Van Breukelen et al., 2004). As an employee's TI increases, so does the likelihood of them taking concrete action to leave the organization. Therefore,

organizations aiming to reduce turnover rates and ensure stable development must gain timely insight into employees' TI and take effective intervention and management measures.

Although TI is considered an essential precursor to actual turnover behavior, we must recognize that it does not equate to turnover behavior. In practical work situations, many employees may have thoughts of leaving but ultimately do not take any real action. This could be due to various reasons, such as not finding a more desirable job opportunity, having a deep sense of loyalty towards the organization, or needing to be more apprehensive about the potential costs of leaving. Therefore, it is not enough to merely understand employees' TI; it is insufficient for organizations. It is more important to delve deeper into these intentions' underlying reasons and motivations. Only then can organizations develop genuinely effective and targeted intervention strategies.

In addition, research on TI also has certain limitations. Firstly, TI is a subjective psychological state that is challenging to observe and measure. Current research primarily relies on employee self-reporting to obtain TI data. This method may be influenced by subjective factors such as social desirability and self-perception biases. Secondly, TI is influenced by various factors that may have complex interactions. Current research still needs to reveal the intrinsic relationships and mechanisms comprehensively and accurately among these factors.

2.1.3 Factors influencing TI

These antecedent factors of TI are multi-level and multi-dimensional, interacting with each other to jointly influence an employee's decision-making process regarding turnover. Based on the mobility perspective of March and Simon (1958), an employee's decision to leave or stay is often based on two core considerations: ease of mobility and desirability. In other words, when considering turnover, employees evaluate their satisfaction with the current work environment and the attractiveness of external job opportunities. This evaluation is often directly related to the employee's TI, serving as a precursor to actual turnover behavior (T. R. Mitchell, Holtom, Lee, et al., 2001).

To gain a deeper understanding of these influencing factors, Muchinsky and Morrow (1980) provided a comprehensive framework that categorizes the determinants of turnover into three broad categories: individual, work-related, and economic opportunity factors.

Individual factors refer to variables closely related to an employee's characteristics. These factors broadly define an employee's work attitude, values, and behavior patterns. For example, age is often negatively correlated with turnover rates, meaning younger employees are more likely to change jobs frequently. In comparison, older employees prefer stability (although some

studies have challenged this view). Length of service is also essential, as employees who have served the same organization for a long time often have a more profound sense of organizational identity and loyalty. Family size, career interests, intelligence, abilities, personality, and resume are critical factors affecting TI. For instance, employees with solid career interests are more likely to seek jobs that satisfy their interests in their field. At the same time, those with high intelligence and abilities may find it easier to secure new job opportunities.

Work-related factors focus more on the interaction between the employee and the organization. These factors encompass various aspects of the work environment, ranging from direct supervisory oversight to job content diversity. For example, employees who feel that their work is recognized and provide feedback are more likely to be satisfied with their jobs, reducing their TI. Similarly, jobs that offer a high degree of autonomy and responsibility often foster employee satisfaction and commitment. Organizational-level factors such as compensation, seniority rules, and role clarity significantly impact employee TI. For instance, unfair compensation systems or ambiguous role definitions can lead to employee dissatisfaction and turnover.

Economic determinants influence employees' turnover decisions from a macro perspective. The labor market situation is a crucial factor. When job opportunities are abundant in the market, employees are more likely to leave their current positions in search of better ones. Additionally, the geographical location of industries and organizations can affect employees' turnover intention. For example, organizations in economically active areas often face higher employee turnover rates because it is easier for employees to find new job opportunities in these regions.

2.1.4 Measurement of TI

TI is a critical indicator for predicting actual turnover behavior among employees, and its accurate measurement holds significant importance for human resource management within organizations. However, measuring TI is a complex and multidimensional process. Different measurement tools have their focal points when assessing TI, but they all strive for more accurate prediction and interpretation of employee turnover behavior. By utilizing measurement tools that align with specific cultural backgrounds and research needs, researchers can delve deeper into the formation mechanism and influencing factors of TI, thereby providing organizations with more targeted management strategies.

Researchers have developed various measurement scales to understand employees' turnover intention comprehensively and accurately. One such tool is the Turnover Intention

scale developed by Mobley et al. (1978), which has become a classic in turnover research. This scale assesses employees' turnover intention through three dimensions:

1. their thoughts about quitting
2. the probability of finding an acceptable alternative job
3. their intention to search for and quit their current job

This measurement approach not only focuses on whether employees have thoughts about leaving but also explores their perception of external job opportunities and their readiness to seek new employment. This careful consideration allows the TI scale to predict employee turnover behavior more accurately.

Recognizing the influence of cultural background on turnover intention, Chinese scholars Weng and Xi (2010) adapted the TI scale proposed by Mobley et al. (1979) to fit the local context. While preserving the core concept of the original scale, they made appropriate modifications to the scale items based on China's unique sociocultural background. They applied the adapted scale to empirical research. The results showed that the adapted version exhibited good internal consistency reliability, with a Cronbach's α coefficient of 0.755, demonstrating its validity and reliability in the Chinese cultural context.

Michaels and Spector (1982) also constructed a TI scale containing six items. Their scale encompassed three critical indicators of turnover:

1. the likelihood of leaving the current job
2. the motivation to search for another job
3. the possibility of obtaining a new job

These three indicators closely align with the concepts measured by the scale developed by Mobley et al. (1978), further validating the multidimensional nature of TI measurement. Researchers can understand the formation process and influencing factors of employees' TI through this multidimensional approach.

In addition to the scales above, the TI scale developed by Liang (1999) has also been widely used in China. Li et al. (2006) conducted a large-scale survey of 1,100 employees from 20 enterprises based on this scale. The results confirmed that the Cronbach's α coefficient of the scale was 0.82, indicating good internal consistency. This suggests that Liang's scale is reliable and valid in measuring TI among Chinese employees.

2.1.5 Major turnover models

Turnover models are critical theoretical tools in organizational behavior and human resource management to explain and predict employee turnover behavior. These models integrate

internal and external factors influencing employee turnover decisions, such as job satisfaction, organizational commitment, career development prospects, and labor market conditions. By constructing the interactions among these factors, turnover models provide insights into the decision-making pathways leading to employee turnover. These models allow organizations to identify potential turnover risks and lay a solid foundation for developing effective employee retention and human resource management strategies.

2.1.5.1 The participation-withdrawal model

The participation-withdrawal model, proposed by March and Simon in 1958, aims to describe and explain the dynamics of employee attitudes and behaviors in the workplace. This model goes beyond simple predictions of employee turnover and delves into the nuanced relationship between employees and organizations. Its central question is: under what circumstances will employees choose to engage more actively in their work, and under what circumstances will they choose to withdraw, i.e., leave the organization.

The model is built upon two core concepts: ease of movement and desirability of movement. Ease of movement refers to employees' perceived difficulty in leaving their current jobs, often related to their knowledge of external job markets, transferability of skills, and ability to find new employment. On the other hand, the desirability of movement focuses more on employees' satisfaction with their current jobs, encompassing various aspects such as job content, work environment, and compensation. In simpler terms, ease of movement concerns "Can I leave," while desirability of movement concerns "Do I want to leave."

Over time, scholars have further elaborated on these two concepts. Jackofsky and Peters (1983) pointed out in their study that the desirability of movement is mainly equivalent to employee JS. In other words, when employees are satisfied with their jobs, they are more likely to view staying with the current organization as a desirable choice. Conversely, when employees are dissatisfied, they are more likely to consider leaving as a better option. Ease of movement, meanwhile, is related to employees' perceived number and attractiveness of external job opportunities. Employees ' perceived ease of movement increases when the external market offers numerous and appealing job opportunities.

Perceived ease of movement is equivalent to the perceived number of job alternatives or options available, and satisfaction and alternatives form the conceptual foundation of much of the literature on employee turnover (Hulin et al., 1985). Factors determining employees' perceived reasonableness of movement include their job satisfaction assessment and estimation of the likelihood of moving between different organizations. Elements that influence

employees' perceived ease of movement encompass the number of organizations within their visibility, access to competent job opportunities, and acceptance of those positions.

Within the participation-withdrawal model, "participation" and "withdrawal" are opposing concepts. "Participation" refers to employees' active engagement and involvement in their work, including enthusiasm for the job, a sense of responsibility, and loyalty to the organization. Highly engaged employees create more value for the organization and are more likely to receive recognition and rewards. Conversely, "withdrawal" pertains to employees' decision to leave the organization, which may stem from job dissatisfaction, disappointment with the organization, or other personal reasons.

It is worth noting that employees typically go through a series of psychological processes before making a withdrawal decision. They may reevaluate their job satisfaction, consider the possibilities of external job opportunities, and weigh the pros and cons of leaving. This process can be influenced by various factors, including personal ones (career goals and family situation) and organizational ones (work atmosphere and promotion opportunities).

March and Simon's participation-withdrawal model has provided an essential theoretical foundation for subsequent research on employee turnover. It emphasizes the significant impact of employees' psychological states on their behavior at work, reminding managers to pay attention to employees' job engagement and turnover intention and take corresponding measures to stimulate employees' motivation and retain talent. At the same time, the model also points out the complexity and multifaceted nature of employee turnover decisions, which require comprehensive consideration of various factors for research and response.

However, as Xie and Wang (1999) noted in 1999, despite its significant theoretical value, the participation-withdrawal model still has certain limitations in empirical and experiential investigations. For example, some key concepts in the model, such as ease of movement and desirability of movement, may require more work to quantify and measure in practical applications. In addition, the model does not consider other factors that may influence employee turnover, such as organizational changes or leadership styles. Therefore, future research must further refine and develop this model to better explain and predict employee turnover behavior.

2.1.5.2 The unfolding model of voluntary employee turnover

Based on traditional turnover models, Lee and Mitchell (1994) proposed an innovative theoretical framework in 1994 - the Unfolding Model of Voluntary Employee Turnover. This model emerged to address the limitations of traditional models in explaining employee turnover,

particularly those cases not directly related to job dissatisfaction or the search for alternative job opportunities as described in traditional models.

Traditional turnover models often focus on JS and the search for alternative job opportunities as the main antecedents of turnover. However, many employees' turnover decision-making processes must align fully with this pattern. Some employees may suddenly leave without apparent dissatisfaction or actively seek other jobs, which puzzles researchers and managers. To explain these atypical turnover phenomena, Lee and Mitchell introduced new concepts and frameworks.

The core of the Unfolding Model lies in its focus on how information is filtered by employees and the critical roles of "scripts" and "images" in turnover decisions. Here, "scripts" can be understood as behavioral patterns or decision-making rules employees form based on past experiences or social norms. At the same time, "images" are cognitive and emotional representations that employees have of themselves, their work, and the organization. In turnover decisions, these scripts and images interact with employees' current experiences and feelings, influencing their decisions.

According to the Unfolding Model, employee turnover decisions may follow four paths, each involving psychological processes and external events.

Decision Path #1 (Script-Driven Turnover): This turnover decision is triggered by certain special events known as "system shocks." These shocking events, which could be unexpected occurrences at work or organizational changes, prompt employees to make turnover decisions based on their existing scripts. During this process, employees recall past experiences and rules, and if the current situation matches their past scripts, they may decide to leave.

Decision Path #2 (Market-Pull Turnover): This turnover decision is also initiated by shocking events but is more influenced by external market factors. When assessing their essential attachment or commitment to the current organization, employees consider job opportunities offered by the external market. If better opportunities are available, employees may choose to leave.

Decision Path #3 (psychological push-out resignation): Employee turnover decisions are often influenced by internal psychological factors such as job dissatisfaction or a sense of misfit with the organization. In response to triggering events, employees reconstruct and apply a decision-making framework to interpret them and assess whether they align with their values, career development goals, and strategic vision. If a mismatch is identified, employees may be inclined to leave.

Decision Path #4 (Emotional Turnover Without Shocking Events): This turnover decision is driven by employees' emotional responses rather than being propelled by specific shocking events or other factors. Employees periodically reevaluate their fundamental commitment to the current organization. If they find that the organization does not align with their values and development trends, it may lead to turnover (M. Zhang & Li, 2002).

The Unfolding Model proposed by Lee and Mitchell holds a pivotal position in the field of turnover research. This model successfully breaks through the shackles of traditional turnover research paradigms and introduces the innovative viewpoint that turnover decisions may be independent of JS levels. Furthermore, by accurately identifying four distinct turnover decision paths, the model provides a more dynamic and comprehensive perspective for understanding employee turnover behavior.

However, like all theoretical models, the Unfolding Model has. For instance, when considering the influencing factors of turnover, the model does not incorporate other subjective attitudinal variables beyond JS, such as organizational loyalty. Further research and clarification are needed on the specific definitions and measurement methods of certain core concepts in the model, such as "system shocks."

Nevertheless, there is no doubt that the Unfolding Model still provides valuable theoretical support and research directions for us to gain insights into employee turnover behavior.

2.1.5.3 Job embeddedness model

In recent years, the Job Embeddedness Model has been a widely recognized theoretical framework in organizational behavior and human resource management. This model was jointly proposed in 2001 by sociologists Mitchell, Terence R., Holtom, Brooks C., and Lee, Thomas W. Drawing inspiration from the essence of embedded figures and field theory (Lewin, 1951), it offers a fresh perspective on understanding employees' decision-making processes regarding whether to stay or leave their jobs. Traditional turnover research focuses on job satisfaction and organizational commitment to predict employees' intentions to leave. However, the Job Embeddedness Model uniquely shifts the focus from "reasons for leaving" to "reasons for staying." This shift in perspective reveals another aspect of employees' decisions to stay and highlights the potential differences in motivations and considerations behind staying versus leaving (Cho et al., 2009; Steel & Lounsbury, 2009; Westaby, 2005).

The Job Embeddedness Model is a multidimensional concept that primarily encompasses two levels: on-the-JE and off-the-JE. On-the-JE emphasizes the degree of employee integration within the work organization. It involves close connections with colleagues, supervisors, work

tasks, and their alignment with organizational values, culture, and goals. On the other hand, off-the-JE focuses on the employee's integration into their personal life, particularly their connections and adaptability within their community, family, and friendships.

To elaborate further on this concept, the Job Embeddedness Model is refined into three core elements: links, fit, and sacrifice.

Links refer to the formal or informal connections individuals establish with institutions or other people. In the Job Embeddedness Model, links are considered a crucial component. When employees form numerous strong connections within and outside the organization, they are more likely to feel deeply integrated into the environment, reducing their willingness to leave. Specifically, factors such as harmonious relationships with colleagues, active participation in team activities, and the social network built in the workplace can effectively enhance employees' sense of connection to the organization, making them more appreciative of their current work environment and less willing to leave. Therefore, the quantity and quality of links largely determine employees' loyalty and intention to stay with the organization.

Fit describes employees' compatibility or comfort level with their organization and its environment. According to Mitchell et al. (2001), employees' values, career goals, and plans must align with the broader organizational culture and the demands of their current jobs (such as job knowledge, skills, and abilities). Additionally, individuals consider their fit with the community and surrounding environment. A higher level of fit increases the likelihood of employees forming solid connections with the organization professionally and personally. Thus, fit is considered a critical dimension in the Job Embeddedness Model. When employees' personal values and career goals closely align with the organization's values and objectives, they are more likely to experience satisfaction and loyalty. Similarly, if employees feel that their lifestyle and interests highly match those of their community, they will be more inclined to stay in that community for the long term.

Sacrifice refers to the perceived cost that employees associate with potential material or psychological losses from leaving their jobs. Specifically, when considering leaving an organization, employees must face various personal losses, such as giving up deep relationships with colleagues, meaningful projects, or benefits they enjoy. The more employees have to give up in the process of leaving, the harder it becomes to sever their ties with the organization (Shaw et al., 1998). Also, leaving may mean forfeiting less obvious but equally critical potential benefits, such as job stability and promotion opportunities (Shaw et al., 1998). Commuting convenience and various company-provided perks may also be lost due to leaving. Therefore, sacrifice becomes a significant factor in the decision-making process related to turnover. When

weighing the pros and cons of leaving, employees must carefully consider various potential losses, including those at the material level (such as salary and benefits) and the psychological level (such as relationships with colleagues and job fulfillment). Employees are likelier to stay than leave if the perceived losses are unbearable.

The Job Embeddedness model provides a more comprehensive perspective on understanding the embedded relationship between employees and the organizational and social environment. This embedded relationship influences employees' turnover decisions and affects their JS, organizational commitment, and job performance. Therefore, understanding and applying the Job Embeddedness model is of significant practical importance for businesses and organizations. By enhancing employees' sense of connection, improving fit, and reducing turnover sacrifices, businesses and organizations can attract and retain talent more effectively, enhancing overall competitiveness and performance.

2.1.6 Overview of TI research

As a reflection of employees' work attitudes and plans, TI has always been a research hotspot in organizational behavior and human resource management. Over the past century, there has been a vast amount of research literature on employee voluntary turnover, numbering at least two thousand articles. Most of these studies have focused on established explanatory structures, such as JS, JE, perception of alternatives, job search behavior, and turnover shock, as antecedents of turnover (T. W. Lee et al., 2017). Among the numerous turnover-related constructs, turnover intention is widely recognized as a direct antecedent and proxy indicator of actual voluntary turnover behavior (Wong & Cheng, 2020). Turnover intention reflects employees' tendency to leave their current jobs and organizations, serving as an essential reference for predicting actual turnover behavior. Most turnover models, such as Mobley's mediational chain model (Mobley et al., 1979), the Price-Mueller model (Price & Mueller, 1981), and the Steers-Mowday model (Steers et al., 1981), consider turnover intention as a precursor to actual turnover. In voluntary turnover, transforming TI into turnover behavior plays a crucial role (Wong & Cheng, 2020). However, despite over a century of research on voluntary turnover, we still need some help, especially in areas requiring further investigation.

Firstly, there is still a need to expand the reconceptualization of the meaning of turnover shock. Turnover shock involves individual-level factors such as JS and career development and is closely related to organizational-level factors like organizational change and leadership style. Therefore, future research should integrate individual and organizational factors to understand the significance of turnover shock more comprehensively. However, there is still a need for

deeper exploration in areas such as reconceptualizing the meaning of shock, examining the nature of alternatives, and expanding the concept of " Job Embeddedness." A complete understanding of the turnover process also requires integrating interdisciplinary elements (Muchinsky & Morrow, 1980).

Secondly, there is a demand for more theoretical and empirical exploration of the nature of alternatives. When considering turnover, employees often evaluate various alternatives, including other job opportunities and entrepreneurship. However, current research on alternatives needs to be more comprehensive, particularly regarding the unclear mechanisms by which different alternatives influence employees' turnover intention. Therefore, future studies should focus more on the nature of alternatives and their impact on turnover intention.

In addition, expanding the concept of " job embeddedness " is also one of the critical directions for future research. Job embeddedness reflects the degree to which employees are embedded in their current jobs, including the closeness of their connections with colleagues, leaders, work tasks, and their sense of identification with the organization. However, current research on JE mainly focuses on its direct impact on TI, and there needs to be more exploration of its interaction with other factors (such as job satisfaction and organizational commitment) and its applicability in different cultural contexts.

Finally, understanding the turnover process requires integrating interdisciplinary elements (Muchinsky & Morrow, 1980). The turnover issue involves knowledge from psychology and sociology and necessitates drawing on theories and methods from other disciplines, such as economics and politics. By integrating interdisciplinary elements, we can more comprehensively and deeply understand turnover's essence and influencing factors, providing more robust support for developing effective turnover management strategies.

In conclusion, although significant progress has been made in research on TI, we still face some challenges and areas that require further in-depth investigation. By continuously expanding and refining existing research frameworks and methodologies, we can better understand and address employee turnover issues, providing more effective support for the development of both organizations and employees.

It is also worth noting that turnover behavior can have a range of impacts on both organizations and individual employees. For organizations, employee turnover may lead to the loss of human capital, disruption of team stability, and increased operational costs. Significantly, when departing employees play vital roles or possess critical organizational skills, their departure can have even more severe consequences on their operations and performance.

For individual employees, turnover may present opportunities and challenges for career development, but it can also come with specific economic and psychological pressures.

Therefore, when studying TI, it is necessary to comprehensively consider the impact of turnover behavior on the organization and individual employees, as well as finding a balance between the organization's needs and respecting and supporting employees' personal development. This is also an important direction for future research. Future research should explore the formation mechanism, influencing factors, and intervention measures of TI to provide organizations with more effective human resource management strategies and methods. At the same time, attention should be paid to the limitations of TI research, and more scientific and objective research methods should be adopted to improve the accuracy and reliability of the research (Niu & Zhang, 2013).

2.2 Leader-Member exchange (LMX)

Leader-Member Exchange theory is a concept that explains how the quality of interaction between leaders and team members affects work behavior and outcomes. It posits that leaders develop quality relationships with different team members, determined by trust, respect, mutual support, and shared goals. When the quality of LMX is high, team members' work enthusiasm, innovation ability, and organizational citizenship behavior are significantly enhanced, promoting individual and overall organizational performance. Therefore, this theory emphasizes the importance of leaders building high-quality relationships with team members and the positive impact of such relationships on work effectiveness.

2.2.1 Definition of LMX

LMX is a highly researched topic in organizational behavior. Its origins can be traced back to a 1975 study by Graen and Cashman on the organizational socialization of new employees, particularly their in-depth exploration of the rule-making model of formal organizational leadership. This study sparked Graen and Cashman's thinking on the nature of interactions between leaders and members and led them to develop an appropriate theoretical framework for such relationships. Later, in 1995, Graen and Uhl-Bien provided a more precise definition of LMX, describing it as "a social exchange between leaders and members based on particular relationships" (Graen & Uhl-Bien, 1995). This definition highlights the dynamic and reciprocal nature of the leader-member relationship, indicating that this exchange is not a one-way

command or obedience, but a two-way interaction based on mutual trust, respect, and shared goals.

The LMX theory further explains that due to leaders' limited time and energy, they inevitably treat their subordinates differently, adopt various management strategies, and establish distinct relationships with different subordinates in fulfilling their responsibilities. In this context, some subordinates form unique connections with their leaders and become "in-group members." These subordinates usually gain more trust and attention from their leaders and enjoy greater autonomy and flexibility, as well as more promotion opportunities and rewards. Those subordinates with more distant relationships with their leaders, who occupy less time and receive fewer reward opportunities, are considered "out-group members." Their relationships with their leaders are often limited to formal work interactions and need deeper communication and trust (Graen & Uhl-Bien, 1995). This phenomenon of in-group and out-group is common within organizations and has been supported by empirical research. For example, a study by Green et al. (1996) confirmed the existence of this phenomenon and emphasized its significant impact on organizational effectiveness and employee satisfaction.

The Leader-Member Exchange theory is crucial in interpreting the interactive dynamics between leaders and team members. It delves deep into the complexities and diversities of leader-subordinate relationships, emphasizing the importance of cultivating high-quality LMX relationships for enhancing organizational performance and individual employee growth. Furthermore, this theory reminds leaders to actively strive for positive and trusting work relationships with all team members, fostering comprehensive organizational progress and development.

2.2.2 Development stages of LMX

Since its inception, the LMX theory has undergone several stages of development and refinement. Graen and Uhl-Bien (1995) systematically summarized four stages of LMX development in their research, providing a clear framework for understanding the evolution of this theory.

In the first stage, the focus was on the socialization process of newcomers and the differences exhibited in the vertical relationship between leaders and subordinates. Studies during this stage revealed that newcomers must undergo a series of socialization processes to adapt to the organization's culture, values, and work methods upon entering a new organization, and leaders play a pivotal role in this process. At the same time, due to differences in personality, ability, trust, and other factors, leaders establish relationships of varying quality with different

subordinates, and this variability has profound impacts on subsequent job performance and career development paths.

Moving into the second stage, the focus gradually shifted to optimizing the quality of LMX relationships in the work environment and exploring the intrinsic connections between this relationship quality and its antecedents and outcome variables. Research findings during this stage revealed that high-quality LMX relationships can significantly enhance employees' JS, organizational loyalty, and work effectiveness and support their career development and personal growth. Therefore, how to effectively improve and enhance the quality of LMX relationships became the central research topic during this stage.

In the third research stage, the LMX theory achieved a breakthrough by proposing that leaders and subordinates should jointly construct a work and life vision based on partnership. This stage emphasized that the relationship between leaders and subordinates should not be limited to the traditional hierarchical model but should shift towards an equal, mutually trusting, and cooperative partnership. In such a partnership, both parties can work together to set work goals, plan career development paths, and address challenges in the workplace, jointly realizing a beautiful vision for work and life.

By the fourth stage, the LMX theory further expanded its scope of application, moving beyond mere dyadic relationships to the team level, forming Team-Member Exchange (TMX). Research at this stage suggests that, like LMX relationships, leaders and members within teams also establish relationships, and the quality of these relationships similarly affects team performance and members' career development. Therefore, how to establish and manage high-quality TMX relationships at the team level has become the new focus of research at this stage.

However, despite the development of the LMX theory into its fourth stage, most current research still focuses on the first and second stages (Ren & Wang, 2005). This may be because the issues addressed in these two stages are more fundamental and more accessible to study and validate empirically. In the future, with the deepening of research and the innovation of methods, we believe that the LMX theory will play an explanatory and predictive role in more fields and levels.

2.2.3 The structure of LMX

The structure of LMX has been one of the focal points of research in organizational behavior. Due to differences in scholars' definitions and emphases on LMX, its structure has evolved from unidimensional to multidimensional.

In early studies, LMX was viewed as a unidimensional concept, where the quality of the exchange relationship between leaders and members was seen as a continuum, with high-quality "in-group exchange" at one end and low-quality "out-group exchange" at the other. Under this viewpoint, LMX was considered a single metric for measuring the quality of relationships between leaders and employees. To quantify this concept, scholars designed a series of scales, such as those by Dansereau et al. (1975) and Graen et al. (1982), which were widely used and validated in subsequent research.

However, as research progressed, the unidimensional perspective came under scrutiny. Scholars argue that the exchange relationship between leaders and members involves multiple aspects and that a single dimension might be too simplistic. Thus, the multidimensional perspective gradually emerged.

Dienesch and Liden (1986) were early advocates of the multidimensional view, proposing that LMX should encompass multiple dimensions such as effect, loyalty, contribution, and professional respect. Together, these dimensions constitute the rich connotation of LMX. Subsequently, Graen and Uhl-Bien (1995) put forward their perspective, arguing that LMX comprises three dimensions: respect, trust, and obligation. These dimensions overlap with but also differ from those proposed by Dienesch and Liden, as the respect dimension emphasizes the leader's recognition of the member's abilities.

Based on the multidimensional perspective, Liden and Maslyn (1998) further refined the dimensions of LMX, proposing a four-dimensional structure that includes effect, loyalty, contribution, and professional respect. This viewpoint has received widespread support from subsequent research, such as the study by Eisenberger et al. (2010), which confirmed the stability and validity of this structure.

In addition to those above mainstream dimensional classification methods, other scholars have proposed different perspectives. For instance, Schriesheim et al. (1999) advocated that LMX should encompass three dimensions: liking, latitude, and mutual support. This classification approach differs from previous viewpoints and offers a new perspective for understanding the structure of LMX.

In China, some scholars have also conducted relevant research on the dimensions of LMX. For example, H. Wang et al. (2004), taking into account China's cultural background and organizational characteristics, proposed a classification method that includes four dimensions: guanxi (relationship), task, affect, and responsibility. This classification, to some extent, reveals the influence of Chinese culture on the structure of LMX.

In summary, the LMX structure has transitioned from unidimensional to multidimensional, with scholars proposing various delineations based on their research backgrounds and focuses. These delineations each have their strengths and weaknesses, but they all provide valuable insights into understanding the essence and structure of LMX. In the future, with further research and methodological innovations, we can gain a more comprehensive and in-depth understanding of the structure of LMX.

2.2.4 Antecedent and outcome variables of LMX

The antecedents and outcome variables of LMX play a crucial role in interpreting the mutual relationships between leaders and subordinates within organizations. Antecedent variables reveal vital factors influencing the relationship quality between both parties, such as individual characteristics and the interaction processes, offering valuable guidance for building high-quality leader-subordinate relationships. Simultaneously, outcome variables are closely linked to employees' job effectiveness, satisfaction, and loyalty, which are crucial for the success and stability of the organization. Therefore, an in-depth exploration of the antecedents and outcome variables of LMX holds immeasurable significance for enhancing leadership effectiveness, optimizing employee performance, and maintaining organizational competitiveness.

2.2.4.1 Antecedent variables of LMX

LMX, as a core construct in organizational behavior, has long been a focal point of academic research, particularly regarding its antecedent variables. These antecedent variables operate in various ways in the formation and evolution of LMX, thereby influencing the quality of exchange relationships between leaders and members. According to the model proposed by Liden et al. (1997), the antecedent variables of LMX mainly involve the personality traits of subordinates and leaders, the congruence between both parties, and certain situational factors.

Firstly, the characteristics of subordinates play a significant role in the formation of LMX. Specifically, the job performance of subordinates serves as a critical variable. Those subordinates who exhibit high performance often gain recognition and appreciation from their leaders, establishing high-quality exchange relationships (Dockery & Steiner, 1990).

Furthermore, subordinates' cognitive abilities, negative affectivity, extraversion, and other personality traits can also impact the quality of their exchange relationships with leaders (Day & Crain, 1992; Phillips & Bedeian, 1994). For instance, subordinates with high cognitive abilities and extraversion may find it easier to establish good communication and interaction with their leaders.

In addition to personality characteristics, some positive behaviors exhibited by subordinates also serve as critical antecedent variables in shaping the LMX relationship. These behaviors include ingratiation, opinion conformity, enhancement, bargaining, assertiveness, high authority, and coalition formation (Deluga & Perry, 1994; Dockery & Steiner, 1990). These actions help subordinates gain more resources and support within the organization, enhancing the quality of their exchange relationship with their leaders.

Secondly, the characteristics of leaders also impact LMX. Positive affectivity is an essential trait of leaders, and those with positive affectivity tend to establish more positive exchange relationships with their subordinates (Day & Crain, 1992). Leaders with positive affectivity are likelier to adopt a favorable and open attitude toward their subordinates, facilitating communication and interaction between the two parties.

The congruence between leaders and subordinates is also one of the critical factors influencing LMX. This congruence includes consistency in gender, abilities, and power needs (Duchon et al., 1986; McConkie, 1979). When leaders and subordinates maintain consistency in these aspects, they are more likely to establish mutual trust and understanding relationships, enhancing the quality of exchange relationships.

Furthermore, situational factors also play a role in shaping LMX. These factors include workload, the availability of financial resources, group size, group composition, leadership power, organizational policies, and culture (Dienesch & Liden, 1986; Green et al., 1996). For instance, the exchange relationship between leaders and subordinates may come under pressure and challenges under high workloads and limited financial resources. Conversely, when leaders possess significant power and organizational support, the exchange relationship will likely be more positive and stable.

Since Dienesch and Liden (1986) and Liden and Maslyn (1998) proposed that LMX has a multidimensional structure, numerous scholars have explored the impacts of various antecedent variables on different dimensions of LMX.

From the perspective of social exchange theory, Maslyn and Uhl-Bien (2001) pointed out that LMX is essentially a form of social exchange, albeit with distinct differences in the needs of both parties involved. Specifically, leaders anticipate receiving work-related rewards from their subordinates (such as exceptional performance and successful task completion). In contrast, subordinates aspire to gain socio-emotional fulfillment from their leaders (like support, recognition, and career development opportunities).

Within the multidimensional framework of LMX, the dimension of "contribution" predominantly focuses on job-related aspects. At the same time, "loyalty," "affect," and

"professional respect" are more prominent in the socio-emotional realm. Through empirical research, they discovered that leaders' perception of subordinates' efforts primarily influences the contribution dimension, whereas subordinates' perception of leaders' efforts predominantly affects the dimensions of professional respect and loyalty.

Evidently, in the formation of LMX relationships, the effort expended by both parties and their respective perceptions of each other's efforts play pivotal roles.

In summary, numerous antecedent variables influence LMX relationships, including the personality traits of subordinates and leaders, their congruence, and various situational variables. These factors influence the formation and development of LMX relationships through diverse pathways, ultimately determining the quality of exchange relationships between leaders and members (Ansari et al., 2007). Future research can delve into the interactions among these antecedent variables and analyze in-depth their specific mechanisms affecting different dimensions of LMX, aiming to provide more valuable insights for theory and practice.

2.2.4.2 Outcome variables of LMX

LMX, as a core theory describing the interactive relationship between leaders and members within an organization, has extensive and profound impacts on individual employee performance and overall organizational effectiveness through its outcome variables. According to the LMX theoretical framework, a high-quality LMX relationship is a crucial predictor of effective employee job performance, which can positively influence the organization.

LMX shapes employee work attitudes and JS. Much empirical research confirms that high-quality LMX relationships can significantly influence subordinates' work attitudes and JS (Green et al., 1996). When employees perceive steadfast support, genuine recognition, and deep trust from their leaders, they are likelier to hold positive attitudes towards work and invest more enthusiasm and energy. This positive work attitude is crucial for enhancing individual employee performance. It strengthens employees' sense of belonging and loyalty to the organization, thus laying a solid foundation for its long-term stability and development.

Secondly, LMX also significantly impacts information communication efficiency and decision-making quality. A high-quality LMX relationship can promote effective communication between leaders and members (Dockery & Steiner, 1990), enabling the smooth transmission of information between the two parties. This helps improve the quality of organizational decision-making (Maslyn & Uhl-Bien, 2001) and enhances the organization's adaptability and innovation capabilities. When leaders can timely understand the ideas and

suggestions of members, they are more likely to make wise and creative decisions, thereby promoting organizational development.

In addition, LMX significantly influences organizational citizenship behavior and employee turnover intention. A high-quality LMX relationship can stimulate employees' organizational citizenship behavior, making them more willing to go above and beyond for the organization's interests (Wayne & Green, 1993). At the same time, this high-quality interactive relationship can effectively reduce employees' turnover intention and deepen their sense of belonging and loyalty to the organization, which is crucial for organizational stability and development. Furthermore, LMX also predicts employee outcomes, such as promotions and compensation within the organization. For example, Wakabayashi et al. (1988) found in a longitudinal study of a Japanese sample that a high-quality LMX relationship can predict employees' future career trajectories. This highlights leaders' supportive and guiding role in employees' career development. However, current research in this area is still insufficient, and conclusions are not yet unified. In the future, more empirical studies are needed to validate and expand these findings, providing more robust support for theory and practice.

It is worth emphasizing that LMX is a continuously evolving process, and existing LMX relationships can influence the sustained efforts made by both parties to maintain or improve their status. Vecchio et al. (1986) pointed out that in low-quality LMX relationships, both parties may become trapped in a fixed mindset, believing that the relationship cannot be changed and thus cease efforts to improve it. This negative attitude may lead to further deterioration of the relationship, forming a vicious cycle that is difficult to break. Conversely, in high-quality LMX relationships, both parties are more willing to continuously invest in maintaining this positive relationship.

However, research findings on improving low-quality LMX relationships are mixed. Scandura and Graen (1984) showed that despite the desire of subordinates in low-LMX relationships to improve the relationship, they often need to put this into practice. On the other hand, Maslyn and Uhl-Bien's (2001) empirical study revealed that in low-LMX relationships, both parties aspire to enhance the relationship and believe they have made efforts. However, the relationship has yet to experience substantial improvement. These findings suggest the presence of cognitive biases or communication barriers in low-LMX relationships, hindering the effectiveness of efforts to improve the relationship. Furthermore, these studies also found that leaders in low-LMX relationships tend to overestimate their level of effort, perceiving themselves as having invested more than their subordinates, which may further deepen misunderstandings and conflicts between the two parties.

2.2.5 A review of LMX research

The LMX theory, based on social exchange theory and role theory, reveals the dynamics of relationships between leaders and members. The core of this theory emphasizes the differentiated exchange relationships between leaders and different members, acknowledging that leaders, due to time and resource constraints, cannot establish identical relationships with every subordinate. Therefore, leaders selectively establish relationships of varying depth with employees based on their acceptance of the expected role and whether their job performance meets expectations (Cleyman et al., 1995; Dienesch & Liden, 1986).

Within the theoretical framework of LMX, a core concept is the distinction between "in-group" and "out-group" members. Those subordinates who establish high-quality interactive relationships with their leaders are considered "in-group" members, enjoying greater access to trust, support, and resources from their leaders, thereby forging deep bonds of mutual respect and reliance. Conversely, subordinates with lower-quality relationships with their leaders are categorized as "out-group" members, whose interactions with leaders are often limited to fulfilling essential and routine job duties and responsibilities (Deluga & Perry, 1994; Graen & Uhl-Bien, 1995; Loi et al., 2009; Sparrowe & Liden, 1997). This differentiated interaction pattern profoundly impacts individual-level outcomes such as JS, performance, and organizational loyalty and has extensive and far-reaching effects on team and organizational effectiveness.

Since the inception of the LMX theory, it has garnered widespread attention in academia and received extensive support from empirical research. However, despite the continuous deepening and expansion of LMX through research, it also faces various challenges and criticisms.

Firstly, LMX emphasizes the interactive relationship between leaders and followers, yet most existing studies approach it from the employee's perspective, exploring how LMX affects their attitudes and behaviors. Few studies focus on the impact of LMX on leaders, such as their satisfaction, job performance, and TI (Dulebohn et al., 2012; Greenberg et al., 2007). This imbalance in research perspectives limits our comprehensive understanding of LMX relationships.

Secondly, the measurement issue concerning LMX has always been challenging in this field. Currently, there is no universally accepted measurement tool, and scholars typically rely on scales they have developed themselves or slightly modify scales developed by others for their studies. The diversity and inconsistency of these measurement methods make it difficult

to compare and integrate research results, thus limiting the further development of LMX theory (Dienesch & Liden, 1986; Gerstner & Day, 1997; Liden & Maslyn, 1998). Future research should focus on developing more universal and stable measurement tools for LMX to reflect better the nature and dynamic formation process of LMX relationships.

Moreover, research findings on LMX exhibit some inconsistencies across different cultural contexts. Guo (2011) suggests that LMX may not be sufficiently applicable when describing superior-subordinate relationships in Chinese contexts, possibly due to differences between the concept of "guanxi" in Chinese culture and the Western concept of LMX. Deng et al. (2017) argue that more research is needed on the localization and theoretical deepening of LMX in China, limiting its application and development in Chinese contexts. Therefore, expanding the boundaries of LMX to better adapt to different cultural and organizational contexts represents another crucial issue for future research.

Additionally, most existing studies focus on the impact of LMX on individual-level outcome variables, with fewer cross-level studies considering the influence of team and organizational factors such as team climate and organizational culture (Pan et al., 2012; Portoghese et al., 2015; Sun et al., 2013). This cross-level perspective is essential for a more comprehensive understanding of the influencing factors and outcome variables of LMX relationships, providing more targeted practical recommendations for organizations.

In Chinese culture, "guanxi" is a bond that maintains interpersonal harmony and is a foundation for smooth organizational operation. Maslow's hierarchy of needs theory reminds us that employees within organizations aspire for satisfaction not only at the material level but also at the social and spiritual levels. Therefore, studying LMX in the Chinese context is particularly significant. By profoundly examining the formation process, influencing factors, and outcomes of LMX relationships, we can provide more targeted leadership and team management strategies for organizations, promoting continuous progress and innovation.

2.2.6 The relationship between LMX and TI

According to the core viewpoint of the LMX theory, the quality of the exchange relationship between employees and leaders profoundly impacts employees' work attitudes and behaviors. Within this framework, the concepts of "in-group" and "out-group" members reveal the differences in this relationship. Subordinates considered "in-group" members not only have the opportunity to participate in essential decision-making processes but also receive additional tasks and more opportunities for interaction with their leaders. This close collaborative relationship fosters mutual understanding and trust between leaders and subordinates, bringing

higher JS, better performance, and lower employee work stress. Simultaneously, this high-quality exchange relationship increases the frequency of communication between leaders and subordinates, further enhancing work efficiency and team innovation outcomes.

In contrast, subordinates perceived as "out-group" members may be ignored by leaders, lacking opportunities for performance and advancement. Due to their distance from the leadership, they rarely have the chance to participate in decision-making processes or receive recognition and promotion from their leaders. This low-quality exchange relationship results in poor job performance and exposes employees to higher stress levels and dissatisfaction. Over time, as "out-group" members continue to feel undervalued and overwhelmed, their sense of self-efficacy diminishes, making them more prone to considering resignation and seeking new job opportunities.

Furthermore, a high-quality LMX can provide employees with additional opportunities for career development. Through introductions and recommendations from leaders, employees can expand their social networks and connect with key individuals in other organization departments (Sparrowe & Liden, 1997). These expanded social networks may offer greater visibility, access to information, and other forms of support (Burt, 1992), enhancing the employee's career competitiveness and willingness to stay. Thus, the quality of the supervisor-subordinate relationship directly impacts the subordinate's TI. Relevant studies have also shown that the LMX metric better predicts turnover rates than employee attitude metrics (Graen et al., 1982; Mobley et al., 1979). This underscores the significance of establishing a high-quality exchange relationship with leaders to reduce employees' desire to leave.

Based on the above literature and discussion, we can propose the following hypothesis:

H1: LMX is negatively related to TI.

2.3 Job embeddedness (JE)

Job embeddedness theory is a comprehensive theoretical framework that explains why employees stay or leave their jobs. It emphasizes the multidimensional connections between employees and their work, organization, and community, encompassing three core elements: links, fit, and sacrifice. These elements collectively determine the degree of an employee's job embeddedness, indicating how deeply they are "embedded" in their current job, organization, and community. The theory of job embeddedness offers a fresh perspective for understanding employees' decisions to stay or leave, aiding organizations in developing more effective human

resource management strategies. Organizations can reduce turnover rates and foster stability and growth by enhancing job embeddedness.

2.3.1 The definition of JE

When exploring the intricate phenomenon of employee turnover, the unfolding model proposed by Lee and Mitchell (1991, 1994) provides us with a macroscopic analytical framework. However, to gain a deeper understanding of the close interaction between individuals and their work environment, Mitchell et al. (2001) innovatively introduced the concept of " job embeddedness." This concept goes beyond traditional factors that predict turnover, such as JS and organizational loyalty, instead focusing on how individuals are deeply "embedded" in their work, organization, and community. Specifically, it encompasses. the extent of an individual's connections with others, teams, and groups, the individual's sense of adaptation and integration into the work, organization, and community, and the sacrifices required to leave.

Mitchell et al. (2001) defined JE as "a comprehensive concept that encompasses the various factors that keep individuals in their current jobs." In other words, JE is a multidimensional concept that reflects the close connection and mutual dependence between individuals and their work environment. These connections and dependencies collectively constitute a powerful "retention force," leading individuals to face more resistance and costs when considering leaving.

Burton et al. (2010) further argue that JE contributes significantly to our understanding of how individuals weigh the decision to leave their current employment. When contemplating turnover, individuals assess the attractiveness of a new job and consider the sacrifices and costs associated with leaving their current position. Consequently, JE offers a helpful framework for minimizing the potential negative impact of departing from an organization.

In summary, JE emerges as a comprehensive construct that unveils the intricate and multidimensional relationships between individuals and their work environments. By delving into its three dimensions (links, fit, and sacrifice), we can more accurately predict and comprehend employee turnover behavior, providing valuable support for organizations in crafting more effective retention strategies.

2.3.2 Dimensions of JE

When Mitchell et al. (2001) introduced the concept of JE, they delved into its multidimensional nature. They argued that JE represents an employee's various connections and attachments

within an organization and reflects the close relationship between the employee and the external environment, particularly the community. This kind of connection is often likened to a "net," and employees are the individuals who are "stuck" in this net. Each strand of the net represents the connection between employees and different aspects. The more strands and the tighter the connection, the harder it is for employees to escape from this net, that is, to leave the current organization.

Job embeddedness comprises three core dimensions: links, fit, and sacrifice. These dimensions can be subdivided into organizational and community sub-dimensions (M. Zhang et al., 2012).

2.3.2.1 Links

The links dimension focuses on the formal and informal networks of relationships that employees establish with their organization and community. The JE theory posits that employees and their families have extensive attachments to their surroundings across multiple social, psychological, and financial levels. These attachments extend beyond colleagues in the workplace to include friends, groups, and their community.

Employees may develop strong bonds with colleagues from a particular work team. These connections are fostered through cooperation, communication, and interaction, forming an integral part of organizational links (T. W. Lee et al., 2004). Such links are not confined to task-related collaboration but encompass social activities, team-building exercises, and cultural sharing. Through these links, employees perceive themselves as integral to the organization, enhancing their sense of belonging and loyalty.

At the community level, employees' connections are more diverse and personalized. They may establish ties with neighbors, friends, social groups, religious organizations, and other community members (T. R. Mitchell, Holtom, Lee, et al., 2001). These links provide employees with social support, emotional anchors, and a sense of identity, enabling them to find fulfillment and belonging outside work.

2.3.2.2 Fit

The fit dimension powerfully underscores the significance of alignment between employees, organizations, and communities across values, goals, culture, and capabilities. Organizational fit refers to the congruence between the personal characteristics of employees and the culture, strategy, and objectives (T. W. Lee et al., 2004). When employees perceive that the organization respects their values and that their abilities and skills are fully utilized, they are more likely to

experience job satisfaction and engagement. This alignment enhances the employee's work experience and is a critical factor in the organization's ability to achieve its goals.

On the other hand, community fit pertains to the degree of adaptability of employees to the environment, lifestyle, and cultural practices of their surrounding community (T. R. Mitchell, Holtom, Lee, et al., 2001). For instance, an employee prioritizing family life may reside in a community with excellent educational resources and convenient amenities. The higher the level of this fit, the more willing the employee will be to remain in that community and workplace.

2.3.2.3 Sacrifice

Sacrifice refers to the psychological, social, or material costs an individual incurs when leaving an organization or community (T. W. Lee et al., 2004; T. R. Mitchell, Holtom, Lee, et al., 2001). When employees choose to depart from an organization, they may encounter work-related losses such as the absence of interactions with familiar colleagues, the inability to continue participating in engaging projects, or the loss of satisfactory benefits and perks. Similarly, leaving a community might also entail sacrifices like the convenience of commuting, access to quality educational resources, or specific benefits provided by the company.

In the job embeddedness theory, the sacrifice dimension measures the material and non-material benefits employees would relinquish upon leaving an organization or community. These sacrifices encompass stable career development opportunities, generous compensation and benefits packages, and established professional networks (T. W. Lee et al., 2004). The consideration of these factors is crucial for understanding employees' turnover decisions. These sacrifices make employees more cautious and hesitant when contemplating leaving their positions.

At the community level, sacrifice might involve giving up a convenient living environment, familiar cultural practices, and social circles (T. R. Mitchell, Holtom, Lee, et al., 2001). These aspects influence an employee's overall evaluation of the decision to leave. When the perceived sacrifices associated with departing are too significant, employees are likelier to remain within their existing organizations and communities.

2.3.3 Measurement of JE

The assessment of JE is primarily conducted through questionnaires carefully designed to capture the connections between employees and their work environment from different perspectives. These questionnaires can be broadly classified into two types: comprehensive measurement and global measurement.

2.3.3.1. Comprehensive measurement

Comprehensive measurement is a thorough and detailed assessment method encompassing multiple aspects of JE. Mitchell et al. (2001) originally developed a comprehensive scale of 40 items, covering six dimensions of overall JE: on-the-job and off-the-job links, fits, and sacrifices. To validate this scale, they conducted empirical studies in a regional grocery store and a community hospital, revealing Cronbach's α coefficients of 0.85 and 0.87, respectively, indicating good internal consistency.

As research on JE theory progressed, many scholars revised and refined the original scale based on Mitchell et al.'s work. For instance, T. W. Lee et al. (2004) reduced the scale to 34 items while maintaining reliability and validity. Holtom et al. (2006) further simplified the original measurement, proposing a shorter version with only 21 items, more suitable for use in fast-paced work environments. Ramesh and Gelfand (2010) took a more innovative approach by eliminating certain items and introducing a new dimension of family embeddedness to more comprehensively reflect employees' connections to their work environment. This new dimension demonstrated good reliability with a Cronbach's α coefficient exceeding 0.75.

Despite the theoretical richness of comprehensive measurement, which can cover non-attitudinal and non-work components, Crossley et al. (2007) pointed out that it also has some theoretical and statistical limitations. For example, comprehensive measurement may be overly complex, causing respondents to feel confused or fatigued when completing the questionnaire. Additionally, since it covers multiple dimensions, it may be challenging to determine which dimension has the most significant impact on overall JE.

2.3.3.2 Global measurement

Crossley et al. (2007) proposed a more concise global measurement approach to overcome the limitations of comprehensive measurement. This method assesses the general connection between employees and the organization rather than delving into specific dimensions. Global measurement typically includes fewer items; for instance, the global JE scale developed by Crossley et al. consists of only seven items. These items are rated using a Likert 5-point agreement scale, allowing respondents to complete the questionnaire more quickly.

The advantages of global measurement lie in its simplicity and ease of use. With fewer items, respondents are more likely to find time to complete the questionnaire during busy workdays. Additionally, global measurement provides an overall assessment result, helping organizations quickly understand employees' perceptions of the work environment.

However, global measurement also has some potential drawbacks. Since it does not distinguish between on-the-job and off-the-job factors nor explore the dimensions of links, fits, and sacrifices, it may not provide detailed information to guide specific interventions. Furthermore, the reliability of global measurement may be affected by the limited number of items. Nonetheless, the global JE scale developed by Crossley et al. demonstrated good internal consistency with a Cronbach's α score of 0.853.

In summary, both comprehensive and global measurements have their advantages and disadvantages. Organizations can choose the appropriate measurement method to assess employees' job embeddedness based on their needs and contexts.

2.3.4 Cross-cultural and organizational extensions of job embeddedness theory

The unique predictive ability of JE has been repeatedly demonstrated, showing applicability across different countries and cultural backgrounds and within various organizations. Agrawal and Singh (2017) further support this by noting that JE significantly predicts national and organizational outcomes.

To explore the cross-cultural applicability of job embeddedness theory, Tanova and Holtom (2008) conducted a large-scale study in four European countries: Denmark, Finland, Italy, and Spain. They investigated the relationship between embeddedness and voluntary employee turnover, carefully controlling for potential confounding factors such as gender, age, income, higher education level, JS, job search behavior, and absenteeism. After rigorous analysis, they found that JE played a crucial role in predicting turnover, indicating that turnover decisions are not solely determined by individuals' attitudes toward their jobs or the actual opportunities in the labor market but are also influenced by various interconnected factors inside and outside work. This study confirms the universality of JE theory, suggesting that despite differences in labor laws, cultural factors, and unemployment rates between Europe and the United States, JE appears to be an effective predictor of employee turnover in both continents.

In the context of cross-cultural research, Ramesh and Gelfand (2010) extended the scope of JE theory. They investigated whether the predictive validity of JE could be generalized from individualistic to collectivistic cultures, specifically in the United States and India. Additionally, they explored whether the sub-dimensions of JE might have different predictive strengths across cultures and introduced the new concept of family embeddedness. Using various control variables in their analysis, a sample of call center employees in the United States and India found that JE had significant predictive validity in both Indian and American contexts. Interestingly, their research revealed that the fit dimension of JE in the United States was a

stronger predictor of TI than in India. In contrast, the links dimension was a more effective predictor in India than in the United States. Ultimately, they concluded that family embeddedness had a significantly higher predictive effect on turnover rates than JE and other control variables in both countries.

In addition to cross-cultural research, applying JE theory has garnered significant attention across different types of organizations. For instance, a study by T. W. Lee et al. (2004) in a large multinational bank found that JE predicted employees' TI and in-role and extra-role performances. Similarly, Mallol et al. (2007), in their research in a banking company, discovered that despite systematic differences in JE levels between U.S.-born and non-U.S.-born employees (primarily Hispanic), the overall construct still effectively predicted voluntary turnover for both groups. These studies demonstrate the broad applicability of job embeddedness theory within private sector organizations.

Furthermore, it is worth noting that in their meta-analysis, Jiang et al. (2012) pointed out that JE exhibits even stronger explanatory power in predicting TI and actual turnover in public sector organizations. This suggests that the theory is valid in the private sector and holds significant value in the public sector. Therefore, job embeddedness theory exhibits robust predictive ability and explanatory power across national boundaries and within different types of organizations.

2.3.5 Overview of JE research

The introduction of the job embeddedness theory has undoubtedly been a landmark contribution to employee turnover research. This theory provides a new perspective for explaining employee turnover phenomena and complements traditional turnover theories' shortcomings in certain aspects.

Traditional turnover theories, such as the model proposed by March and Simon (1958), mainly focus on the decision-making process of voluntary employee turnover. These theories suggest that employees base their assessments on perceived ease of movement and desirability when making turnover decisions. Briefly, dissatisfied employees search for other potential job opportunities and compare them to their current jobs through a cost-benefit analysis. Employees tend to leave if another job is perceived as more attractive than the current one (Mobley, 1977). However, traditional turnover theories have limitations in explaining employee turnover phenomena. For instance, research findings indicate that work attitudes have a relatively small overall impact on employee turnover decisions (Griffeth et al., 2000; Hom & Griffeth, 1995).

This suggests that in addition to traditional considerations such as JS and organizational commitment, other important factors influence employees' decisions to leave.

The "Unfolding Model" has further expanded the turnover theory, emphasizing that JS is only one factor that drives employees to leave (T. W. Lee et al., 1996, 1999). This model underscores the role of job alternatives and other non-work factors in employee turnover. Maertz and Gampion (1998) also pointed out that besides JS, organizational commitment, and job alternatives, other crucial factors exist for understanding employee turnover rates. However, despite these studies providing more clues for understanding employee turnover, why employees choose to stay still needs to be understood. Mitchell et al. (2001) proposed an innovative theoretical framework for JE in this context. The job embeddedness theory emphasizes the significant role of non-attitudinal and non-work factors in understanding employees' attachment to organizations. By demonstrating how employees become entangled in the organizational network (through links, fit, and sacrifice) and still choose to stay despite facing unfavorable circumstances, the theory of job embeddedness provides a fresh perspective to explain the phenomena of employee turnover and retention.

In addition, the theory of job embeddedness reminds us that relying solely on financial incentives and employee satisfaction to retain staff may be overly limited. Numerous non-financial and non-attitudinal factors firmly bind employees to the organization, keeping them in their current positions. Therefore, future research must employ a broader range of tools, including non-attitudinal and non-work factors, to delve deeper into employee turnover and retention phenomena.

Despite the significant progress made by JE theory in explaining employee turnover, there are still areas for improvement. For instance, the measurement methods for JE require further refinement and optimization. Future research should focus on developing more precise and reliable measurement tools to enhance JE theory's predictive validity and applicability. Additionally, cross-cultural and cross-industry studies can be conducted further to validate the universality and applicability of JE theory.

2.3.6 The relationship between JE and TI

Since T. R. Mitchell et al. (2001) first introduced the concept of JE theory, it has garnered widespread attention in employee turnover research. JE is the degree to which employees are embedded in their work or organization, reflecting various connections and ties between employees and their work or organization (Sekiguchi et al., 2008). These connections and ties include traditional work attitude factors such as JS and organizational commitment (Hossein &

Somayeh, 2018) and a range of non-work factors such as community connections, family factors, and lifestyle compatibility.

Numerous studies have demonstrated that a higher level of JE is associated with a lower turnover rate (Crossley et al., 2007). This is because highly embedded employees have established strong connections and ties within their job or organization, which increases the costs and difficulties associated with leaving. Conversely, less embedded employees are more susceptible to external job opportunities due to their weaker ties to the job or organization.

JE is a critical mediating construct between specific on-the-job and off-the-job factors and employee retention (T. R. Mitchell, Holtom, Lee, et al., 2001). In other words, JE explains why certain employees, facing similar work environments and turnover factors, choose to remain with an organization rather than leave immediately. This is because JE captures the unique connections and ties between employees and their work or organization that are often overlooked in traditional turnover theories.

Furthermore, JE has been revealed to mediate between job aspects and critical organizational outcomes (Holtom & Inderrieden, 2006). For instance, research has found that JE significantly predicts key organizational outcomes such as employee job performance (T. W. Lee et al., 2004), organizational citizenship behavior, and turnover intention (T. R. Mitchell, Holtom, Lee, et al., 2001). This suggests that JE plays a crucial role in employees' turnover decisions and significantly impacts their behavior and performance within the organization.

Based on the above literature review and discussion, we propose the following hypothesis:

H2: JE is negatively related to TI.

2.4 Job satisfaction (JS)

Job satisfaction reflects employees' subjective evaluation and emotional experience towards work and the work environment. It uncovers the degree to which employees' needs are met and their feelings towards various aspects of their job. The level of JS directly correlates with employees' work motivation, performance, and TI, making it a crucial metric for organizations to assess their staff's psychological state and work effectiveness.

2.4.1 Definition of JS

Job satisfaction, a core concept in organizational behavior and human resource management, has been a research hotspot since the 20th century (Judge et al., 2017). This concept has garnered significant attention from scholars and holds a pivotal position in corporate practices.

JS is directly related to employees' work efficiency, career development, and quality of life. For organizations, employee JS is critical to measuring organizational health, productivity, and retention.

Numerous scholars have offered definitions from different perspectives within the research domain of JS. As early as the 1930s, Hoppock (1935) proposed that JS stems from a "specific combination of psychological and environmental conditions" that leads individuals to experience JS. This definition emphasizes the influence of external environments and psychological factors on the formation of JS. With the gradual deepening of research, Locke (1976) elaborated on the essence of JS, defining it as a "pleasurable emotional state resulting from an individual's positive evaluation of their work or work experience." This definition underscores the significant role of individual emotions and cognitive evaluations in JS.

Entering the 21st century, understanding JS has become more diversified and comprehensive. According to Yousef (2017), JS is "an employee's attitude towards their work, organization, social and physical work environment, and the rewards they receive." This definition encompasses various aspects of work while emphasizing employees' perceptions and evaluations of the work environment and rewards. Meanwhile, Schultz Duane P. and Schultz Sydney Ellen (2012) take a broader perspective, stating that JS involves "employees' positive attitudes towards their responsibilities, work environment, and colleagues, or positive and negative feelings and attitudes related to the professional duties they perform." This definition extends the scope of JS to aspects such as employees' careers and social interactions.

JS is a multifaceted concept that encompasses specific areas like the work itself, work environment, and colleague relationships, as well as abstract levels such as satisfaction with career development and organizational identification. These different satisfaction levels intersect and influence each other, collectively shaping employees' overall evaluation and emotional attitude toward their work.

In practice, enhancing employee JS is crucial for organizations. Satisfied employees often demonstrate higher productivity and creativity, creating more organizational value. At the same time, they are more likely to develop a deep sense of loyalty and belongingness toward the organization, which helps reduce employee turnover and recruitment costs. Therefore, organizations can enhance employee satisfaction and happiness by optimizing the work environment, providing professional training and development opportunities, and establishing fair and reasonable incentive mechanisms.

2.4.2 Dimensions of JS

As a crucial metric for gauging employees' psychological state and work experience, JS has dimensions essential for comprehensively understanding and assessing employees' satisfaction. Generally, the dimensions of JS can be viewed from unidimensional and multidimensional perspectives.

From a unidimensional perspective, JS is considered a holistic and unified construct without further distinguishing specific dimensions or aspects. This measurement approach typically employs a single question or a brief questionnaire to evaluate employees' JS. For instance, it may involve asking employees about their overall satisfaction with their job or their level of agreement with certain statements (Agho et al., 1992). The advantage of this method lies in its simplicity (Gaied et al., 2009) and ease of administration, allowing for quick insights into employees' overall feelings about their work. However, a unidimensional measurement may fail to capture variations in satisfaction across different work areas or aspects, potentially overlooking critical details.

In contrast, the multidimensional perspective focuses on distinct aspects and dimensions of JS and measures them separately. Multidimensional measurements commonly encompass various areas such as compensation, incentive programs, interpersonal relationships (including relationships with superiors and colleagues), the company's market position, others' perceptions of the organization, the organization itself, and the nature of the work (Wyrwa & Kaźmierczyk, 2020). Organizations can obtain more detailed and comprehensive information about employees' JS by adopting a multidimensional approach. This, in turn, enables them to identify employees' needs, expectations, potential issues, and areas more accurately for improvement. Additionally, multidimensional measurements help organizations understand the relative importance employees place on different work areas or aspects, allowing for more targeted human resource management and organizational development strategies.

In conclusion, whether viewed from a unidimensional or multidimensional lens, JS measurements provide organizations with vital information about employees' psychological states and work experiences. Organizations should select appropriate measurement methods based on specific research objectives and contexts in practical applications. They should also combine these measurements with other relevant metrics and data to evaluate employees' job satisfaction holistically. Furthermore, organizations should remain attentive to dynamic changes in employee job satisfaction and take prompt and effective measures to enhance satisfaction and overall performance.

2.4.3 Determinants of JS

Many complex and intertwined factors influence JS, a pivotal measure of employees' psychological well-being. These factors span individual characteristics, job features, organizational internals, and broader environmental considerations, all converging to shape an employee's overall perception and evaluation of their work.

Firstly, individual characteristics form the foundation of JS. This encompasses personality traits, values, personal capabilities, and interests. For instance, optimistic and outgoing individuals may be more prone to fostering a positive attitude towards their work. At the same time, those seeking self-fulfillment and a sense of accomplishment prioritize jobs that offer sufficient challenges and opportunities for personal growth. Thus, individual characteristics not only mold employees' expectations and needs from their work but also dictate the criteria and feelings they use to assess their job satisfaction.

Secondly, job characteristics profoundly impact JS, mainly reflected in various aspects such as the diversity of job tasks, employee autonomy in work, feedback received, and the meaning of the work itself. The diversity of job tasks is crucial for stimulating employee interest and avoiding monotony at work. When employees can engage in different activities and tackle various problems, their curiosity and desire for exploration are stimulated, making work challenging and fresh and ultimately enhancing JS. Autonomy empowers employees to make independent decisions and manage their work, making them feel valued for their opinions and contributions. This control over the work process can enhance employees' sense of responsibility and belonging, increasing their JS. Timely and accurate feedback is also essential for employees to understand their job performance, adjust strategies, and improve efficiency. When employees regularly receive feedback on their performance, they can better understand their strengths and weaknesses and thus make targeted improvements to their work methods and approaches, enhancing efficiency and satisfaction. Employees also place great emphasis on the meaning and value of their work. When they believe their work can significantly contribute to society or the organization, they feel it is valuable. This perception can significantly enhance their JS.

The concept of JE provides a new perspective for understanding the relationship between job characteristics and JS. JE reflects the closeness between employees and their work environment, including aspects such as the fit between the employee and the organization, their position within the work social network, and the potential costs of leaving the job. When

employees are deeply embedded in their work, they are more likely to experience high levels of JS.

Therefore, the relationship between job characteristics and JS is multidimensional and involves various aspects. These aspects are closely related to the degree of JE experienced by employees. To enhance employee JS, organizations must focus on factors such as the diversity of job tasks, autonomy, feedback, and the meaning and value of the work itself and strive to create a work environment that facilitates deep employee embeddedness.

In addition, multiple organizational factors are indispensable in shaping JS. These include managers' leadership styles, the atmosphere of organizational culture, compensation and benefits systems, and promotion opportunities. A supportive and innovative leadership style can effectively stimulate employees' creativity and enthusiasm for work. Similarly, an open and inclusive organizational culture fosters employees' sense of belonging and identity. Meanwhile, a fair and reasonable compensation and benefits system and ample promotion opportunities are critical for employees when assessing JS.

It is worth emphasizing the profound impact of LMX on JS. LMX theory focuses on the unique relationship established between leaders and team members, and the quality of this relationship directly affects employees' JS and performance. In high-quality LMX relationships, leaders and members have deep trust and respect, and leaders provide more attention, support, and opportunities. This close relationship makes employees feel valued and essential, significantly enhancing their JS. When employees receive recognition and appreciation from their leaders, they become more engaged in their work, are more willing to face challenges, and strive to improve their performance.

Conversely, in low-quality LMX relationships, the connection between leaders and team members is relatively distant and indifferent. This can lead to employees feeling neglected or undervalued, decreasing JS. With the support and attention of leaders, employees may gain motivation, adopt a positive attitude towards work, and even consider leaving the organization. Therefore, building high-quality LMX relationships is crucial for enhancing employees' JS and overall organizational effectiveness.

Lastly, broader environmental factors must be considered. These primarily encompass economic conditions, labor market trends, and sociocultural backgrounds. During economic prosperity, employees may find it easier to secure satisfying jobs and obtain ideal compensation and benefits. Conversely, employees may face increased employment pressure and career uncertainty during economic downturns, subsequently affecting their JS. Simultaneously,

varying sociocultural backgrounds may lead employees to adopt different standards and expectations when evaluating their work.

2.4.4 Outcome variables of JS

JS is a pivotal measure of employees' psychological well-being and a variable that exerts profound influences at both the organizational and individual levels. It is intricately linked to numerous outcome variables critical to employees' career development, quality of life, and the organization's overall performance and long-term growth.

Firstly, there is a notable positive correlation between JS and performance. Satisfied employees tend to hold a more favorable attitude towards their work, are more willing to invest time and effort, and are better equipped to handle challenges and pressures. This positive attitude and enthusiasm can enhance work efficiency and quality, leading to higher performance.

Secondly, JS directly predicts TI. Employee dissatisfaction can foster thoughts of leaving, and prolonged dissatisfaction can lead to a loss of trust and belongingness, prompting employees to seek other opportunities. Therefore, maintaining high JS is crucial for organizational stability and talent retention.

Moreover, JS is closely associated with absenteeism. Satisfied employees are likelier to maintain regular attendance and a positive work attitude, whereas dissatisfied employees are prone to negative behaviors such as absenteeism and tardiness. These behaviors affect individual performance and can adversely affect team collaboration and organizational operations.

Furthermore, there is a positive relationship between JS and organizational commitment. Organizational commitment embodies employees' identification with and dedication to the organization, reflecting loyalty and a sense of belonging. A satisfying work experience helps employees forge deep emotional ties and a sense of responsibility towards the organization, motivating them to contribute more actively to its development.

Lastly, JS positively impacts employees' mental health. Prolonged dissatisfaction can trigger negative emotions such as anxiety and depression, affecting overall well-being. Conversely, satisfying work can bring a sense of accomplishment and fulfillment, improving mental health and quality of life.

In conclusion, JS is a crucial variable with far-reaching impacts on organizational effectiveness and employee welfare. To enhance overall performance and employee happiness, managers should prioritize JS, adopting measures such as optimizing the work environment, providing development opportunities, and fostering employee engagement.

2.4.5 Measurement of JS

Researchers have long been committed to developing various measurement tools for JS to assess employee JS and provide valuable feedback to organizations accurately. These tools vary in design and application, but their common goal is to capture employees' subjective feelings and evaluations of their work.

One of the most used methods for measuring JS is the single overall satisfaction measurement. This method typically evaluates employees' feelings about their jobs through a single question or a brief statement, such as asking, "Are you satisfied with your current job?" or requiring employees to self-rate their satisfaction on a numerical scale. The advantage of this method lies in its simplicity and ease of use (Gaied et al., 2009), allowing for the rapid collection of information on overall JS. However, it may fail to accurately reflect employee satisfaction differences in different job domains or specific aspects.

To comprehensively assess JS, researchers have also developed multidimensional satisfaction scales. These scales include multiple aspects or dimensions to measure employees' satisfaction in different job domains or specific aspects. For example, the Minnesota Satisfaction Questionnaire is a widely used multidimensional satisfaction scale that covers various aspects such as working conditions, compensation, promotion opportunities, and relationships with leaders. Through multidimensional measurement, organizations can obtain more detailed information about which aspects employees are satisfied with and which aspects need improvement.

In addition to the Minnesota Satisfaction Questionnaire, there are other standard JS scales, such as the Job Descriptive Index (JDI) and the Job Satisfaction Survey. These scales may differ in design, but they typically include a series of statements or questions related to work, which employees must evaluate based on their feelings. Organizations can obtain systematic and standardized data using these scales to understand employees' job satisfaction better.

It is important to note that different measurement tools may suit different contexts and purposes. When selecting measurement tools, organizations should consider their applicability, reliability, and validity and choose based on specific research purposes and backgrounds. Furthermore, to ensure the accuracy and reliability of measurement results, organizations should pay attention to issues such as the scientific design of questionnaires, the representativeness of samples, and the standardization of data processing.

2.4.6 Review of JS research

Research on JS not only provides us with an in-depth understanding at the theoretical level but also offers valuable guidance for businesses and organizations in practical applications. Especially in the highly competitive business environment, employee job satisfaction directly relates to organizations' overall productivity and performance. Therefore, optimizing human resource management strategies and enhancing employee job experience and satisfaction have become critical issues for businesses and organizations.

With the acceleration of globalization, research on JS is gradually exhibiting cross-cultural characteristics. More and more scholars are beginning to pay attention to whether there are differences in how employees perceive and interpret JS in different cultural backgrounds. These studies explore how deep-seated factors such as cultural values and social norms influence employees' evaluations of their jobs and further analyze the impact of macro factors such as economic conditions and labor market situations on JS. Through these cross-cultural studies, we can gain a more comprehensive understanding of the multidimensionality and complexity of JS.

In addition, recent research also emphasizes the dynamic nature of JS. Unlike traditional static cross-sectional analyses, modern research increasingly adopts longitudinal designs to capture the trajectory of changes in JS. This research method helps us understand how JS changes over time and in different situations and provides more powerful tools for predicting and intervening in employee job satisfaction.

The relationship between JS and numerous emerging concepts has sparked widespread discussion in the current research landscape. Specifically, how positive psychology elements such as work engagement, psychological capital, and modern work practices such as work-life balance, remote work, and flexible work arrangements are interrelated with JS has become a hot research topic. These studies deepen our understanding of JS and provide creative strategies for businesses and organizations aiming to optimize employee job experience and satisfaction.

In summary, research on JS increasingly demonstrates cross-cultural and dynamic characteristics. Future research will continue to delve into the multidimensionality and complexity of JS and its inherent connections with other important organizational and individual outcomes. Moreover, with the rapid development of technology and continuous innovation in work practices, we have reason to believe that research on JS will provide more effective strategies for businesses and organizations to enhance overall employee job experience and satisfaction.

2.4.7 The relationship between JS and TI

Since March and Simon first proposed the employee turnover model in 1958, the relationship between JS and TI has been a focal point in organizational behavior. March and Simon's model emphasized two core antecedents of voluntary turnover: individuals' perceptions of desirability and ease of mobility. Building upon this foundation, subsequent scholars have further deepened our understanding of this relationship.

In the study by Jackofsky and Peters (1983), the perceived desirability of mobility was essentially equated with JS. This widely accepted perspective has become a fundamental cornerstone for subsequent research. Job satisfaction, the subjective evaluation of employees' overall feelings towards their current job or organization, encompasses various aspects, including job content, work environment, and compensation. When satisfied with these aspects, employees are more likely to feel a sense of belonging and loyalty to the organization, reducing their intention to leave.

JS has gradually emerged as a strong predictor of voluntary turnover. Much empirical research supports the negative correlation between JS and TI (Mobley et al., 1978). This implies that enhancing employee JS effectively reduces turnover rates and enhances organizational stability.

However, it is essential to recognize that the relationship between JS and TI is not absolute. In certain situations, even if employees are satisfied with their current job, they may still have intentions to leave due to external temptations or other personal reasons. Additionally, individual differences may exist in how JS is perceived, and TI is formed. Therefore, in practical applications, it is necessary to consider multiple factors comprehensively to predict and intervene in employee turnover behavior more accurately.

In summary, there is a close association between JS and TI. To enhance organizational stability and employee JS, managers should focus on and strive to improve critical factors that may influence employee satisfaction, such as job content, work environment, and compensation. Additionally, establishing effective communication channels and employee support systems can strengthen employees' sense of identification and belonging to the organization, thereby reducing the occurrence of TI.

Based on the literature review and discussion above, we propose the following hypothesis:

H3: JS is negatively related to TI.

2.4.8 The mediating role of JS between LMX and TI

The LMX theory provides a solid theoretical foundation for understanding the interactive relationships between leaders and organizational members. This theory emphasizes that leaders establish relationships of varying qualities with different members, grounded in material and social exchanges. Leaders categorize members into "in-group" and "out-group " within this exchange dynamic." Members perceived as part of the "in-group" enjoy closer and deeper relationships with the leader, resulting in greater access to organizational resources, promotional opportunities, trust, and respect. This privileged status and treatment often significantly enhance their JS. Conversely, members labeled "out-group" may experience dissatisfaction and frustration due to lacking resources and opportunities.

JS reflects employees' feelings and evaluations of their work environment, content, and outcomes. It plays a crucial bridging role in the relationship between LMX and TI. When employees perceive support, trust, and respect from their leaders, their sense of identification with the organization increases, leading to greater job involvement and, consequently, higher JS. This positive emotional state makes employees more appreciative of their current job opportunities and inclined to stay and continue developing within the organization. Conversely, if the relationship quality between employees and their leaders is higher, they may feel they need to be more valued, leading to decreased JS. In such cases, employees are more likely to develop TI and seek other job opportunities that better meet their needs.

The study by Gerstner and Day (1997) further supports this viewpoint by finding that LMX indirectly influences turnover behavior through its impact on other employee attitudes, such as satisfaction and organizational commitment. This suggests that JS significantly mediates between LMX and TI.

Based on the above literature review and discussion, we propose the following hypothesis:

H4a: JS mediates the relationship between LMX and TI.

2.4.9 The mediating role of JS between JE and TI

Job embeddedness is a construct that describes the degree of an employee's connectedness to their job and organization (T. R. Mitchell, Holtom, Lee, et al., 2001). When employees are deeply embedded in their work, organization, and community, they often experience higher JS. JE implies that employees have established strong ties within their work environment, feel a high fit with the organization and colleagues, and perceive significant sacrifices associated with leaving their current job (Crossley et al., 2007). Such satisfaction, in turn, enhances their loyalty

to the organization and willingness to stay, thereby reducing TI. Conversely, if employees' job embeddedness is low, they may feel dissatisfied with their work, weakening their connection to the organization and increasing the likelihood of turnover.

Moreover, highly embedded employees face higher turnover costs, including searching for a new job, adapting to a new environment, and losing the support of their existing social network. As a result, even in the face of external job opportunities or dissatisfying work conditions, they are more inclined to stay in their current organization (T. W. Lee et al., 2004). Thus, JS is a crucial psychological mechanism linking JE to TI.

Based on the above literature review and discussion, we propose the following hypothesis:

H4b: JS mediates the relationship between JE and TI.

2.5 Career shocks (CS)

Career shocks refer to unexpected events or significant turning points that individuals may suddenly encounter on their career paths. These shocks have a wide range of sources, potentially involving changes in the work environment, obstacles to personal growth, or disruptive transformations within the industry. Such shocks can profoundly impact an individual's career trajectory, psychological state, and work performance. In the face of CS, individuals need to demonstrate strong adaptability and resilience, bravely embrace challenges, and actively explore new opportunities for career development.

2.5.1 The origins of CS

The concept of CS originated from the "Shock" element in the Unfolding Model of Turnover, referring to a significant event or sudden situation that is substantial enough to trigger thoughts of leaving a job (T. W. Lee & Mitchell, 1994). This shock is not merely an external event but also a challenge to the individual's inner sense of professional identity and career plans. To more accurately depict events that are both subjective experiences of individuals and objective occurrences, scholars introduced the concept of "Career Shock."

Traditional career self-management theories are often based on individual self-control models, assuming individuals can fully direct their career trajectories. However, this assumption often needs to be revised. Events beyond an individual's control, such as changes in the economic environment, technological innovations, or corporate restructurings, can profoundly impact one's career path (Bright et al., 2005). As a form of career shocks, these

external events disrupt people's established expectations about career development, forcing individuals to rethink and replan their careers.

With the advancement of theoretical research, scholars have emphasized the importance of considering both expected and unexpected, sudden events when exploring factors that influence career decisions (Cabral & Salomone, 1990). The " career shocks events" proposed by Lee and Mitchell (1994) in the unfolding turnover model concretize this view. Although not all career-related behaviors stem from career shocks events, such events often stimulate deep reflection on one's current career path and may indirectly influence career transition decisions.

Regardless of their predictability or the magnitude of an individual's emotional response, career shocks events always emerge within specific spatiotemporal contexts, significantly influencing how individuals perceive their current professional situation and future direction (Seibert et al., 2016). This influence may manifest as a reevaluation of current work, an adjustment in career goals, or an update and enhancement of professional skills.

Personal career shocks, such as sudden job loss, unexpected promotions, or career transitions, can have crucial impacts on one's career trajectory (Hirschi, 2010). These shock events often disrupt an individual's career equilibrium, forcing them to rethink and adjust their career strategies. Traditionally, career shocks has been viewed as chance occurrences (Miller, 1983), fortunate coincidences (Betsworth & Hansen, 1996), or unexpected situations (Bright et al., 2005). However, the literature on career shocks as a foundation for career management has expanded significantly in recent decades, leading to a growing appreciation and understanding of their role in individual career development.

Despite receiving some attention and research in academic circles, the concept of CS could be more precise, especially when combined with the Chinese context. China's unique cultural background, values, and career development paths may influence the definition and interpretation of CS. Therefore, there is a need to strengthen the understanding and research on the core components of CS to better illustrate, describe, and comprehend their impact on individuals (Ali et al., 2020). This will help provide individuals with more effective career planning and management advice, assisting them in better navigating the various shocks and challenges encountered in their professional journeys.

2.5.2 Definition of CS

The concept of CS originates from the notion of "systemic shocks" in the Unfolding Model of Turnover. Systemic shocks, also known as "shocks," specifically refer to those particular and unsettling events that trigger the psychological decision-making process for individuals

regarding the abandonment of their current job (T. W. Lee et al., 1996). In other words, a shock is an unusual event encountered by individuals in their careers, which profoundly impacts them, leading them to reassess their career choices and contemplate resignation.

The turnover unfolding model divides the employee's decision-making process of leaving into four unique paths, with three of them triggered by systematic shock events. However, it is essential to emphasize that not all events can be classified as shocks. According to T. W. Lee and Mitchell (1994), only those events that provide new information or insights into the meaning of one's work can genuinely be considered shock events. Such events often disrupt an individual's career equilibrium, prompting them to reexamine their career plans and goals.

Chinese scholars have actively conducted relevant research to understand career shocks events' types and impacts further. Feng et al. (2021) suggest that career shocks events are significant occurrences that stimulate individuals to reflect deeply on their current professional situations and potentially change their career decisions. These events have multiple impacts: they may bring positive effects, opening new career opportunities and development spaces for individuals; they may also have negative impacts, causing dissatisfaction or loss of confidence in current work; additionally, they may exhibit neutral effects, meaning the events themselves have no clear positive or negative tendencies but prompt individuals to reevaluate their careers.

In summary, CS, as a crucial professional phenomenon, profoundly influences individuals' career development and decision-making processes. By deeply exploring the concept, types, and impacts of CS, we can better understand individuals' challenges and opportunities and provide them with more effective career planning and guidance suggestions.

2.5.3 Classification of CS events

The classification of CS events exhibits multidimensional characteristics, facilitating a deeper understanding of their nature and consequences from different perspectives. Here are several primary classification methods:

1. Based on event attributes

Shocks can be categorized as positive, neutral, or negative events. Positive events like promotions or awards are typically associated with favorable career developments. Neutral events may not directly involve positive or negative changes in career progression but can trigger individuals to reevaluate their professions. Negative events often entail setbacks, disappointments, or career difficulties, such as unemployment or demotion.

2. Based on event purpose

career shocks events can be divided into personal events external to work (e.g., family changes, health issues), personal events related to work or work roles (e.g., job stress, career burnout), and organizational events (e.g., corporate restructuring, layoffs). These events impact an individual's professional state and can profoundly influence career decisions and planning.

3. Types identified by scholars

When studying career shocks events, scholars have also proposed various types, such as unexpected, family, job, and personal shocks. These classification methods help us to understand more precisely the sources and nature of shock events and their impact on individual career paths.

4. Impact-based classification of career shocks events

According to the effects generated by career shocks events, they can be categorized into two main types: positive and negative. This classification method is widely accepted and commonly used by researchers. PCS events enhance employees' sense of identification and belongingness to their current profession and elevate their status and reputation in the organization and professional field. For instance, sudden promotions or salary increases, receiving outstanding professional awards, and completing essential projects are typical examples of positive shock events. These events bring professional achievements and satisfaction to individuals and may ignite tremendous enthusiasm and career drive. PCS events promote employee recognition of their current profession and consolidate their identity and honor in the organization and professional field, such as sudden promotions or salary increases, receiving prestigious awards in the professional field or within the organization, successfully advancing critical projects, and publishing papers in top-tier academic journals (Burton et al., 2010; Holtom et al., 2005; Kraimer et al., 2019; Seibert et al., 2013). These positive events within the organization can be likened to "golden handcuffs"(Seibert et al., 2016), strengthening their connection with the organization. Additionally, special positive shock events related to job opportunities, such as unexpected job invitations, may inspire employees to explore more career possibilities, potentially leading to thoughts of changing organizations, industries, or positions. Such events are essential in predicting turnover behavior (T. H. Lee et al., 2008).

In contrast, NCS events often trigger dissatisfaction and disappointment among employees with their current profession and may even lead to intentions to resign. These events may include the departure of essential mentors, failure to obtain expected job assignments or promotion opportunities, and receiving unfavorable performance feedback, all of which can negatively impact an individual's career mindset and planning. Negative organizational and

political events and significant changes, such as layoffs, mergers, or ethical scandals, can also affect employees, threatening their career stability and prospects.

Apart from events directly related to work, NCS can also originate from the personal life domain. For example, a spouse's need to relocate due to a new job, divorce, family members falling seriously ill, or passing away can similarly affect an individual's career status and decision-making (Seibert et al., 2016). These events may lead to distractions and insecurity in one's career and may also compel individuals to reevaluate and adjust their career plans and goals.

Categorizing career shocks events helps us better understand their impact and mechanisms on individual career paths. By conducting in-depth research on different types of shock events and their effects, we can provide individuals with more effective career planning and guidance, helping them better cope with the various challenges and opportunities in their career paths (Akkermans et al., 2018; Ali et al., 2020; Kraimer et al., 2019; T. W. Lee et al., 1999; Seibert et al., 2013).

2.5.4 How does CS moderate the relationship between LMX, JE, JS, and TI

As a unique and unsettling event, CS plays a crucial role in employees' consideration of their attachment to work and decisions regarding turnover. It disrupts the equilibrium between the employee and the work environment and triggers various emotional and cognitive responses, influencing the employee's attitude and behavior toward work.

Employees' intention to leave (or stay) is often not isolated but influenced by the surrounding environment or specific events (Maertz & Campion, 2004). Career shock is an event that generates information or provides meaning related to personal work, which employees interpret and integrate into their belief and identity systems. This integration process not only affects employees' cognition and evaluation of work but also has the potential to alter their emotional attachment and behavioral tendencies toward it.

Personal shocks, such as winning the lottery, a spouse's job transfer, losing a loved one, or adopting a baby, can lead to intense emotional fluctuations, creating a solid intention for employees to leave (or choose to stay). These events often disrupt employees' life balance, forcing them to reevaluate their career plans and goals. On the other hand, organizational shocks more directly affect an employee's attachment to the organization, JS, and the quality of their exchange with leadership (LMX). For instance, events like failing to get a promotion, receiving a new job offer, having a dispute with the boss, receiving a significant bonus, or company layoffs can all trigger TI by changing an employee's perceptions and emotional responses

toward the organization. These shock events influence an employee's evaluation of their current job and alter their expectations and plans for future career development. However, it is worth noting that not all shock events lead to TI. According to research on affective events theory, "positive workplace events" may become more deeply embedded in an employee's mind (rather than prompting them to leave) (Judge et al., 2017). These positive events can enhance an employee's attachment to and satisfaction with their job by fostering positive emotions or affective responses, potentially offsetting TI caused by other shock events.

Based on the above literature review and discussion, we propose the following hypotheses:

H5a: CS moderate the relationship between LMX and TI. This relationship is more robust when CS is high compared to low.

H5b: CS moderate the relationship between JE and TI. This relationship is more robust when CS is high compared to low.

H5c: CS moderate the relationship between JS and TI. This relationship is more robust when CS is high compared to low.

2.6 Perceived opportunities (PO)

PO refers to an individual's subjective cognition and assessment of potentially beneficial or detrimental factors in the external environment. It reflects a person's acuity and understanding of opportunities or challenges that may arise in the present and future. In career development and job selection, PO influences an individual's expectations and decisions regarding career paths, job opportunities, and compensation. These serve as a crucial basis for making rational choices and planning.

2.6.1 Definition of PO

PO is a central yet controversial concept in studying career mobility and organizational behavior. Based on their respective research perspectives and theoretical frameworks, scholars have ascribed diverse definitions to PO. Price and Mueller (1986) interpreted it as "perceived alternative job opportunities," emphasizing individuals' cognition of options beyond their current jobs. Farrell and Rusbult (1981), on the other hand, approached it from the quality of job alternatives, suggesting that PO is closely related to the relative attractiveness of current work. Mobley's (1977) definition focused on individuals' mindset and tendency when seeking new employment, described as "the propensity to search for acceptable job alternatives."

Furthermore, Steers et al. (1981) associated PO with "the availability of alternative job opportunities," highlighting individuals' perceptions and assessments of the external job market. Mobley et al. (1978) echoed this sentiment, arguing that PO refers to "the availability of alternatives." These definitions underline individuals' subjective cognition of external choices when evaluating their work environment and future career prospects.

In earlier research, Price and Mueller (1981) also linked PO to "employment opportunities," a definition that more broadly encompasses the state of the entire job market. Meanwhile, Jackofsky and Peters (1983) related PO to the ease of job change from the mobility perspective.

In summary, PO is a multidimensional concept involving individuals' comprehensive assessment of the external job market, alternative job opportunities, and their mobility. In this research, we adopt the definition provided by Wheeler et al. (2005), which defines PO as "the number of alternative job opportunities available to an individual." This definition encapsulates information about the external job market while reflecting individuals' subjective cognition of their career choices. It provides a solid foundation for further exploring the relationship between PO and other organizational behavior variables.

2.6.2 Measurement of PO

In turnover research, perceived alternative opportunities reflect employees' subjective cognition of the external job market and their position. This cognition significantly impacts employees' turnover decisions, making measuring perceived alternative opportunities accurately a focal point for researchers.

Traditional measurement methods primarily employ unidimensional rating scales (Coverdale & Terborg, 1980; Michaels & Spector, 1982; Mobley et al., 1978; Mowday et al., 1984; Prestholdt et al., 1987). These approaches view perceived alternative opportunities as a single-dimensional structure measured through employees' overall assessment of external job opportunities. While these methods are relatively convenient to administer, they also present significant limitations.

The main issue with unidimensional rating scales is that they may need to fully capture the complexity of employees' perceptions of the labor market. Employees’ views of the labor market can vary throughout the years, including the quantity, quality, accessibility, and personal fit of job opportunities. Therefore, single-variable operations may fail to accurately capture these multidimensional variations, thus inadequately reflecting the labor market's influence on turnover decisions.

Stee and Griffeth (1989) proposed a multidimensional model for measuring perceived alternative opportunities to overcome this limitation. They argued that perceived alternative opportunities should encompass six dimensions: the quantity and quality of alternatives, the concreteness of alternatives, the accessibility of alternatives, personal mobility, and personal access to job availability information networks. These dimensions capture different cognitive aspects of employees' perceptions of the external job market, providing a more comprehensive understanding of their views on the labor market.

In this multidimensional model, the quantity and quality of alternatives are the fundamental dimensions, reflecting the abundance and desirability of external job opportunities. The concreteness of alternatives refers to the degree of specific knowledge and awareness employees have of these job opportunities. Accessibility of alternatives concerns the ease with which employees can obtain these job opportunities. Personal mobility relates to an employee's ability to move within the labor market, encompassing skills, experience, and interpersonal relationships. Finally, personal access to job availability information networks refers to the channels and networks through which employees obtain job information.

By measuring these multiple dimensions, we can more accurately understand employees' perceptions of the external job market, leading to more precise predictions of their turnover decisions. This is significant for organizations because by understanding employees' willingness to leave and their reasons for doing so, organizations can take appropriate measures to retain talent or improve human resource management strategies.

2.6.3 Research review on PO

Since March and Simon first proposed the employee turnover model in 1958, PO has been an indispensable factor in the decision-making process of turnover. They believed that employee turnover decisions are based on a comprehensive assessment of the desirability and feasibility of mobility. Among them, PO, which refers to employees' cognition and evaluation of external job opportunities, is a crucial factor affecting turnover decisions.

Griffeth et al. (2005) further emphasized the importance of perceived alternative opportunities in subsequent studies, considering it as one of the core assumptions of turnover theory. Traditionally, it has been thought that employees evaluate external job opportunities and seek possible alternatives before considering leaving their current job. The likelihood of an employee leaving decreases significantly when suitable alternative job opportunities are unavailable. However, with the changing times and shifts in workplace attitudes, the newer generation of young people, such as millennials, may exhibit different behavioral patterns in

their decisions to leave. They may be more inclined to quit without considering the consequences, a phenomenon known as "quitting bare" (bare quitting). This necessitates reevaluating the role of perceived alternative opportunities in the turnover decisions of the new generation of employees.

In studies on the impact of perceived alternative opportunities on turnover decisions, scholars have put forth different perspectives. Hom et al. (1984) argue that perceived alternative opportunities primarily influence employees' search behavior, precisely their enthusiasm and effort in seeking new job opportunities. On the other hand, Mobley et al. (1978) further expand on this viewpoint, suggesting that perceived alternative opportunities affect search behavior and directly influence employees' willingness to leave. This implies that when employees perceive an abundance of suitable job opportunities externally, they become more proactive in seeking new employment and strengthen their intention to leave.

In summary, as an essential factor in the turnover decision-making process, PO may vary in influencing mechanisms with changes in time and demographics. To gain a deeper understanding of the turnover behavior of the new generation of employees, further exploration of the specific impact and mechanisms of perceived alternative opportunities on turnover decisions in the context of the new era is warranted.

2.6.4 How PO moderate the relationship between LMX, JE, JS, and TI

As a critical variable, PO reflects employees' assessments of the external job market and reveals how they weigh current work conditions against external opportunities when considering turnover.

Firstly, in environments of high unemployment, employees often reassess the risks and costs associated with leaving their jobs. Research by Hom and Kinicki (2001) and T. W. Lee and Mitchell (1994) indicates that high unemployment effectively discourages employees from translating TI into actual actions. This is because, when the job market is unfavorable, employees recognize the lower likelihood of finding new employment, leading them to value their current positions more, even if there are aspects, they find unsatisfactory.

Schneider's (1976) study further emphasizes the importance of perceived alternatives in predicting and understanding TI. Indeed, when employees perceive better job opportunities externally, they are more likely to consider leaving. However, if these alternatives are less clear or easily accessible, employees may reconsider leaving.

Research by Dansereau et al. (1974) demonstrates the role of PO in moderating the relationship between job attitudes and turnover rates. Their study suggests that employees may

be more cautious about leaving when they believe their employment opportunities in the current job market are limited. This is because they recognize that turnover may carry more significant risks and uncertainties in a scarce job market.

Hom et al.'s (1992) research reveals a significant finding: labor market conditions notably moderate the relationship between job dissatisfaction and voluntary turnover. When the labor market is tight, the push effect of job dissatisfaction on turnover is weakened. This is because employees know that choosing to leave under such circumstances could hinder their career progression and make it difficult to find new job opportunities. Conversely, in environments with lower unemployment rates, JS has a more prominent influence on turnover decisions (Gerhart, 1987; Youngblood et al., 1985).

Through empirical research, Wheeler et al. (2007) further validated the moderating role of PO in the relationship between employee JS and TI. The study found that when employees are dissatisfied with their jobs, their intention to leave may increase if they perceive better career opportunities externally. However, if they perceive a sluggish external job market with limited employment opportunities, they may choose to remain in their current positions despite these roles not fully meeting their expectations.

PO also plays a crucial moderating role when communication quality between employees and leaders is poor. Employees who feel that their current organization is not conducive to their growth may develop intentions to leave. However, the level of these intentions is influenced by PO. If the job market is favorable and employees perceive better job opportunities externally, their intention to leave may strengthen. Conversely, suppose the job market is tough, and employees perceive fewer external employment opportunities. In that case, their intention to leave may weaken because they realize that leaving under current circumstances could entail more significant risks and uncertainties.

Based on the literature review and discussion above, we can propose the following hypotheses:

H6a: PO moderate the relationship between LMX and TI, which is more robust when PO is higher than low.

H6b: PO moderate the relationship between JE and TI, which is more robust when PO is higher than low.

H6c: PO moderate the relationship between JS and TI, which is more robust when PO is higher than low.

Employees gradually adapt to the work environment and become familiar with work tasks as time passes. However, the accompanying work pressure, various changes in the work

environment, gaps in work expectations, career development space, and promotion opportunities can all cause employee job satisfaction fluctuations. Employees feeling disappointed and dissatisfied further enhances their willingness to leave. Based on the above research hypotheses, the research model of this study is shown in Figure 2.1.

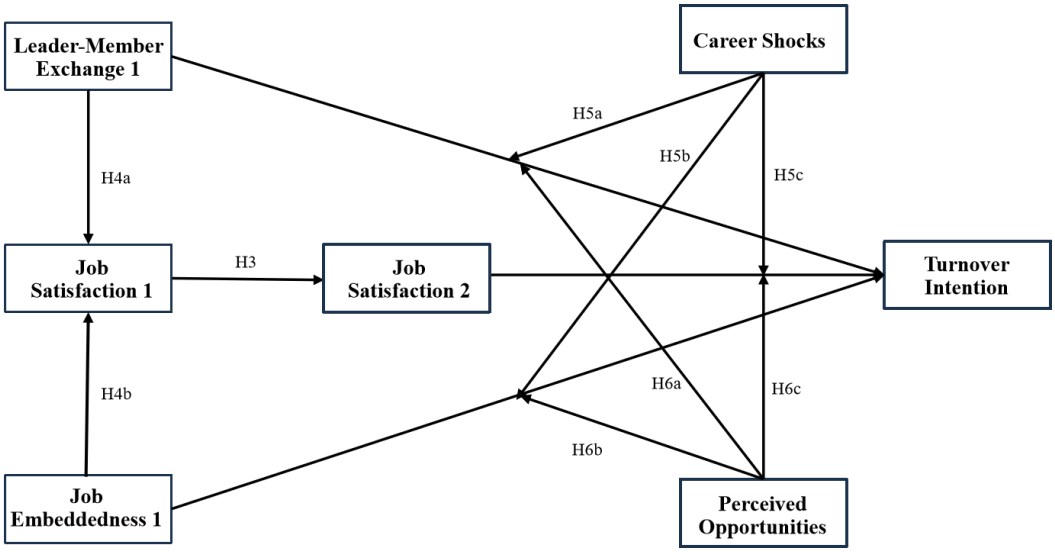

Figure 2.1 Research model

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Chapter 3: Research Methods

This chapter describes in detail the research methods adopted in this study, including the specific content of research links such as questionnaire design, variable measurement, data collection, and data analysis.

3.1 Research questionnaire design

This study employs a quantitative analysis approach to delve deeply into the predictive effects of LMX and JE on the TI among medical staff in public hospitals in Guangzhou City. To achieve this objective, we have meticulously crafted a scientific and systematic questionnaire to collect relevant data comprehensively and accurately. The questionnaire content tightly revolves around the core constructs of LMX, JE, and TI, ensuring precise capturing of medical staff's actual situations and feelings in these aspects.

We have adhered to scientific rigor and standardization principles throughout the questionnaire design process. Firstly, based on the central purpose of the study and drawing from extensive literature, we constructed a clear and specific theoretical framework and research hypotheses, laying a solid theoretical foundation for the questionnaire design. Secondly, regarding the specific content of the questionnaire, we strive for concise language and unambiguous phrasing to ensure respondents can quickly and accurately grasp the essence of the questions and provide corresponding answers. Simultaneously, we pay special attention to the questionnaire's structural arrangement and logical sequence, employing a reasonable layout and order design to make each section interconnected and mutually supportive, forming a complete and coherent whole.

To further enhance the quality and reliability of the data, we have implemented several strict control measures. On the one hand, by setting screening questions, we ensure that only respondents meeting the research criteria can participate in the survey, thus eliminating the influence of unqualified samples on the research results. On the other hand, we also conducted a pre-test of the questionnaire, inviting some medical staff to complete it and make detailed adjustments and improvements based on their feedback. These measures effectively improve the accuracy and credibility of the data.

Through these efforts, we anticipate obtaining accurate and reliable research results that provide robust data support for understanding the TI among medical staff. Meanwhile, this study will offer hospital administrators deeper insights into the TI of medical staff, assisting them in developing more effective human resource management strategies to enhance staff satisfaction and retention, promoting hospital stability and development.

3.1.1 Questionnaire design approach

When designing the questionnaire for this study, we comprehensively considered the core objectives of the survey, the target population, and the survey methods employed to ensure that the questionnaire could accurately and efficiently collect the required data. Based on an in-depth literature review, according to the research model, we identified the key variables to be measured in this study, including LMX, JE, JS, CS, PO, and TI.

Firstly, regarding the content design of the questionnaire, we prioritized the adoption of authoritative scales that have been empirically validated and widely recognized in China. These scales have established reliability and validity in related fields, providing reliable measurement tools. To ensure the adaptability and relevance of the questionnaire, we carefully screened and refined the questionnaire items through expert group discussions. The valuable input from experts helped us optimize the overall structure of the questionnaire, making it more aligned with the characteristics and needs of the target population, thereby improving its readability and comprehensibility.

Secondly, in terms of the format design of the questionnaire, we emphasized simplicity and intuitiveness. We simplified the structure and questioning style of the questionnaire as much as possible, avoided lengthy and complicated questions, and ensured that respondents could quickly understand the content and provide responses. Additionally, we used clear and understandable language to phrase the questions, avoided overly technical or obscure terminology, and guaranteed that respondents could accurately comprehend the meaning of the questions and provide genuine answers. These measures improved the efficiency of completing the questionnaire and reduced errors and biases during data collection.

Moreover, we paid particular attention to the respondents' informed consent and willingness to participate. To ensure that respondents voluntarily participated in the survey based on a thorough understanding of the research situation, we designed an informed consent form that informed respondents of the purpose, significance, risks, and rights and obligations related to the study. This approach not only enhanced the ethical standards of the research but also boosted respondents' trust and willingness to participate.

In the final stage of questionnaire design, we conducted a small-scale pre-test of the questionnaire, considering the actual situation of medical staff in public hospitals. Analyzing the pre-test data and collecting feedback from respondents, we promptly identified and corrected issues and deficiencies in the questionnaire, further improving its scientific rigor and practicality. After repeated revisions and improvements, the final formal questionnaire not only closely aligned with the needs and characteristics of this study but also demonstrated high levels of reliability and validity.

Based on these principles and design approaches, we conducted a literature review and analysis focusing on the six variables measured in this study. By referring to widely used and repeatedly validated scales in similar fields, we selected measurement tools that exhibit good scientific rigor and rationality, providing reliable data support and an analytical basis for our study.

3.1.2 Questionnaire design process

At the inception of the questionnaire design, we identified the core measurement variables for this study based on extensive literature reviews and a carefully constructed research model. These variables included LMX, JE JS, CS, PO, and TI. The selection of these variables aimed to explore the research topic and provide a solid foundation for our subsequent data analysis comprehensively and deeply.

We adhered to a series of principles to ensure the scientific validity and effectiveness of the questionnaire design. Firstly, we delved deeper into the literature, conducting a more detailed review of studies related to the variables above. This step aimed to identify previously validated measurement items with high reliability and validity. We paid particular attention to items that had been widely used and repeatedly empirically tested to ensure the scientific reliability of our measurement tools. Simultaneously, to fully reflect the connotations of each variable, we decided to measure them using multiple items, thereby enhancing the richness and accuracy of the data.

Based on the literature review, we developed the initial draft of the questionnaire. However, rather than rushing to finalize it, we actively solicited feedback from experts in various fields to ensure its applicability and respondent-friendliness. We invited two medical professionals with rich practical experience, two experts in healthcare management, and one expert in human resource management to review the initial draft of the survey questionnaire. During the expert consultation process, we focused on assessing whether the questionnaire items were worded, whether there were any ambiguities or difficult-to-understand situations, and whether the

overall design of the questionnaire was reasonable and easy for respondents to complete. The experts provided invaluable feedback, pointing out issues such as unclear wording of certain items and the need for adjustment in the order of some questions. In response to their suggestions, we modified and adjusted the questionnaire items.

Furthermore, we paid particular attention to the layout and formatting of the questionnaire. We ensured that the font size was moderate and the line spacing was appropriate for respondents to read easily. Additionally, we carefully arranged the order and layout of the questions to present a neat and organized appearance for the entire questionnaire. After incorporating all these efforts, we finalized the pre-test survey questionnaire for this study.

3.1.3 Questionnaire structure

The survey questionnaire for this study comprises several key components, including an informed consent form, an introduction, basic information, and variable measurement scales.

3.1.3.1 Informed consent form

The Informed Consent Form serves as a crucial document that verifies the voluntary participation of respondents in this study. It details all relevant aspects of the research, ensuring that respondents make an autonomous and informed decision to participate based on a thorough understanding of the study's background.

Firstly, the core purpose of the study is clearly outlined in the Informed Consent Form: to collect data systematically and comprehensively from medical professionals regarding their work experiences and influencing factors and to analyze the underlying mechanisms deeply. This data will not only aid in accurately understanding the work status and needs of medical professionals but will also provide valuable support for hospital human resource management. It will facilitate the development of more precise and effective management strategies to optimize the work environment for medical professionals, enhancing their JS and overall efficiency.

Secondly, recognizing the significance of personal information, the potential risks faced by respondents are fully disclosed in the Informed Consent Form, along with the corresponding countermeasures taken by the researchers. It is emphasized that the survey will be conducted anonymously throughout to ensure strict protection of respondents' personal information. Furthermore, the researchers solemnly promise that all collected data will be used exclusively for academic research. Strict data encryption and storage measures will be implemented to prevent data breaches or misuse.

Additionally, the Informed Consent Form places particular emphasis on protecting the rights and interests of respondents. It is explicitly stated that there are no standard answers to any of the questions in the survey, and respondents are encouraged to make choices based on their actual feelings and experiences. Respondents also reserve the right to withdraw from the study and refuse to answer any questions they are unwilling to address. The researchers adhere strictly to legal and ethical guidelines to protect respondents' legitimate rights, interests, and privacy.

Finally, respondents are provided with a detailed overview of the expected outcomes of the study and the potential benefits they may derive from it. Upon completion of the study, respondents will have the opportunity to receive relevant research results free of charge. These outcomes not only offer respondents a deeper understanding of medical professionals' work experiences and influencing factors, providing valuable reference information, but may also positively impact their personal development and career planning. By participating in this study, respondents contribute to improving the work environment for medical professionals and gain invaluable opportunities for personal growth and development.

3.1.3.2 Preface

As the core information of this study, including the research objectives, risk assessments, and participants' rights, has already been fully disclosed and explained to the respondents through the Informed Consent Form, we have decided to avoid repeating such details in the introductory section of the questionnaire. This is to ensure clarity and convenience for the respondents.

Instead, we focus on clearly communicating to the respondents the approximate time required to complete the questionnaire. This allows them to manage their time effectively and decide whether to continue participating based on understanding the time investment involved.

Furthermore, we would like to express our sincerest gratitude to every respondent who is willing to spare their valuable time to participate in this survey. Their active involvement tremendously supports our research efforts and is indispensable in advancing science and contributing to societal development.

We genuinely hope that through this questionnaire, we can gather rich and authentic data that will support our research. We aim to bring more benefits and value to humanity through the findings of this study.

3.1.3.3 Basic information

Based on a comprehensive literature review, this study systematically collected basic information from respondents, covering key aspects such as gender, age, marital status, number of children, education level, work experience, department, contract type, professional title, and years of service in the current hospital. This information is crucial for understanding the individual differences among respondents and provides a solid foundation for subsequent data analysis and interpretation of results.

Specifically, demographic characteristics such as gender, age, marital status, and number of children reveal respondents' essential life circumstances and social roles, contributing to a comprehensive understanding of their profiles. Education level and work experience are critical indicators for assessing respondents' professional capabilities and occupational experience, essential for comprehending their needs and workplace performance.

Meanwhile, information regarding respondents' departments and contract types reflects their positioning and job nature within the hospital organization, providing valuable insights for researchers to delve deeper into their work environments and career development paths. Professional titles and years of service in the current hospital further illustrate respondents' status and loyalty within their professional fields. These serve as significant references for evaluating their job stability and career satisfaction.

By comprehensively collecting this basic information, researchers can more accurately grasp the background characteristics of respondents, thereby adequately considering individual differences when analyzing data. This approach facilitates comparisons and analyses between study findings and specific population characteristics, exploring differences and commonalities among diverse groups and ensuring the validity and generalizability of research outcomes. Through in-depth analysis of respondents' basic information, researchers can more precisely interpret the reasons underlying study results, avoid misinterpretations or overgeneralizations of data, and provide a solid basis for extrapolating findings to broader populations or specific background groups. Ultimately, this enhances the reliability and applicability of the research. Detailed descriptions are as follows.

1. Gender: ① Male ② Female

2. Age: ① 29 or below ② 30-39years ③ 40-49years ④ 50 or above

3. Marital status: ① married ② Unmarried ③ Others (e.g. divorce)

4. Education background: ① College or below ② Bachelor ③ Master ④ Doctor

5. Personnel type: ① Doctor ② Nurse

6. Professional title: ① Primary ② Intermediate ③ Vice senior ④ Senior

7. Post: ① Middle-level manager or above ② General professional technician

8. Length of service:

① 5 years or below ② 6-15 years ③ 16-25 years ④26 years or above

9. Worked in this hospital:

① 5 years or below ② 6-15 years ③16-25 years ④ 26 years or above

10. Number of children: ① 0 ② 1 ③ 2 ④ More than 2

11. Contract types: ① Regular ② Outsourced

12. Monthly income:

① Less than 10000 ② 10001-20000 ③ 20001-30000 ④ Above 30000

3.1.3.4 Questions on variable measurement scales

In the variable measurement section, we focus on quantitatively evaluating and examining each variable within the model. To ensure the accuracy and authority of our measurements, we have adopted empirically validated and authoritative scales in China as our reference. For the design of each item, we will provide detailed and in-depth explanations in subsequent chapters, aiming to ensure that readers fully understand our design rationale and the rationality of our scale selections.

3.1.4 Variable measurement method

The "Likert Scale" is a ubiquitous measurement tool in survey research, possessing widespread application and significant importance. This scale is primarily utilized to assess individuals' levels of agreement with specific viewpoints, attitudes, or feelings. Through a series of declarative items, respondents are asked to select from pre-set scoring options based on their perspectives or emotions.

The Likert Scale comes in various levels, such as 3-point, 4-point, 5-point, 7-point, and 9-point scales, among which the 5-point scale is prevalent due to its simplicity and clarity. It effectively reduces respondents' confusion and hesitation in choosing, minimizes vague responses, and thus enhances the accuracy and reliability of measurements.

Given these advantages, this study employs the Likert 5-point scale as the primary measurement tool. This scale comprises five options ranging from "Strongly Disagree" to "Strongly Agree," corresponding to a scoring range of 1 to 5. This numerical scoring approach facilitates in-depth statistical analysis and comparisons of collected data. Key statistical

indicators such as mean scores and standard deviations can be calculated, further quantifying analysis results and differences among various groups.

Moreover, the Likert Scale has undergone prolonged application and validation, establishing high standards of reliability and validity. It is recognized as a standardized measurement tool, contributing to the comparability and reproducibility of research findings.

3.2 Measuring variables

The precision and validity of measured variables are crucial to ensuring the scientific rigor and accuracy of research conclusions. Adhering to strict scientific standards, we have employed authoritative scales that have undergone extensive empirical testing in China to measure all relevant variables comprehensively and meticulously. Recognizing the uniqueness of public hospital medical staff and the specific research requirements, we have carefully adapted questionnaire items about the study population to enhance their relevance and practicality. We have strictly followed established questionnaire design principles for other items, ensuring measurement stability and reliability.

Based on an in-depth literature review and the theoretical model constructed for this study, we have identified critical variables for measurement. These variables encompass six significant aspects: LMX, JE, JS, CS, PO, and TI. These variables reflect medical staff's psychological states and behavioral tendencies in their work and provide powerful analytical tools for our in-depth exploration of human resource management in public hospitals.

In the following sections, we will provide detailed explanations and elaborations on these critical variables to offer readers a clear and comprehensive understanding. Through an in-depth examination of their connotations, measurement methods, and influencing factors, we hope to provide valuable references and insights for public hospital administrators and relevant researchers, jointly advancing the theory and practice of human resource management in public hospitals.

3.2.1 Measurement of TI

This study adopts the classic definition of TI proposed by Mobley et al. (1978), which views TI as a comprehensive manifestation of job dissatisfaction, the emergence of thoughts of leaving, the tendency to seek other jobs, and the assessment of the possibility of finding alternative employment.

Regarding the selection of measurement scales, we have chosen the TI scale, revised and translated by Weng and Xi (2010) from the original scale developed by Mobley et al. (1979). This scale comprises four core items, specifically:

1. I basically never thought of leaving the current unit.

2. I plan to have a long-term career development in this unit.

3. I often feel tired of my current work and want to change to a new unit.

4. I will probably leave my current unit in the next six months.

In terms of scoring, this scale employs the Likert 5-point rating system, ranging from 1 (strongly disagree) to 5 (strongly agree), to evaluate these items. The overall TI is reflected by calculating the average score of these four items, with higher scores indicating a stronger intention to leave among respondents.

Regarding the reliability of this scale, Weng and Xi (2010) conducted extensive survey validation involving 10 to 25 enterprises in nine cities in China. The validation results showed a Cronbach's α coefficient of 0.755, demonstrating the scale's good internal consistency and reliability in measuring TI. This provides a reliable measurement tool for the present study.

3.2.2 Measurement of LMX

LMX describes the perceived support, understanding, and trust that employees receive from their leaders, as well as the strong bond established between them (Green et al., 1996; H. Wang et al., 2005). When this exchange relationship is more profound, employees often feel part of the leader's "inner circle."

For this study, we have selected the LMX scale translated by Zhao et al. (2014) from the version developed by Wang et al. (2005). This scale comprises seven core items, specifically:

1. Generally speaking, I know very well whether my supervisor is satisfied with my job performance.

2. I think my supervisor is very aware of my problems and needs in my work.

3. I think my supervisor knows a lot about my potential.

4. My supervisor will use his authority to help me solve major work problems.

5. My supervisor will sacrifice my own interests to help me get out of the difficulties at work.

6. I trust my supervisor and support his decision-making.

7. I have a very good working relationship with my supervisor.

In terms of scoring, this scale employs a Likert 5-point rating system, ranging from "1" (strongly disagree) to "5" (strongly agree), to evaluate these items. The overall Leader-Member

Exchange relationship is calculated by averaging the scores of all items, with higher scores indicating a closer relationship between the respondent and their leader.

Regarding the reliability of this scale, in the study conducted by Zhao et al. (2014), the Cronbach's α coefficient of the scale reached 0.92. This value demonstrates excellent internal consistency and reliability of the scale in measuring Leader-Member Exchange, providing accurate and reliable data for this study (Green et al., 1996; H. Wang et al., 2005).

3.2.3 Measurement of JE

Job embeddedness is a concept centered on individual employees, emphasizing the attachment relationship between employees and the organization. This relationship encompasses three dimensions: fit, links, and sacrifice, while the degree of JE is used to explain the various non-emotional considerations that lead employees to choose to remain in their current organization. In assessing JE for this study, we have adopted the Job Embeddedness Scale developed by Crossley et al. (2007) and validated and translated by S. M. Li and Zhao (2017). This scale comprises seven core items, specifically:

1. I feel attached to this organization.
2. It would be difficult for me to leave this organization.
3. I am too caught up in this organization to leave.
4. I feel tied to this organization.
5. I simply could not leave the organization that I work for.
6. It would be easy for me to leave this organization.
7. I am tightly connected to this organization.

In terms of scoring, the scale employs a Likert 5-point rating system, ranging from 1 (strongly disagree) to 5 (strongly agree), to evaluate these items. The overall JE is calculated by averaging the scores of these items, with higher scores indicating a deeper level of JE among respondents.

Regarding the scale's reliability, in the study conducted by S. M. Li and Zhao (2017), the Cronbach's α coefficient of the scale was 0.862, demonstrating good internal consistency and reliability in measuring JE. However, considering the potential issue with the sixth item mentioned above, future researchers may need to revise or improve the scale accordingly when adopting it.

3.2.4 Measurement of JS

In the context of this study, JS refers explicitly to the subjective feelings of senior medical professionals during their tenure and their emotional responses to other job-related factors.

To quantify and assess JS, this study employed the overall Employee Satisfaction Scale developed by Li C. P. et al. (2006), translated from Tsui et al. (1992). This scale comprises six core items, specifically:

1. I am very satisfied with the opportunities for promotion within the unit.
2. I am very satisfied with my colleagues in the unit.
3. I am very satisfied with my immediate supervisor.
4. I am very satisfied with the work itself that I am doing.
5. I am very satisfied with the remuneration I receive from my unit.
6. Overall, I am very satisfied with my current job.

Regarding the scoring method, the scale utilizes a Likert 5-point scoring system, ranging from "1" to "5" to rate these items (where "1" represents strongly disagree, and "5" means strongly agree). The overall JS is then obtained by calculating the average score of all items. A higher score indicates higher JS among respondents.

Regarding the scale's reliability, in the study by Li C. P. et al. (2006), Cronbach's α coefficient of the scale was 0.75. This result indicates that the scale has good internal consistency and reliability in measuring JS, making it suitable for measuring JS in this study.

3.2.5 Measurement of CS

Career shock events refer to significant occurrences that trigger individuals to reflect deeply on their current career status, potentially leading to changes in their career decision-making. The impact of these events can be positive, negative, or neutral (Feng et al., 2021). To measure career shocks, this study adopts the career shock events scale developed by Ali et al. (2020) specifically for the Chinese context.

The scale divides career shocks events into two main categories: positive career shocks (PSC) and negative career shocks (NSC), comprising nine items. The specific items are as follows:

1. I unexpectedly received a new job offer.
2. I was promoted sooner than expected.
3. I was unexpectedly selected for the best performance award.
4. I was unexpectedly selected for an advanced training program.

5. I unexpectedly received a salary increase.

6. Unexpected forced job rotation adversely affected my social relations and behavior.

7. Unexpected downsizing adversely affected my career path.

8. Clash with supervisor/coworker negatively influenced my career planning.

9. The unexpected departure of a mentor or colleague placed me in trouble to sustain my career.

In terms of scoring, this scale uses a Likert 5-point rating system, ranging from "1" to "5" to evaluate these items (where "1" represents strong disagreement and "5" represents strong agreement). This approach allows a quantitative assessment of respondents' feelings regarding career shocks events.

Regarding the reliability of the scale, in the study conducted by Ali et al. (2020), the Cronbach's α coefficient for the positive career shocks events (PSC) subscale was 0.92, and the Cronbach's α coefficient for the negative career shocks events (NSC) subscale was 0.94. These results indicate good internal consistency and reliability in measuring career shocks events, making the scale well-suited for this study.

3.2.6 Measurement of PO

Perceived opportunities refer to an individual's assessment of alternative job opportunities (Wheeler et al., 2005). In this study, we adopted and appropriately revised the scale developed by Weng and Xi in 2010, which was based on research by McAllister (1995), Wheeler et al. (2007), Rusbult and Farrell (1983), and Hui et al. (1999). This revised scale is used to measure PO. The scale comprises the following four items:

1. It is not difficult for me to leave this unit to find a job like this again.

2. I think there are many development opportunities outside the organization.

3. With my current skills and conditions, it is easy to find a satisfactory job again.

4. Leaving the current unit, I have a lot of other jobs to choose from for scoring; this scale employs a Likert 5-point system, where respondents indicate their level of agreement with each item on a scale from 1 to 5 (with one representing "strongly disagree" and five representing "strongly agree"). The overall assessment of available alternative job opportunities is derived by calculating the average score across these four items. A higher score indicates that the respondent perceives a more significant number of available alternative job opportunities.

Regarding the scale's reliability, in the study conducted by Weng and Xi (2010), the Cronbach's α coefficient for this scale was 0.747. This suggests good internal consistency and reliability in measuring PO, making it suitable for the present study.

3.3 Principles of questionnaire distribution

Ensuring the scientific distribution of questionnaires is crucial in guaranteeing this study's smooth progress and credible results. By adhering to standardized distribution procedures, we can not only enhance the rigor of the research but also ensure that the final collected data is highly reliable and valid.

3.3.1 Selection of research participants

The core objective of this study is to investigate the predictive effects of LMX relationships and JE on TI among healthcare professionals in tertiary public hospitals in Guangzhou, China.

As a significant city in southern China, Guangzhou comprises 11 administrative districts, divided explicitly into four central urban areas (Yuexiu, Liwan, Haizhu, and Tianhe) and seven suburban districts (Baiyun, Panyu, Nansha, Huangpu, Conghua, Zengcheng, and Huadu). According to the official website of the Guangzhou Health Commission, as of April 26, 2023, there are 20 municipal tertiary public hospitals in Guangzhou, including 11 general hospitals and nine specialized hospitals.

To ensure the breadth and depth of the research, this study deliberately selected seven general hospitals and five specialized hospitals from the municipal tertiary public hospitals in Guangzhou as sample sources. These hospitals are geographically distributed across Yuexiu District (4 hospitals), Liwan District (3 hospitals), Haizhu District (2 hospitals), and one hospital each in Tianhe, Huangpu, and Zengcheng districts. Together, these hospitals have 20,632 beds and employ 23,501 health technicians.

In each selected hospital, researchers randomly chose no less than 40 doctors and nurses from clinical departments strictly according to preset criteria as survey respondents. A total of 500 respondents were selected from 12 hospitals to ensure the diversity and representativeness of the sample, thereby meeting the requirements of statistical analysis.

3.3.2 Questionnaire distribution method

The present survey employed electronic questionnaires, ensuring participants' anonymity during the completion process. Before commencing the questionnaire, a comprehensive informed consent form was provided to each participant. This form explicitly stated that the sole purpose of the survey was for academic research and solemnly promised that the collected data would be strictly confidential, with no public disclosure in any form. Fully aware of the

importance of personal information, we guarantee that no personal details will be leaked. This approach aimed to alleviate any potential doubts or concerns participants may have had, ensuring their participation was voluntary. Only when participants fully understand the research objectives and expressly consent can the collected sample data reflect their thoughts and situations, guaranteeing data quality and the accuracy of research findings. Consequently, participants were only invited to complete the questionnaire after explicitly consenting.

3.3.3 Number of valid questionnaires

Different statistical analysis methods have varying requirements for sample size. To ensure the stability and validity of the obtained parameters, the sample size must meet a certain standard. Conversely, an insufficient sample size may lead to model convergence failures, inappropriate parameter values, and inaccurate estimation of standard errors. This issue has garnered widespread attention in the academic community, with numerous scholars offering their perspectives.

Nunnally and Bernstein (1968) suggest that the sample size should be at least ten times the number of variables, denoted as $N/V \geq 10$ (where N represents the sample size and V represents the number of variables).

Tanaka (1987) and Bollen (1989) argue that the sample size should be at least ten times the number of free parameters, expressed as $N/P \geq 10$ (where N is the sample size and P is the number of free parameters).

Bentler and Chou (1987) further note that under conditions of normally distributed data, without missing values or extreme outliers, the sample size should be at least five times the number of free parameters. If these conditions are unmet, the sample size should be increased to 15 times.

Boomsma (1987) emphasizes that when using the maximum likelihood method for estimation, a minimum sample size of 200 is required. A sample size of less than 100 may lead to erroneous conclusions.

Regarding factor models, Loehlin (1986) proposes that a model with 2 to 4 factors requires a minimum of 100 samples, with more than 200 being ideal. M. Mitchell (1993) suggests that the sample size should be at least 10 to 20 times the number of variables in the model.

Ding, Velicer, and Harlow (1995) synthesized research from various scholars and suggested that a sample size of at least 100 to 150 is required for Structural Equation Modeling (SEM) analysis. Velice and Fava (1998) found that sample size plays a crucial role in exploratory factor analysis; hence, it is also a critical factor in SEM. For most SEM applications,

a sample size of over 200 is considered more appropriate. This view is supported by Kling (1998), who argued that the minimum sample size for SEM should be 100; otherwise, the model estimation results would be unstable and unreliable.

Jackson (2003) further pointed out that when using the maximum likelihood method for estimation, the ratio of estimated parameters to the sample size should be 1:20, with 1:10 being the minimum requirement. After investigating many SEM studies, Schumacker and Lomax (2004) concluded that a sample size range of 250 to 500 is more suitable.

Barrett (2007) emphasized that parameters estimated from SEM models with a sample size below 200 are unreliable. It is worth noting that when using AMOS software for parameter estimation (which typically employs the default maximum likelihood method), a sample size greater than 500 may lead to severe chi-square inflation, increasing the risk of the model being rejected as the p-value is more likely to be less than 0.05.

Synthesizing the recommendations of these scholars, for most structural equation models, a sample size range of 100 to 500 is ideal. In this study, conducted at a tertiary public hospital in Guangzhou through a questionnaire survey, 500 questionnaires were initially distributed, and 500 valid questionnaires were recovered. After excluding 18 unqualified questionnaires, 482 valid questionnaires remained. This sample size ensures the scientific rigor and validity of the research results.

3.3.4 Quality control

To ensure the study's rigor and data quality, we carefully recruited two research assistants with master's degrees or above who received systematic training in research methods. We provided these assistants with specialized training for the questionnaire collection process to familiarize them with relevant procedures and requirements. In designing the questionnaire, we specifically included contact phone numbers for the research team in the instructions to enable respondents to obtain timely answers to any queries. This measure aimed to improve the accuracy and completeness of questionnaire responses.

Before implementing the survey, the research assistants prepared an electronic version of the scale using a professional online survey website (https://www.wjx.cn) and generated a corresponding QR code. Respondents could easily access and complete the online questionnaire by scanning the QR code. Upon completion, the data would automatically be saved and uploaded to the website server for subsequent data analysis and processing.

To further enhance the quality of the electronic questionnaire, we conducted a strict review of its content. During the preparation process, we added a prompt function that prevented

respondents from submitting incomplete questionnaires due to missed items. Additionally, we established uniform "content format" and "word limit" standards for open-ended questions to standardize respondents' answers and ensure that the collected information met research requirements.

After compiling the electronic questionnaire, the research assistants conducted test fills using different mobile devices at various times. We officially released the questionnaire after repeated verification and confirmation that the filling process was smooth and compliant with standard requirements. These measures ensured that the questionnaire setup met expected standards and that the data could be effectively uploaded to the server for subsequent processing.

3.4 Ethical review

Before commencing this study, we submitted a relevant application to the Second Affiliated Hospital Ethics Committee of Guangzhou Medical University and were honored to receive their formal approval (Approval Number: 2023-ks-07). This study has always adhered to ethical principles and strictly followed the requirements of ethical review to ensure that the rights and interests of every respondent are fully protected. We deeply understand that ethical review is not only a guarantee for the legality and compliance of research but also a respect for the dignity and rights of participants. Therefore, we will spare no effort to uphold the research's legitimacy, morality, and reliability and resolutely defend respondents' privacy and various rights and interests from infringement.

3.5 Data collection

A time-lagged survey design was employed to minimize potential standard method bias (CMB) issues and enhance the strength of the study's causal inference. Specifically, questionnaires were distributed to the same subjects at two different time points (T1 and T2, with a four-month interval). This design had two main advantages. Firstly, collecting data from two distinct periods facilitated a more accurate establishment of causality since temporal precedence is a critical element of causal inference (O'Brien et al., 2011). Secondly, by gathering data at two separate time points, we effectively mitigated the threat of CMB, which is particularly prevalent in one-time surveys (M. L. Chen & Lin, 2014; Lin & Bhattacherjee, 2008, 2009).

Notably, the choice of a four-month interval between the two surveys was based on several considerations. On one hand, the literature suggests that the gap between surveys should be

sufficient to avoid short-term memory effects or emotional influences (Fletcher & Hove, 2012; Sakurai & Jex, 2012). On the other hand, an excessively long interval might increase interference from changes in the social environment, thereby affecting data stability. Therefore, four months was deemed an appropriate balance.

Two surveys were conducted, with 500 questionnaires distributed in each round. The first round of questionnaires was distributed in May 2023, and 482 valid questionnaires were successfully collected. The second round was distributed in September 2023, and 403 valid questionnaires were returned. To ensure the accuracy and reliability of the data, strict quality control measures were implemented after the questionnaires were collected.

Our questionnaire screening process was rigorous and meticulous. Firstly, to ensure the survey's anonymity and protect the respondents' privacy, we designed a unique identification code. This code was created by combining a portion of the respondents' surnames and a portion of the personal mobile phone numbers, allowing us to exclude questionnaires that were only completed in the first round but not in the second round using this identification system. Secondly, for respondents who completed both rounds of questionnaires, if one of the questionnaires was deemed invalid for any reason, the entire set of questionnaires was excluded from the analysis. Finally, questionnaires with obvious patterned answers were also excluded to ensure the authenticity of the data.

After careful collection and screening, 338 valid matched questionnaires from the two rounds were obtained, providing a solid foundation for subsequent hypothesis analysis. Table 3.1 presents the project source, evaluation waves, and a summary of their reliability in the literature.

Table 3.1 Item sources and reliability in the literature

Wave	Construct	items	Source/Reference	Cronbach's α
1st	Leader-Member Exchange	7	Wang et al.(2005)	0.92
1st	Job embeddedness	7	Crossley et al. (2007)	0.862
1st	Job satisfaction	6	sui et al. (1992)	0.75
1st	Turnover intention	4	Mobley et al. (1979)	0.755
2nd	Career Shocks	9	Ali et al. (2020)	0.92
2nd	Perceived opportunities	4	Weng and Xi (2010)	0.747
2nd	Job satisfaction	6	sui et al. (1992)	0.75
2nd	Turnover intention	4	Mobley et al. (1979)	0.755

Note. Wave denotes the data collection wave (1st or 2nd).

3.6 Statistical methods

Data analysis is a crucial aspect of this study, aiming to validate theoretical assumptions and provide rigorous research findings. Its core is ensuring scientific rigor, data reliability, and hypothesis testing accuracy. To this end, we employed various data analysis tools such as SPSS 26, AMOS 29, and PROCESS macro for SPSS.

Specifically, SPSS software was utilized for data preprocessing, descriptive statistical analysis, correlation analysis, exploratory factor analysis (EFA), hierarchical regression analysis. On the other hand, AMOS software focused on confirmatory factor analysis (CFA) to ensure the measurement model's goodness of fit and validity. PROCESS macro for SPSS, with its unique advantages in measuring mediation and moderation effects, helped us better understand the intrinsic relationships among variables.

During the data analysis process, we first conducted descriptive statistical analysis to describe the sample's essential characteristics and distribution in detail. Subsequently, we performed comprehensive reliability and validity tests on the scales in the questionnaire and detailed factor analysis to ensure the accuracy and effectiveness of the scales used, laying a solid foundation for subsequent analysis.

We employed statistical methods such as correlation analysis and regression analysis to further reveal the relationships among variables. These methods helped us explore the direct impacts of factors such as LMX, JE, JS, CS, and PO on TI and uncovered indirect effects and potential mediation mechanisms among them.

Finally, we comprehensively validated and tested the theoretical model using regression analysis and the functionalities of PROCESS macro for SPSS. This process verified the reasonableness of our theoretical assumptions and provided insights into how these variables interact and jointly influence TI. Through this rigorous data analysis process, we gained a more comprehensive understanding of the research problem and contributed new knowledge and insights to theory and practice in related fields.

3.6.1 Reliability analysis

Reliability, also known as measurement consistency, is a crucial indicator for assessing the performance of measurement tools. It gauges the stability and consistency of results obtained from repeated measurements conducted in different contexts or at different time points. Reliability analysis aims to ensure that measurement tools exhibit adequate consistency,

stability, and dependability, thereby accurately reflecting the actual characteristics of the measured objects. When reliability coefficients reach high levels, we can confidently assert that the results provided by the measurement tools are accurate and trustworthy.

To ensure the reliability of our measurement tools, this study adopted three critical criteria: (1) The internal consistency coefficient (Cronbach's α) must exceed 0.7. This coefficient assesses the consistency among items within a scale ranging from 0 to 1. Generally, a higher coefficient indicates a higher reliability of the scale. If the reliability coefficient is below 0.6, it suggests insufficient reliability, necessitating reconsidering the questionnaire design or data collection methods. Coefficients between 0.6 and 0.7 are considered minimally acceptable; those between 0.7 and 0.8 indicate good reliability; those between 0.8 and 0.9 suggest strong reliability, while coefficients between 0.9 and 1 indicate excellent scale reliability; (2) The correlation coefficient among items must be greater than 0.3. This ensures adequate relatedness among the items. If the correlation coefficient of an item with other items is less than 0.3, it suggests a lack of necessary association, recommending its removal; (3) The corrected item-total correlation coefficient must be greater than 0.5. This refers to the correlation coefficient between any given item and the sum of all other items within the construct. If an item's corrected item-total correlation coefficient is less than 0.5, it indicates inconsistency with other items within the construct, suggesting its deletion (Hair et al., 2010).

3.6.2 Validity analysis

Validity is a crucial metric that gauges the accuracy of a measurement tool or method in reflecting the essence of what is being measured. Validity analysis, on the other hand, assesses how these tools or designs precisely capture the target concepts or variables, focusing on verifying their accuracy and effectiveness. Various types of validity exist, such as face, content, criterion, and construct, which constitute a framework for evaluating the overall validity of measurement tools.

Content and construct validity are particularly significant in developing and evaluating measurement tools. To ensure content validity, which refers to the comprehensiveness of a measurement tool in covering all essential aspects of the measured concept, researchers often employ methods like expert consultation, group discussion, and bidirectional translation. These methods have also been applied in this study, where the questionnaire has undergone meticulous revision by incorporating authoritative scales and expert opinions to ensure the comprehensiveness and accuracy of its content.

Construct validity, on the other hand, emphasizes whether a measurement tool can precisely reveal the internal structure of the concept being measured. Researchers commonly use two methods to verify this: Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA). EFA initially primarily serves to explore the structural characteristics of a scale. At the same time, CFA further validates these structures' stability and rationality to ensure the measurement tool's effectiveness. In this study, we have strictly followed these analytical steps and used indicators such as χ^2/df, RMSEA, CFI, TLI, and SRMR to assess the goodness of fit of the CFA model.

These indicators have some differences in the academic community, so whether to accept the model depends on a comprehensive consideration based on multiple indicators and specific circumstances (Hou et al., 2004; L. Hu & Bentler, 1998, 1999; MacCallum et al., 1996; Ullman & Bentler, 2012). Specifically, for χ^2/ df, some scholars consider it acceptable if it is less than 4 (L. Hu & Bentler, 1998), but there are more stringent standards that suggest a range between 1 and 3 is more ideal (Hou et al., 2004); RMSEA < 0.1 is generally considered acceptable (MacCallum et al., 1996); while CFI and TLI > 0.9, SRMR < 0.08 indicate good model fit. It is worth noting that these fit indices are influenced by sample size, so the standards should be appropriately relaxed when the sample size is small. Additionally, these fit indices are highly influenced by sample size. When the sample size is small (e.g., less than 150), the standards should be appropriately relaxed, and the significance level should be set to 0.01 (Wen et al., 2004). Based on the above discussion, the acceptable standards used in this study are χ^2 / df < 4, RMSEA < 0.10, CFI > 0.9, TLI > 0.9, SRMR < 0.10. In conclusion, these fit indices should be considered comprehensively.

Before conducting factor analysis, this study assessed the scale's appropriateness through the Kaiser-Meyer-Olkin (KMO) test and Bartlett's sphericity test. We consider the scale suitable for subsequent factor analysis only when the KMO value is more significant than 0.70 and the result of Bartlett's sphericity test is significant. After ensuring that the scale meets these prerequisite conditions, we further conducted a factor analysis to extract common factors and validate the structural validity of the scale. Based on the excellent fit of the CFA model, we also examined the convergent and discriminant validity of each scale to ensure that the measurement tool demonstrates consistency when measuring similar concepts and distinctiveness when measuring different concepts. Through these rigorous validity analysis steps, we can have more confidence in assessing the accuracy and effectiveness of the measurement tool, thus providing solid data support for subsequent research.

3.6.3 Statistical description

Statistical description is a technical method that comprehensively synthesizes and delicately portrays data using mathematical and statistical principles. Its primary purpose is to aid researchers in gaining a deeper understanding of the inherent characteristics of data and to make reasonable inferences and analyses based on them. In statistical description, special attention should be paid to the central tendency and dispersion of data, as these two aspects can fully reveal the data's distribution patterns and critical features.

In this study, we have selected various statistical descriptive indicators to delve into the basic situation of demographic variables, including maximum, minimum, mean, and standard deviation. These indicators not only cover core demographic variables such as age, gender, education level, work experience, marital status, and job title but also paint a comprehensive and three-dimensional portrait of the research sample. Through these precise statistical descriptions, we can grasp the overall characteristics of the research subjects more clearly, laying a solid foundation for subsequent in-depth analysis and interpretation of results. Meanwhile, it also provides a powerful tool to extract more valuable information from the data.

3.6.4 Correlation analysis

Correlation analysis aims to delve into the relationships between two or more variables. The core of this method lies in assessing the degree of association and the direction of association between variables. Correlation coefficients, particularly the Pearson correlation coefficient, are pivotal in correlation analysis. It is a crucial metric for measuring the strength and direction of relationships between variables. The Pearson correlation coefficient ranges from -1 to 1 (Sherkatghanad et al., 2020). When the coefficient value approaches 1 or -1, it indicates a strong linear relationship between two variables. When the coefficient value approaches 0, it suggests a weak linear relationship between variables or possibly no linear correlation.

In this study, we chose Pearson correlation analysis as the primary method to explore relationships between variables. By analyzing the absolute values of correlation coefficients in the results, we can directly gauge the strength of correlations between measured variables. The larger the absolute value of the correlation coefficient, the stronger the correlation between the variables under consideration (Z. Li et al., 2022), thereby providing a robust quantitative basis for understanding and explaining the interactions between variables.

3.6.5 Regression analysis

Regression analysis aims to delve into the relationships between variables and utilize one or more independent variables (explanatory variables) to predict the potential values of a dependent variable (response variable). By constructing precise mathematical models, regression analysis can depict and quantify the dependencies between independent and dependent variables in detail, revealing their inherent connections and providing solid scientific support for prediction and decision-making.

When conducting regression analysis, researchers must clarify the research objectives and core issues, accurately define the dependent and independent variables, and comprehensively collect relevant data. The quality and integrity of the data are crucial to the accuracy and reliability of the regression analysis. Choosing an appropriate regression model for fitting is a critical step in regression analysis, typically involving model assumption testing, parameter estimation, model optimization, and adjustment.

After the model fitting is completed, systematic model diagnosis and evaluation are essential. This includes checking whether the residual distribution of the model is reasonable, whether there are potential issues such as heteroscedasticity and multicollinearity, and assessing the model's goodness of fit and predictive performance. Commonly used model evaluation metrics, such as the coefficient of determination (R^2) and adjusted R^2, provide researchers with a quantitative assessment basis.

This study employs hierarchical regression analysis and the PROCESS macro for SPSS developed by Hayes (2022). Hierarchical regression analysis is a statistical method that investigates differences among multiple regression models. By adding independent variables individually or layer by layer, it observes whether the changes in the model after adding one or more independent variables are statistically significant. This method compares the explanatory power of different regression models, helping to identify those independent variables that play an irreplaceable role and revealing their independent impact on the dependent variable. Compared to conventional hierarchical regression analysis, PROCESS can directly provide estimates of direct and indirect effects and results such as Bootstrap confidence intervals and Sobel tests. Additionally, PROCESS offers a variety of complex mediation and moderation models for researchers to choose from, making the computational process simpler and more efficient. By using PROCESS for complex model testing, researchers can more deeply reveal the interrelationships between variables and provide strong support for practical applications.

3.6.6 Common method variance analysis

Common Method Variance (CMV), also known as Common Method Bias (CMB), refers to the artificial covariance phenomenon between predictor variables and criterion variables due to the high similarity in data sources, raters, measurement contexts, item contexts, and characteristics of the items themselves. The root cause of this bias lies in the intertwining of multiple factors, such as the same data sources or raters, the characteristics of questionnaire items and content, and the measurement environment. Bias can seriously undermine the reliability and accuracy of model analysis results, thereby misleading research conclusions.

To minimize the potential impact on research results due to using the same method or data source, this study conducted two questionnaire surveys on the same group of respondents over four months. Additionally, we employed the Harman single-factor analysis approach (Podsakoff & Organ, 1986) to systematically examine the existence of common method bias. Specifically, we included all variables in an Exploratory Factor Analysis (EFA) framework. We determined the minimum number of factors required to explain variable variation by examining the unrotated factor analysis results. Suppose the analysis revealed only one factor or abnormally high explanatory power for a particular factor (usually over 50%). In that case, it can be determined that there is severe standard method bias.

In this study, we conducted a comprehensive exploratory factor analysis involving seven constructs. The analysis showed that seven factors were extracted, explaining 33.129%, 13.859%, 8.417%, 6.683%, 5.027%, 4.006%, and 2.951% of the total variance, respectively. Moreover, the variance explained by the most significant common factor was 33.129%, below 40%, indicating good data quality. These data suggest that the variance is unevenly distributed among multiple factors, proving that there is no severe standard method bias in the model, thus ensuring the reliability and accuracy of the research conclusions.

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Chapter 4: Leader-Member Exchange, Job Embeddedness, and Turnover Intention: The Mediating Role of Job Satisfaction

Previous studies have confirmed that LMX and JE negatively impact employees' TI. However, the underlying psychological mechanism behind this negative influence of LMX and JE on TI remains unclear. To address this issue, the present study adopts a perspective based on social exchange theory and JE theory to analyze and compare how JS may mediate the effects of LMX and JE on employees' TI. Furthermore, this study aims to determine which factor, JS, LMX, or JE, has more substantial explanatory power in the relationship between these variables and TI.

4.1 LMX and TI: The mediating role of JS

According to the core viewpoint of the LMX theory, the quality of the exchange relationship between employees and leaders profoundly impacts employees' work attitudes and behaviors. Within this framework, the concepts of "in-group" and "out-group" members reveal the differences in this relationship. Subordinates considered "in-group" members not only have the opportunity to participate in essential decision-making processes but also receive additional tasks and more opportunities for interaction with their leaders. This close collaborative relationship fosters mutual understanding and trust between leaders and subordinates, bringing higher JS, better performance, and lower employee work stress. Simultaneously, this high-quality exchange relationship increases the frequency of communication between leaders and subordinates, further enhancing work efficiency and team innovation outcomes.

In contrast, subordinates perceived as "out-group" members may be ignored by leaders, lacking opportunities for performance and advancement. Due to their distance from the leadership, they rarely have the chance to participate in decision-making processes or receive recognition and promotion from their leaders. This low-quality exchange relationship results in poor job performance and exposes employees to higher stress levels and dissatisfaction. Over time, as "out-group" members continue to feel undervalued and overwhelmed, their sense of self-efficacy diminishes, making them more prone to considering resignation and seeking new job opportunities.

Furthermore, a high-quality LMX can provide employees with additional opportunities for

career development. Through introductions and recommendations from leaders, employees can expand their social networks and connect with key individuals in other organization departments (Sparrowe & Liden, 1997). These expanded social networks may offer greater visibility, access to information, and other forms of support (Burt, 1992), enhancing the employee's career competitiveness and willingness to stay. Thus, the quality of the supervisor-subordinate relationship directly impacts the subordinate's TI. Relevant studies have also shown that the LMX metric better predicts turnover rates than employee attitude metrics (Graen et al., 1982; Mobley et al., 1979). This underscores the significance of establishing a high-quality exchange relationship with leaders to reduce employees' desire to leave.

Based on the above literature and discussion, we can propose the following hypothesis:

H1: LMX is negatively related to TI.

The LMX theory provides a solid theoretical foundation for understanding the interactive relationships between leaders and organizational members. This theory emphasizes that leaders establish relationships of varying qualities with different members, grounded in material and social exchanges. Leaders categorize members into "in-group" and "out-group " within this exchange dynamic." Members perceived as part of the "in-group" enjoy closer and deeper relationships with the leader, resulting in greater access to organizational resources, promotional opportunities, trust, and respect. This privileged status and treatment often significantly enhance their JS. Conversely, members labeled "out-group" may experience dissatisfaction and frustration due to lacking resources and opportunities.

Job satisfaction reflects employees' feelings and evaluations of their work environment, content, and outcomes. It plays a crucial bridging role in the relationship between LMX and TI. When employees perceive support, trust, and respect from their leaders, their sense of identification with the organization increases, leading to greater job involvement and, consequently, higher JS. This positive emotional state makes employees more appreciative of their current job opportunities and inclined to stay and continue developing within the organization. Conversely, if the relationship quality between employees and their leaders is higher, they may feel they need to be more valued, leading to decreased JS. In such cases, employees are more likely to develop TI and seek other job opportunities that better meet their needs.

The study by Gerstner and Day (1997) further supports this viewpoint by finding that LMX indirectly influences turnover behavior through its impact on other employee attitudes, such as satisfaction and organizational commitment. This suggests that JS significantly mediates between LMX and TI.

Based on the above literature review and discussion, we propose the following hypothesis:

H4a: JS mediates the relationship between LMX and TI.

4.2 JE and TI: The mediating role of JS

Since T. R. Mitchell et al. (2001) first introduced the concept of JE theory, it has garnered widespread attention in employee turnover research. Job embeddedness is the degree to which employees are embedded in their work or organization, reflecting various connections and ties between employees and their work or organization (Sekiguchi et al., 2008). These connections and ties include traditional work attitude factors such as JS and organizational commitment (Hossein & Somayeh, 2018) and a range of non-work factors such as community connections, family factors, and lifestyle compatibility.

Numerous studies have demonstrated that a higher level of JE is associated with a lower turnover rate (Crossley et al., 2007). This is because highly embedded employees have established strong connections and ties within their job or organization, which increases the costs and difficulties associated with leaving. Conversely, less embedded employees are more susceptible to external job opportunities due to their weaker ties to the job or organization.

Job embeddedness is a critical mediating construct between specific on-the-job and off-the-job factors and employee retention (T. R. Mitchell, Holtom, Lee, et al., 2001). In other words, JE explains why certain employees, facing similar work environments and turnover factors, choose to remain with an organization rather than leave immediately. This is because JE captures the unique connections and ties between employees and their work or organization that are often overlooked in traditional turnover theories.

Furthermore, JE has been revealed to mediate between job aspects and critical organizational outcomes (Holtom & Inderrieden, 2006). For instance, research has found that JE significantly predicts key organizational outcomes such as employee job performance (T. W. Lee et al., 2004), organizational citizenship behavior, and TI (T. R. Mitchell, Holtom, Lee, et al., 2001). This suggests that JE plays a crucial role in employees' turnover decisions and significantly impacts their behavior and performance within the organization.

Based on the above literature review and discussion, we propose the following hypothesis:

H2: JE is negatively related to TI.

Job embeddedness is a construct that describes the degree of an employee's connectedness to their job and organization (T. R. Mitchell, Holtom, Lee, et al., 2001). When employees are deeply embedded in their work, organization, and community, they often experience higher JS.

Job embeddedness implies that employees have established strong ties within their work environment, feel a high fit with the organization and colleagues, and perceive significant sacrifices associated with leaving their current job (Crossley et al., 2007). Such satisfaction, in turn, enhances their loyalty to the organization and willingness to stay, thereby reducing TI. Conversely, if employees' JE is low, they may feel dissatisfied with their work, weakening their connection to the organization and increasing the likelihood of turnover.

Moreover, highly embedded employees face higher turnover costs, including searching for a new job, adapting to a new environment, and losing the support of their existing social network. As a result, even in the face of external job opportunities or dissatisfying work conditions, they are more inclined to stay in their current organization (T. W. Lee et al., 2004). Thus, JS is a crucial psychological mechanism linking JE to TI.

Based on the above literature review and discussion, we propose the following hypothesis:

H4b: JS mediates the relationship between JE and TI.

4.3 JS and TI

Since March and Simon first proposed the employee turnover model in 1958, the relationship between JS and TI has been a focal point in organizational behavior. March and Simon's model emphasized two core antecedents of voluntary turnover: individuals' perceptions of desirability and ease of mobility. Building upon this foundation, subsequent scholars have further deepened our understanding of this relationship.

In the study by Jackofsky and Peters (1983), the perceived desirability of mobility was essentially equated with JS. This widely accepted perspective has become a fundamental cornerstone for subsequent research. Job satisfaction, the subjective evaluation of employees' overall feelings towards their current job or organization, encompasses various aspects, including job content, work environment, and compensation. When satisfied with these aspects, employees are more likely to feel a sense of belonging and loyalty to the organization, reducing their intention to leave.

Job satisfaction has gradually emerged as a strong predictor of voluntary turnover. Much empirical research supports the negative correlation between JS and TI (Mobley et al., 1978). This implies that enhancing employee JS effectively reduces turnover rates and enhances organizational stability.

However, it is essential to recognize that the relationship between JS and TI is not absolute. In certain situations, even if employees are satisfied with their current job, they may still have

intentions to leave due to external temptations or other personal reasons. Additionally, individual differences may exist in how JS is perceived, and TI is formed. Therefore, in practical applications, it is necessary to consider multiple factors comprehensively to predict and intervene in employee turnover behavior more accurately.

In summary, there is a close association between JS and TI. To enhance organizational stability and employee JS, managers should focus on and strive to improve critical factors that may influence employee satisfaction, such as job content, work environment, and compensation. Additionally, establishing effective communication channels and employee support systems can strengthen employees' sense of identification and belonging to the organization, thereby reducing the occurrence of TI.

Based on the literature review and discussion above, we propose the following hypothesis:

H3: JS is negatively related to TI.

To test the hypotheses above and delve deeper into the mechanisms of LMX and JE in employee turnover, this study has constructed a corresponding research model, as shown in Figure 4.1.

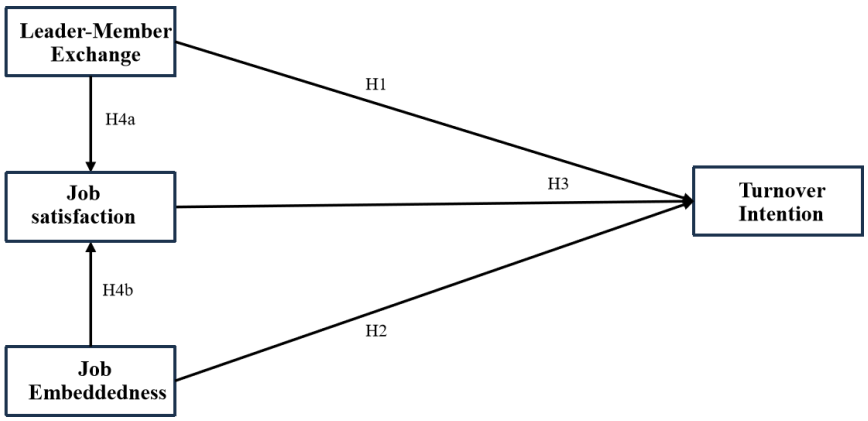

Figure 4.1 Research model 1

4.4 Research design

4.4.1 Sample and procedure

The sample selection and data sources for this chapter have already been elaborated on in Chapter 3; hence, they will not be repeated in this section.

4.4.2 Measurement of variables

The measurement of variables in this chapter has already been elaborated in Chapter 3. Therefore, it will not be repeated in this section.

4.5 Data analysis results

4.5.1 Reliability and validity analysis

In this study, we primarily relied on scales to measure critical factors. Therefore, it is essential to examine the data quality of the measurement results to ensure the meaningfulness of subsequent analyses. We first employed Cronbach's alpha reliability test to analyze the internal consistency of each dimension. The Cronbach's alpha coefficient ranges from 0 to 1, with higher values indicating higher reliability. Reliability coefficients below 0.6 are considered unreliable, requiring questionnaire redesign or data collection for further analysis. Coefficients between 0.6 and 0.7 are considered reliable, between 0.7 and 0.8 are reliable, between 0.8 and 0.9 are very reliable, and between 0.9 and 1 are highly reliable.

The results of the reliability analysis are shown in Annex B Table b.1. After computation, the Cronbach's alpha coefficients for the TI scale, LMX scale, JE scale, JS scale, CS scale, and PO scale were 0.881, 0.916, 0.821, 0.899, respectively. All coefficients significantly exceeded the threshold of 0.8. This result indicates that each scale used in this study demonstrates excellent internal consistency and reliability.

4.5.2 Validity analysis

Validity, or the effectiveness of a measurement, refers to the degree to which a measurement accurately assesses the intended construct. The closer the measurement aligns with the target construct, the higher the validity; conversely, the lower the validity. We analyzed the validity of our scales using factor analysis. The questionnaire was designed based on six observed variables from the research hypothesis model, and factor analysis was conducted on the corresponding measurement items for these six sections.

Orthogonal rotation of factors employed the maximum variance method. Based on the results of 25 iterations, principal components with eigenvalues greater than one were extracted as common factors. Each common factor retained 3 to 6 measurement items for subsequent modeling analysis. Measurement items were excluded if they met any of the following criteria:

1. Factor loadings less than 0.4 for each measurement item.

2. Factors with fewer than three measurement items: All items under that factor were deleted.

3. Measurement items with loadings greater than 0.4 on multiple factors were also removed.

4. Items inconsistent with the meaning of their respective factors or other items under the same factor were deleted.

Before applying factor analysis, a suitability test was conducted to determine if the survey data was appropriate for factor analysis. The results indicated that the KMO values for the questionnaire were all greater than 0.9, and the data passed Barlett's test of sphericity at a significance level of 0.05. This suggests that the measurement scope and content of the questionnaire meet the required standards (Y. P. Zhang et al., 2019). Details are presented in Annex B Table b.2.

4.5.3 Factor analysis of the TI scale

As shown in Annex B Table b.2, the KMO value for the TI scale is 0.814 (>0.70), and the result of Barlett's Test of Sphericity is significant at $p < 0.001$, indicating that the data is suitable for factor analysis. A first-order factor analysis was conducted on the four items of TI. Through principal component analysis, with eigenvalues greater than one as the criterion, one common factor was extracted. This suggests that a single factor can represent the hypothetical variable of TI, eliminating the need for orthogonal rotation. Consistent with the unidimensional nature of the scale, the factor loadings were set to their original proportions. This factor was labeled as "TI." The component matrix loadings, item names, and corresponding measurement items are presented in Annex B Table b.3. The variance explained by this factor is 74.931%. Reliability analysis was also conducted on the four-item TI scale, yielding a Cronbach's α of 0.881 (>0.70), indicating good scale reliability.

4.5.4 Factor analysis of the LMX scale

As indicated in Annex B Table b.2, the KMO value for the LMX scale is 0.90 (>0.70), and the result of Barlett's Test of Sphericity is significant at $p < 0.001$, suggesting that the data is appropriate for factor analysis. A first-order factor analysis was conducted on the seven items of the LMX scale. Through principal component analysis, with eigenvalues greater than one as the criterion, one common factor was extracted. This indicates that a single factor can adequately represent the hypothetical variable of LMX, eliminating the need for orthogonal

rotation. Consistent with its unidimensional structure, the factor loadings were maintained at their original proportions. This factor was designated as "Leader-Member Exchange." The component matrix loadings, item names, and corresponding measurement items are presented in Annex B Table b.4. The variance explained by this factor is 68.305%. Reliability analysis of the seven-item LMX scale yielded a Cronbach's α of 0.916 (>0.70), indicating strong reliability of the LMX scale.

4.5.5 Factor analysis of the JE scale

As shown in Annex B Table b.2, the KMO value for the JE Scale is 0.894 (>0.70), and the result of Bartlett's Test of Sphericity is $p < 0.001$, indicating that the data is suitable for factor analysis. A first-order factor analysis was conducted on the seven items of JE. Through principal component analysis, a single factor was extracted with an eigenvalue greater than 1, suggesting that the JE variable only requires one factor for representation, without the need for orthogonal rotation, and it is consistent with the original scale. This factor is labeled as "Job Embeddedness," and the component matrix loadings, names, and corresponding measurement items are shown in Annex B Table b.5. The factor loading coefficient of the 6th item is -0.242 < 0.4, indicating that the 6th item should be discarded. Exploratory factor analysis was conducted again. The result shows that KMO = 0.896 > 0.70, and one common factor was extracted from the six items, with a variance contribution rate of 73.498%. The factor loadings are shown in Annex B Table b.6. The reliability analysis of the 6-item JE scale yielded a Cronbach's α value of 0.927 (>0.70), indicating satisfactory reliability of the JE scale.

4.5.6 Factor analysis of the JS scale

As indicated in Annex B Table b.2, the KMO value for the JS Scale is 0.885 (>0.70), and the result of Barlett's Test of Sphericity is significant at $p < 0.001$, suggesting that the data is appropriate for factor analysis. A first-order factor analysis was conducted on the six items of JS. Through principal component analysis, one common factor was extracted using the criterion of eigenvalues greater than 1. This suggests that a single factor can represent the hypothetical variable of JS, eliminating the need for orthogonal rotation. Consistent with its unidimensional structure, the factor loadings were maintained at their original proportions. This factor was designated as "Job Satisfaction."

The component matrix loadings, item names, and corresponding measurement items for this factor are presented in Annex B Table b.7. The variance explained by this factor is 67.477%.

Reliability analysis of the six-item Job Satisfaction Scale yielded a Cronbach's α of 0.899 (>0.70), indicating the scale's strong reliability and internal consistency. This suggests that the JS scale is a reliable measure of JS and can be used confidently in research settings.

4.5.7 Confirmatory factor analysis

After confirming that the collected data is suitable for factor analysis through exploratory factor analysis, CFA is subsequently employed to examine the structural validity of the scale. CFA assesses the degree of association between each measurement item in the measurement model and the concepts they represent, as well as the associations between different concepts, to test theoretical models and optimize measurement tools, thereby enhancing the accuracy and reliability of the research. This study selected χ^2/df, RMSEA, CFI, IFI, TLI, CFI, and SRMR as the leading indicators to assess the goodness of fit between the model and the data. Hou et al. (2004) suggested that χ^2/df between 1 and 3 is an ideal indicator; MacCallum et al. (1996) considered RMSEA < 0.1 to be generally acceptable; and CFI and TLI > 0.9, SRMR < 0.08 indicate good model fit. This study used CFA to evaluate the model's fit, and the specific results are shown in Table 4.1. These results indicate that the model better fits statistically, thereby confirming the structural validity of the measurement model and ensuring that the research tool can effectively measure the intended constructs.

Table 4.1 Measurement model fit

Evaluation index	Desired value	Measured value	Fitting degree
χ^2	The smaller, the better	738.182	Good
df		224	
χ^2/df	1~3 Good fit	3.295	receivability
GFI	>0.80 receivability >0.90 Good fit	0.831	receivability
AGFI	>0.80 receivability >0.90 Good fit	0.791	receivability
IFI	>0.90	0.915	Good
TLI	>0.90	0.904	Good
CFI	>0.90	0.915	Good
SRMR	<0.05	0.0544	receivability
RMSEA	<0.08	0.083	receivability

4.5.8 Convergent validity

Convergent validity is assessed by evaluating the magnitude of correlations among variables within the same construct, validating its average explanatory power over its measurement items, and ensuring at least moderate correlation among variables within a construct. CR and AVE are two critical indicators for assessing the reliability and validity of the model. CR measures the

internal consistency of indicators of a latent variable, reflecting the correlations among measurement indicators of a latent variable. AVE measures the average explanatory power of the construct over its items. Hair et al. (2010) suggest that CR should be ≥ 0.7 and AVE should be > 0.5.

In Annex B Table b.8, the range of CR values is from 0.882 to 0.928, exceeding the threshold of 0.7, and the range of AVE values is from 0.559 to 0.790, surpassing the threshold of 0.5. These results indicate that the scales used for these variables demonstrate good convergent validity.

4.5.9 Discriminant validity

Discriminant validity analysis verifies whether there are statistically significant differences in the correlations between two distinct constructs. Items measuring different aspects should not exhibit high correlations. A commonly used method to test for discriminant validity among constructs is to compare AVE with the square of the Correlation Coefficient.

Correlation is a statistical technique used to examine the linear relationship between two variables, and the strength of this relationship is expressed through the correlation coefficient, also known as the Pearson product-moment correlation coefficient. The correlation coefficient is a standardized measure ranging from -1 to 1, where any observed correlation will be lower than the Pearson correlation coefficient, making it the maximum possible correlation between two variables.

AVE represents the average variance explained by a construct for its corresponding items and is one of the criteria for assessing convergent validity. A higher AVE indicates a more robust correlation among items measuring the same construct. For discriminant validity to exist, the correlation between items measuring different constructs should be lower than the correlation among items measuring the same construct.

Since AVE is a squared metric, it must be compared to the squared correlation coefficient. If the AVE of a construct is greater than the squared correlation coefficient between that construct and a different construct, or if the square root of the AVE is greater than the correlation coefficient, this provides evidence of discriminant validity (Fornell & Larcker, 1981). According to Annex B Table b.9, the results indicate good discriminant validity among the scales used in the study.

4.5.10 Descriptive statistical analysis of the sample

Refer to Annex B Table b.10 for the descriptive statistics of the sample distribution characteristics. Regarding gender, there are 94 male respondents, accounting for 27.8% of the total sample, and 244 female respondents, accounting for 72.2% of the total sample. Regarding age, the largest age group consists of 140 respondents between the ages of 30 and 39, accounting for 41.4% of the total sample, followed by 95 respondents aged between 40 and 49, accounting for 28.1% of the total. Regarding marital status, 247 respondents are married, constituting most of the sample, with a high proportion of 73.1%. Regarding educational background, most respondents hold a bachelor's degree, totaling 170 or 50.3% of the total, followed by 103 respondents with a master's degree, accounting for 30.5%. Regarding occupation, the number of medical doctors and nurses is relatively equal, with 166 and 172 individuals, respectively, accounting for 49.1% and 50.9% of the total sample. Regarding professional titles, most respondents hold intermediate titles, with 135 individuals accounting for 39.9% of the total, followed by 70 respondents with associate senior titles, accounting for 20.7%.

Additionally, a certain proportion of middle-level managers totaled 29 individuals or 8.6% of the sample. In terms of years spent working in the medical field, the most significant number of respondents, 152 individuals, have been working for 6 to 15 years, accounting for 45% of the total, followed by 74 respondents who have been working for less than five years, accounting for 21.9% of the total. Meanwhile, most respondents have not worked for long in the surveyed hospitals, with 95 individuals (28.1%) working for less than five years and 144 individuals (42.6%) working for 6 to 15 years. Finally, regarding family status, there are slightly more respondents without children, totaling 171 individuals or 50.6% of the total, while 105 respondents have one child, accounting for 31.1%. These data provide rich and comprehensive background information on the sample.

4.5.11 Descriptive statistics and correlation analysis

After conducting factor analysis, some measurement items among the observed variables were eliminated. The correlation between variables was analyzed using the Pearson correlation coefficient method. Annex B Table b.11 reports each variable's mean, standard deviation, and correlation coefficients. The analysis results indicate that there is a significant correlation between the variables. Specifically, TI has a significant negative correlation with LMX, JE, and JS; LMX has a significant positive correlation with JE, JS, and PCS; and JE has a significant positive correlation with JS.

4.6 Hypothesis testing

The present study proposes five research hypotheses: There is a negative correlation between LMX and TI (Hypothesis 1); JS mediates the relationship between LMX and TI (Hypothesis 4a). JE negatively correlates with TI (Hypothesis 2); JS mediates the relationship between JE and TI (Hypothesis 4b). There is a negative correlation between JS and TI (Hypothesis 3). Hierarchical regression analysis and PROCESS macro for SPSS were used to test these five research hypotheses.

4.6.1 Testing direct effects

The study proposed three direct effect hypotheses: (1) LMX is negatively associated with TI; (2) JE is negatively associated with TI; (3) JS is negatively associated with TI. These hypotheses were tested using hierarchical regression analysis, with separate regressions conducted for LMX, JE, and JS. Table 4.2 reports the results of the regression analysis.

Table 4.2 The direct effect of hierarchical regression analysis

Variables	TI			
	Model 1	Model 2	Model 3	Model 4
Gender	-0.028	-0.022	-0.013	0.028
Age	-0.195*	-0.34*	-0.154	-0.26*
Length of service	-0.045	0.1	0.052	0.049
LMX		-0.391***		
JE			-0.55***	
JS				-0.521***
R^2	0.054	0.2	0.339	0.319
R^2 Change		0.146	0.284	0.264
Adjusted R^2		0.19	0.331	0.31
F	6.395***	60.588***	143.212***	129.197***

Note. n=338, *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

Model 2 in Table 4.2 shows that LMX significantly and negatively influences TI (β = -0.391, $p < 0.001$), supporting Hypothesis 1. Similarly, from Model 3, JE significantly and negatively influences TI (β = -0.55, $p < 0.001$), supporting Hypothesis 2. Furthermore, Model 4 shows that JS significantly and negatively influences TI (β = -0.521, $p < 0.001$), supporting Hypothesis 3.

4.6.2 Testing mediation effects

This study puts forward two hypotheses regarding mediation effects: JS mediates the relationship between LMX and TI (Hypothesis 4a); JS mediates the relationship between JE and TI (Hypothesis 4b). To test these two hypotheses, this study utilized the PROCESS 4.1

plugin for SPSS software developed by Andrew F. Hayes. Compared to traditional hierarchical regression analysis, PROCESS offers several advantages. It estimates direct and indirect effects, Bootstrap confidence intervals, and Sobel test results. PROCESS also offers a wide range of complex mediation and moderation models, allowing researchers to easily select the appropriate model for their analysis.

1. The mediation effect of JS between LMX and TI was examined. Tables 4.3 and 4.4 report the results of the mediation analysis.

Observation of model M1:

In this model, LMX is the independent variable, and JS is the dependent variable. The regression model explains 44.0% of the variance in JS ($R^2 = 0.440$). The overall significance of the regression model is good ($F = 65.329$, $p < 0.001$). The standardized coefficient β_a between LMX and JS is 0.659, which is statistically significant ($p < 0.001$).

Table 4.3 Mediation effects test table

	JS	TI	TI
	M1	M2	M3
Gender	0.097*	-0.022	0.023
Age	0.120	-0.340***	-0.284***
Length of service	-0.063	0.100	0.070
LMX	0.659***	-0.391***	-0.083
JS			-0.468***
R^2	0.440	0.200	0.322
F	65.329***	20.799***	31.595***

Note. *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

Table 4.4 Results of bootstrap mediation effects test

	Effect	Boot SE	Boot LLCI	Boot ULCI	percentage
Indirect effect	-0.384	0.054	-0.497	-0.285	78.84%
Direct effect	-0.103	0.076	-0.253	0.047	21.16%
Total effect	-0.487	0.063	-0.610	-0.364	

Observation of model M2:

Here, LMX is the independent variable, and TI is the dependent variable. The regression model accounts for 20.0% of the variance in TI ($R^2 = 0.200$). The model's overall significance is vital ($F = 20.799$, $p < 0.001$). The standardized coefficient β_c between LMX and TI is -0.391, significant at the $p < 0.001$.

Observation of model M3:

In this model, LMX and JS are independent variables, while TI is the dependent variable. The regression model explains 32.2% of the variance in TI ($R^2 = 0.322$). The model is statistically significant ($F = 31.595$, $p < 0.001$). The standardized coefficient $\beta_{c'}$ between LMX and TI is now -0.083, which is not statistically significant. However, the standardized coefficient β_b between JS and TI is -0.468, significant at $p < 0.001$.

Bootstrap test for mediation:

Further analysis using the bootstrap method to test the mediation effect of JS between LMX and TI is presented in Table 4.6. The results indicate a significant total effect, a non-significant direct effect, and a significant indirect effect. This suggests that JS fully mediates the relationship between LMX and TI.

The findings support Hypothesis 4a, indicating that JS fully mediates the relationship between LMX and TI. The direct relationship between LMX and TI becomes non-significant when JS is included in the model, indicating that the effect of LMX on TI is transmitted through JS.

2. The mediation effect of JS between JE and TI was examined. Tables 4.5 and 4.6 report the results of the mediation analysis.

Table 4.5 Mediation effects test table

	JS	TI	TI
	M1	M2	M3
Gender	0.086*	-0.013	0.010
Age	-0.181**	-0.154	-0.202*
Length of service	0.046	0.052	0.064
JE	0.765***	-0.550***	-0.348***
JS			-0.264***
R^2	0.576	0.339	0.368
F	113.107***	42.642***	38.704***

Note. *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

Table 4.6 Results of bootstrap mediation effects test

	Effect	Boot SE	Boot LLCI	Boot ULCI	percentage
Indirect effect	-0.237	0.058	-0.350	-0.123	36.71%
Direct effect	-0.408	0.080	-0.565	-0.251	63.29%
Total effect	-0.644	0.054	-0.750	-0.538	

Observation of model M1:

In this model, JE is the independent variable, and JS is the dependent variable. The regression model accounts for 57.6% of the variance in JS ($R^2 = 0.576$), indicating a robust overall significance ($F = 113.107$, $p < 0.001$). The standardized coefficient β_a between JE and JS is 0.765, which is statistically significant ($p < 0.001$).

Observation of model M2:

JE is the independent variable, and TI is the dependent variable. The regression model explains 33.9% of the variance in TI ($R^2 = 0.339$), showing good overall significance ($F = 42.642$, $p < 0.001$). The standardized coefficient β_c between JE and TI is -0.550, significant at the $p < 0.001$.

Observation of model M3:

In this model, JE and JS are independent variables, while TI is the dependent variable. The regression model accounts for 36.8% of the variance in TI ($R^2 = 0.368$), indicating overall solid significance ($F = 38.704$, $p < 0.001$). The standardized coefficient $\beta_{c'}$ between JE and TI is now -0.348, which remains statistically significant ($p < 0.001$). Additionally, the standardized coefficient β_b between JS and TI is -0.264, significant at $p < 0.001$.

Bootstrap test for mediation:

Further analysis using the Bootstrap method was conducted to test the mediation effect of JS between JE and TI. The results, presented in Table 4.6, indicate a significant total effect, a significant direct effect, and a significant indirect effect. This suggests that JS partially mediates the relationship between JE and TI.

The findings support Hypothesis 4b, indicating that JS partially mediates the relationship between JE and TI. JE's direct and indirect effects on TI through JS are significant, indicating that JS is mediating in this relationship.

4.7 Results and discussion

Based on the theories of LMX and JE, this study introduced the mediating variable of JS to explore the underlying mechanisms among LMX, JE, and TI. Five research hypotheses were tested, and the results consistently found that (1) LMX is negatively correlated with TI; (2) JS mediates the relationship between LMX and TI; (3) JE is negatively correlated with TI; (4) JS mediates the relationship between JE and TI; (5) JS is negatively correlated with TI.

4.7.1 Negative correlation between LMX and TI

In this study, the LMX theory describes and quantifies the relationship quality between hospital medical staff and their superiors. This relationship quality is based on employees' perceptions of the support, understanding, and trust their leaders provide and the depth of interaction and connection between the two parties. The quality of LMX is a crucial predictor of employee organizational behavior, including TI.

The results of this study reveal a significant negative correlation between LMX and TI, which is consistent with the findings of most empirical studies (e.g., Le Blanc et al., 1993; Major et al., 1995; Sparrowe, 1994; Vecchio & Gobdel, 1984; Wilhelm et al., 1993). A meta-analysis (Gerstner & Day, 1997) reported an effect size of $r = 0.31$ ($SD = 0.08$) for the relationship between LMX quality and TI. Subsequent research has also shown that the LMX-TI relationship is negative for manufacturing employees (Adil & Awais, 2016), college student-

athletes (Chiu et al., 2022), police officers (AlHashmi et al., 2019), clinicians (Aarons et al., 2020), university teachers (Nguyen et al., 2023), civil servants(Siyal & Peng, 2018), and employees in sports organizations (Yildiz, 2018). Therefore, developing high-quality relationships with subordinates reduces employees' tendency to resign. Additionally, some research suggests that the relationship between LMX and TI is best represented by a curved line (Harris et al., 2005), as subordinates in low-quality relationships will be "pushed out" of the organization, while individuals in high-quality relationships will gain opportunities and ambitions, thus being attracted by other organizations ("pulled out"), ultimately leading to an increase in TI.

This finding emphasizes the importance of a good relationship between leaders and members. When leaders can accurately recognize and leverage their subordinates' work capabilities and potential while making them feel respected and cared for, employees are more likely to remain stable within the organization. This stability is reflected in employee retention, job engagement, and team collaboration. Conversely, leaders need to provide necessary support or assistance when subordinates encounter challenges so that employees can avoid leaving in search of a more supportive work environment.

In the healthcare industry, this leader-member relationship is particularly crucial. Medical work's systematic and complex nature requires doctors to receive adequate guidance and support during their growth. Support from supervising physicians and department heads can assist medical staff in learning professional knowledge and patient communication skills and provide necessary help when facing diagnostic and treatment challenges. When medical staff feel their growth and value within the team and practical support during difficult times, their dependence on the team increases, and their TI decreases accordingly.

Therefore, the quality of LMX significantly impacts medical staff retention. Hospital administrators should recognize that establishing and maintaining high-quality LMX relationships can not only reduce talent turnover but also enhance the quality of medical services and strengthen the overall competitiveness of the hospital. This requires hospital leadership to continuously improve their leadership abilities, including enhancing communication skills, strengthening team collaboration, and better recognizing and leveraging the potential of medical staff, thereby creating a more stable and supportive work environment.

4.7.2 Negative correlation between JE and TI

Job embeddedness is a comprehensive concept describing the degree of interaction and connectedness between employees and their work environment. This concept goes beyond

traditional JS theories or organizational commitment, offering a more holistic perspective on why employees stay within an organization. Job embeddedness encompasses multiple dimensions, such as the fit between the employee and the organization, links to the job, and connections with the community.

When quantifying JE, researchers often consider aspects such as an employee's adaptability to their job role, identification with organizational culture and values, the closeness of their work relationship network, and the balance between work and personal life. These factors collectively contribute to the "stickiness" that keeps employees within an organization, creating multiple psychological and practical barriers to leaving, thereby increasing the cost of turnover.

The results of this study indicate a significant negative correlation between JE and TI. This finding aligns with most of the empirical research (Jiang et al., 2012; T. W. Lee et al., 2004; T. R. Mitchell, Holtom, Lee, et al., 2001), suggesting that when employees feel deeply embedded in their work and organization, they are more inclined to remain in their current positions. This sense of embeddedness stems from employees' identification with the organization, JS, and positive relationships with colleagues and supervisors. Meanwhile, a study by Holtom and O'Neill (2004) involving a random sample of 500 employees from a community hospital in the northwestern United States also demonstrates that JE predicts turnover better than a combination of perceived mobility indicators (JS, organizational commitment) and the ease of perceived mobility indicators (job alternatives, job search). Job embeddedness emerges as a valuable perspective for assessing employee retention rates in healthcare organizations.

The concept of JE is particularly crucial in the healthcare industry. Healthcare professionals often face more significant job risks and challenges than those in other industries, including long working hours, emotional stress, and the psychological burden of dealing with life-and-death issues. Suppose healthcare organizations can provide a safe and supportive work environment for their staff. In that case, it can alleviate these pressures and enhance employees' trust and reliance on the organization. Healthcare organizations can promote staff retention, improving patient care and overall organizational performance by fostering a strong sense of JE.

4.7.3 Negative correlation between JS and TI

Job satisfaction is crucial for gauging employees' feelings about various aspects of their professional lives. It encompasses their interest and enthusiasm for the job content and extends to the work environment, interpersonal relationships, compensation and benefits, career development, and organizational identification. The level of JS directly impacts employees'

work performance, engagement, and willingness to stay in their positions. Quantitatively, JS is measured across several dimensions, including satisfaction with job promotions, colleagues, supervisors, and one's work and satisfaction with compensation levels.

The findings of this study reveal a negative correlation between JS and TI. This conclusion aligns with previous empirical research (De Simone et al., 2018; Irvine & Evans, 1995; Liu et al., 2018; Meyer et al., 2002; Spector, 1994), emphasizing JS as a prominent predictor of TI (Lambert et al., 2001, p. 233). Furthermore, research by G. Chen et al. (2011) indicates that systematic improvements or declines in JS over time explain changes in employees' "TI." However, some empirical studies have shown insignificant relationships between JS and TI (Brunetto et al., 2012; Currivan, 1999).

This conclusion suggests that employees who are satisfied with their jobs are less likely to leave their current positions. Therefore, enhancing JS is critical for organizations to maintain talent stability.

To this end, organizations can take several steps to improve employee satisfaction consistently. Ensuring transparency and fairness in career advancement allows employees to see that their efforts can yield reasonable rewards. Regular market salary surveys should be conducted to ensure that employee compensation aligns with their skills, experience, and market standards. Establishing a supportive work environment that fosters teamwork and positive colleague relationships is essential. Reinforcing a positive organizational culture through activities, training, and communication strategies can enhance employees' sense of belonging and identification. Providing training and development opportunities helps employees upgrade their skills and achieve personal career goals.

In the healthcare industry, the satisfaction of medical professionals is particularly crucial, as it affects individual doctors' growth and the development of medical institutions. Reasonable employee satisfaction can lead to better medical services, enhancing the hospital's social reputation and increasing doctors' influence. Through this enhanced influence, doctors may have opportunities to further improve their diagnostic and treatment skills, achieving personal breakthroughs. Therefore, increasing medical staff satisfaction brings stability to the hospital's talent pool and fosters greater trust and support for the medical institution among doctors.

Enhancing JS reduces employee turnover and improves their well-being and work efficiency, leading to long-term benefits for the organization.

4.7.4 JS as a complete mediator between LMX and TI

This study uncovers the relationship between JS and TI within the LMX theory framework

through rigorous empirical analysis. The findings reveal that JS fully mediates the relationship between LMX and TI. Specifically, this means that the quality of interaction between leaders and members directly impacts employees' JS, which determines their willingness to leave the organization. In other words, establishing a high-quality exchange relationship between leaders and employees enhances JS and reduces the likelihood of employees leaving the organization. The research results of Han and Jekel (2011) also support this finding, indicating that JS mediates the link between LMX and TI. Additionally, this study echoes Gerstner and Day's (1997) call to explore potential mediators between LMX and turnover.

This research underscores the significance of the relationship between leaders and their subordinates. Leaders' behaviors and management styles profoundly impact employees' daily work experiences. A supportive, caring, and recognizing leader can foster employee trust and loyalty, leading to a positive leader-member relationship that significantly enhances JS. The study also demonstrates that maintaining a good relationship with one's supervisor can help organizations retain talent by increasing employee JS.

4.7.5 JS plays a partial mediating role between JE and TI

The empirical analysis in this study delves deeply into the impact of JE on employee behavior, particularly its relationship with JS and TI. The findings reveal that JS partially mediates between JE and TI. This suggests that JE directly affects employees' willingness to leave and indirectly influences it by enhancing JS.

When employees feel embedded in their work — that is, when they perceive a good fit between their skills and job requirements, have strong ties with colleagues and the organization, and identify with the organization's goals and values — their JS is often higher. This increase in satisfaction, in turn, reduces their tendency to seek other job opportunities, thereby lowering TI.

This discovery underscores the importance of fostering a sense of JE among employees. The deeper an employee's investment in their work, the higher their satisfaction typically is, and correspondingly, the lower their likelihood of leaving the organization. Therefore, organizations should continually enhance employees' JE to improve JS, reduce turnover rates, and promote organizational stability and overall performance. Strategies such as providing relevant training and development opportunities, fostering a positive work environment, and encouraging employee participation in decision-making can enhance JE and reduce TI.

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Chapter 5: Leader-Member Exchange, Job Embeddedness, Job Satisfaction, and Turnover Intention: The Moderating Role of Career Shock and Perceived Opportunities

The impact of LMX, JE, and JS on employees' Turnover Intention has received widespread attention in academic circles. However, the conclusions reached need to be more consistent. So, what factors lead to this inconsistency? To answer this question, this study explores how CS and PO moderate the impact of LMX, JE, and JS on employees' Turnover Intention based on the theories of LMX and JE.

5.1 How does CS moderate the relationship between LMX, JE, JS, and TI

As a unique and unsettling event, CS plays a crucial role in employees' consideration of their attachment to work and decisions regarding turnover. It disrupts the equilibrium between the employee and the work environment and triggers various emotional and cognitive responses, influencing the employee's attitude and behavior toward work.

Employees' intention to leave (or stay) is often not isolated but influenced by the surrounding environment or specific events (Maertz & Campion, 2004). Career shock is an event that generates information or provides meaning related to personal work, which employees interpret and integrate into their belief and identity systems. This integration process not only affects employees' cognition and evaluation of work but also has the potential to alter their emotional attachment and behavioral tendencies toward it.

Personal shocks, such as winning the lottery, a spouse's job transfer, losing a loved one, or adopting a baby, can lead to intense emotional fluctuations, creating a solid intention for employees to leave (or choose to stay). These events often disrupt employees' life balance, forcing them to reevaluate their career plans and goals. On the other hand, organizational shocks more directly affect an employee's attachment to the organization, JS, and the quality of their exchange with leadership (LMX). For instance, events like failing to get a promotion, receiving a new job offer, having a dispute with the boss, receiving a significant bonus, or company layoffs can all trigger TI by changing an employee's perceptions and emotional responses toward the organization. These shock events influence an employee's evaluation of their current

job and alter their expectations and plans for future career development. However, it is worth noting that not all shock events lead to TI. According to research on affective events theory, "positive workplace events" may become more deeply embedded in an employee's mind (rather than prompting them to leave) (Judge et al., 2017). These positive events can enhance an employee's attachment to and satisfaction with their job by fostering positive emotions or affective responses, potentially offsetting TI caused by other shock events.

Based on the above literature review and discussion, we propose the following hypotheses:

H5a: CS moderate the relationship between LMX and TI. This relationship is more robust when CS is high compared to low.

H5b: CS moderate the relationship between JE and TI. This relationship is more robust when CS is high compared to low.

H5c: CS moderate the relationship between JS and TI. This relationship is more robust when CS is high compared to low.

5.2 How PO moderate the relationship between LMX, JE, JS, and TI

Perceived opportunities, as a critical variable, reflect employees' assessments of the external job market and reveal how they weigh current work conditions against external opportunities when considering turnover.

Firstly, in environments of high unemployment, employees often reassess the risks and costs associated with leaving their jobs. Research by Hom and Kinicki (2001) and T. W. Lee and Mitchell (1994) indicates that high unemployment effectively discourages employees from translating TI into actual actions. This is because, when the job market is unfavorable, employees recognize the lower likelihood of finding new employment, leading them to value their current positions more, even if there are aspects, they find unsatisfactory.

Schneider's (1976) study further emphasizes the importance of perceived alternatives in predicting and understanding TI. Indeed, when employees perceive better job opportunities externally, they are more likely to consider leaving. However, if these alternatives are less clear or easily accessible, employees may reconsider leaving.

Research by Dansereau et al. (1974) demonstrates the role of PO in moderating the relationship between job attitudes and turnover rates. Their study suggests that employees may be more cautious about leaving when they believe their employment opportunities in the current job market are limited. This is because they recognize that turnover may carry more significant risks and uncertainties in a scarce job market.

Hom et al. (1992) research reveals a significant finding: labor market conditions notably moderate the relationship between job dissatisfaction and voluntary turnover. When the labor market is tight, the push effect of job dissatisfaction on turnover is relatively weakened. This is because employees know that choosing to leave under such circumstances could hinder their career progression and make it difficult to find new job opportunities. Conversely, in environments with lower unemployment rates, JS has a more prominent influence on turnover decisions (Gerhart, 1987; Youngblood et al., 1985).

Through empirical research, Wheeler et al. (2007) further validated the moderating role of PO in the relationship between employee JS and TI. The study found that when employees are dissatisfied with their jobs, their intention to leave may increase if they perceive better career opportunities externally. However, if they perceive a sluggish external job market with limited employment opportunities, they may choose to remain in their current positions despite these roles not fully meeting their expectations.

PO also plays a crucial moderating role when communication quality between employees and leaders is poor. Employees who feel that their current organization is not conducive to their growth may develop intentions to leave. However, the level of these intentions is influenced by PO. If the job market is favorable and employees perceive better job opportunities externally, their intention to leave may strengthen. Conversely, suppose the job market is tough, and employees perceive fewer external employment opportunities. In that case, their intention to leave may weaken because they realize that leaving under current circumstances could entail more significant risks and uncertainties.

Based on the literature review and discussion above, we can propose the following hypotheses:

H6a: PO moderate the relationship between LMX and TI, which is more robust when PO is higher than low.

H6b: PO moderate the relationship between JE and TI, which is more robust when PO is higher than low.

H6c: PO moderate the relationship between JS and TI, which is more robust when PO is higher than low.

To verify the above hypotheses and further explore the mechanism of PO and CS in employee turnover, this study constructed a corresponding research model, as shown in Figure 5.1.

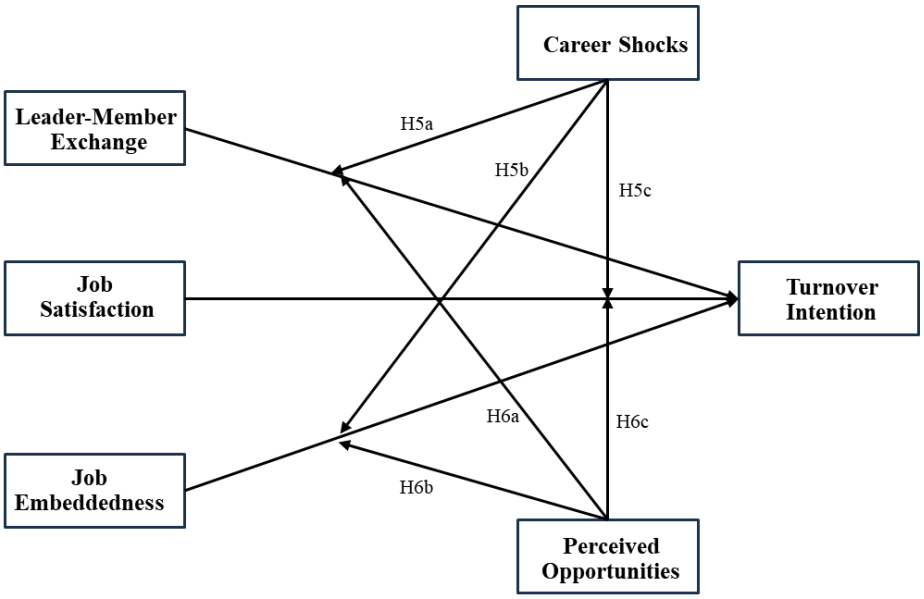

Figure 5.1 Research model 2

5.3 Research design

5.3.1 Sample and procedure

The sample selection and data sources for this chapter have already been elaborated on in Chapter Three; hence, they will not be repeated in this section.

5.3.2 Measurement of variables

The measurement of variables in this chapter has already been elaborated in Chapter Three. Therefore, it will not be repeated in this section.

5.4 Data analysis results

5.4.1 Reliability analysis

In this study, we primarily relied on scales to measure critical factors. Therefore, it is essential to examine the data quality of the measurement results to ensure the meaningfulness of subsequent analyses. We first employed Cronbach's alpha reliability test to analyze the internal consistency of each dimension. The Cronbach's alpha coefficient ranges from 0 to 1, with higher values indicating higher reliability. Generally, reliability coefficients below 0.6 are considered unreliable, requiring questionnaire redesign or data collection for further analysis. Coefficients between 0.6 and 0.7 are considered reliable, between 0.7 and 0.8 are reliable, between 0.8 and

0.9 are very reliable, and between 0.9 and 1 are highly reliable.

The results of the reliability analysis are shown in Annex B Table b.12. After computation, the Cronbach's alpha coefficients for the TI scale, LMX scale, JE scale, JS scale, CS scale, and perceived opportunity scale were 0.881, 0.916, 0.821, 0.899, 0.878, and 0.919, respectively. All coefficients significantly exceeded the threshold of 0.8. This result indicates that each scale used in this study demonstrates excellent internal consistency and reliability.

5.4.2 Validity analysis

Validity, or the effectiveness of a measurement, refers to the degree to which a measurement accurately assesses the intended construct. The closer the measurement aligns with the target construct, the higher the validity; conversely, the lower the validity. We analyzed the validity of our scales using factor analysis. The questionnaire was designed based on six observed variables from the research hypothesis model, and factor analysis was conducted on the corresponding measurement items for these six sections.

Orthogonal rotation of factors employed the maximum variance method. Based on the results of 25 iterations, principal components with eigenvalues greater than one were extracted as common factors. Each common factor retained 3 to 6 measurement items for subsequent modeling analysis. Measurement items were excluded if they met any of the following criteria:

1. Factor loadings less than 0.4 for each measurement item.

2. Factors with fewer than three measurement items: All items under that factor were deleted.

3. Measurement items with loadings greater than 0.4 on multiple factors were also removed.

4. Items inconsistent with the meaning of their respective factors or other items under the same factor were deleted.

Before applying factor analysis, a suitability test was conducted to determine if the survey data was appropriate for factor analysis. The results indicated that the KMO values for the questionnaire were all greater than 0.9, and the data passed Barlett's test of sphericity at a significance level of 0.05. This suggests that the measurement scope and content of the questionnaire meet the required standards (Y. P. Zhang et al., 2019). Details are presented in Annex B Table b.13.

5.4.3 Factor analysis of the TI scale

The reliability analysis of the TI scale has been analyzed in Chapter 4 and will not be repeated

in this chapter.

5.4.4 Factor analysis of the LMX scale

The reliability analysis of the Leader-Member Exchange Scale has been conducted in Chapter 4 and will not be repeated in this chapter.

5.4.5 Factor analysis of the JE scale

The reliability analysis of the Job Embeddedness Scale has been conducted in Chapter 4 and will not be repeated in this chapter.

5.4.6 Factor analysis of the JS scale

The reliability analysis of the Job Satisfaction Scale has been conducted in Chapter 4 and will not be repeated in this chapter.

5.4.7 Factor analysis of the CS scale

As shown in Annex B Table b.13, the KMO value for the CS Scale is 0.874 (>0.70), and the result of Bartlett's Test of Sphericity is $p < 0.001$, indicating that the data is suitable for factor analysis. Annex B Table b.14 suggests that two main components can be extracted (the eigenvalues of the first two principal components are more significant than 1), explaining 70.764% of the variance. Therefore, it is considered ideal that the two main components extracted sufficiently capture and explain the information of the original variables. Annex B Table b.15 displays that after principal component analysis extraction and rotation, the measurement items are clustered into two factors, namely PCS and NCS. The factor loading coefficients of the first item are 0.427 and 0.509, indicating that the first item should be discarded. Exploratory factor analysis was conducted again. The results show that KMO = 0.860 > 0.70, and two common factors were extracted from the eight items, accounting for 74.868% of the variance. The factor loadings are shown in Annex B Table b.16. The reliability analysis of the 6-item JE scale yielded a Cronbach's α value of 0.869 (>0.70), indicating satisfactory reliability of the CS scale.

5.4.8 Factor analysis of the PO Scale

As indicated in Annex B Table b.13, the KMO value for the PO Scale is 0.834 (>0.70), and the result of Barlett's Test of Sphericity is significant at $p < 0.001$, suggesting that the data is

appropriate for factor analysis. A first-order factor analysis was conducted on the four items of perceived opportunity. Through principal component analysis, one common factor was extracted using the criterion of eigenvalues greater than 1. This suggests that a single factor can represent the hypothetical variable of perceived opportunity, eliminating the need for orthogonal rotation. Consistent with its unidimensional structure, the factor loadings were maintained at their original proportions. This factor was designated as "Perceived Opportunity."

The component matrix loadings, item names, and corresponding measurement items for this factor are presented in Annex B Table b.17. The variance explained by this factor is 80.724%. Reliability analysis of the four-item PO Scale yielded Cronbach's α of 0.916 (>0.70), indicating the scale's strong reliability and internal consistency. This suggests that the PO Scale is a reliable measure of PO and can be used confidently in research settings.

5.4.9 Confirmatory factor analysis

After confirming that the collected data is suitable for factor analysis through exploratory factor analysis, CFA is subsequently employed to examine the structural validity of the scale. CFA assesses the degree of association between each measurement item in the measurement model and the concepts they represent, as well as the associations between different concepts, to test theoretical models and optimize measurement tools, thereby enhancing the accuracy and reliability of the research. This study selected χ^2/df, RMSEA, CFI, IFI, TLI, CFI, and SRMR as the leading indicators to assess the goodness of fit between the model and the data. Hou et al. (2004) suggested that χ^2/df between 1 and 3 is an ideal indicator; MacCallum et al. (1996) considered RMSEA < 0.1 to be generally acceptable; and CFI and TLI > 0.9, SRMR < 0.08 indicate good model fit. This study used CFA to evaluate the model's fit, and the specific results are shown in Table 5.1.

Table 5.1 Measurement model fit

Evaluation index	Desired value	Measured value	Fitting degree
χ^2	The smaller the better	1236.55	Good
df		539	
χ^2/df	1~3 Good fit	2.294	Good
GFI	>0.80 receivability >0.90 Good fit	0.823	Good
AGFI	>0.80 receivability >0.90 Good fit	0.794	receivability
IFI	>0.90	0.926	Good
TLI	>0.90	0.918	Good
CFI	>0.90	0.925	Good
SRMR	<0.05	0.0517	receivability
RMSEA	<0.08	0.062	Good

These results indicate that the model better fits statistically, thereby confirming the structural validity of the measurement model and ensuring that the research tool can effectively measure the intended constructs.

5.4.10 Convergent validity

Convergent validity is assessed by evaluating the magnitude of correlations among variables within the same construct, validating its average explanatory power over its measurement items, and ensuring at least moderate correlation among variables within a construct. CR and AVE are two critical indicators for assessing the reliability and validity of the model. CR measures the internal consistency of indicators of a latent variable, reflecting the correlations among measurement indicators of a latent variable. AVE measures the average explanatory power of the construct over its items. Hair et al. (2010) suggest that CR should be ≥ 0.7 and AVE should be > 0.5.

In Annex B Table b.18, the range of CR values is from 0.882 to 0.928, exceeding the threshold of 0.7, and the range of AVE values is from 0.559 to 0.790, surpassing the threshold of 0.5. These results indicate that the scales used for these variables demonstrate good convergent validity.

5.4.11 Discriminant validity

Discriminant validity analysis verifies whether there are statistically significant differences in the correlations between two distinct constructs. Items measuring different aspects should not exhibit high correlations. A commonly used method to test for discriminant validity among constructs is to compare the AVE with the square of the Correlation Coefficient.

Correlation is a statistical technique used to examine the linear relationship between two variables, and the strength of this relationship is expressed through the correlation coefficient, also known as the Pearson product-moment correlation coefficient. The correlation coefficient is a standardized measure ranging from -1 to 1, where any observed correlation will be lower than the Pearson correlation coefficient, making it the maximum possible correlation between two variables.

AVE represents the average variance explained by a construct for its corresponding items and is one of the criteria for assessing convergent validity. A higher AVE indicates a more robust correlation among items measuring the same construct. For discriminant validity to exist, the correlation between items measuring different constructs should be lower than the correlation

among items measuring the same construct.

Since AVE is a squared metric, it must be compared to the squared correlation coefficient. If the AVE of a construct is greater than the squared correlation coefficient between that construct and a different construct, or if the square root of the AVE is greater than the correlation coefficient, this provides evidence of discriminant validity (Fornell & Larcker, 1981).

According to Annex B Table b.19, the results indicate good discriminant validity among the scales used in the study.

5.4.12 Descriptive statistical analysis of the sample

The descriptive statistics of the samples has been conducted in Chapter 4 and will not be repeated in this chapter.

5.4.13 Descriptive statistics and correlation analysis

Pearson correlation analysis was performed to examine the relationships between variables after conducting a factor analysis and removing some measurement items from the observed variables. Annex B Table b.20 presents each variable's means, standard deviations, and correlation coefficients. According to the analysis results, significant correlations were found between the variables. Specifically, TI is significantly negatively correlated with LMX, JE, and JS and positively correlated with NCS and PO. LMX is significantly positively correlated with JE, JS, and PCS. JE is significantly positively correlated with JS and significantly negatively correlated with NCS and PO. JS is significantly positively correlated with PCS and significantly negatively correlated with NCS and PO. NCS is significantly positively correlated with PCS and PO.

5.5 Hypothesis testing

This study proposes six hypotheses on moderating effects: PO moderates the relationships between LMX, JE, JS, and TI (Hypothesis 6a, Hypothesis 6b, Hypothesis 6c); CS moderates the relationships between LMX, JE, JS, and TI (Hypothesis 5a, Hypothesis 5b, Hypothesis 5c).

5.5.1 To verify the moderating effect of PO on the relationship between LMX, JS, and TI.

Table 5.2 reports the results of the moderating effect analysis of PO.

Observation of model M2:

The regression model explains 32.3% ($R^2 = 0.323$) of the variance in the dependent variable (TI), with overall significant regression results ($F = 19.652$, $p < 0.001$). The standardized coefficient between LMX and TI is $\beta = -0.162$ ($p < 0.001$), while the coefficient for the interaction term "LMX×PO" with the dependent variable TI is $\beta_{int\text{-}1} = -0.167$ ($p < 0.05$), both statistically significant. This suggests that PO negatively moderates the negative direct effect between LMX and TI. On the other hand, the standardized coefficient between JS and TI is $\beta = -0.378$ ($p < 0.001$). However, the coefficient for the interaction term "JS×PO" with the dependent variable TI is $\beta_{int\text{-}2} = -0.106$ ($p > 0.05$), which is not statistically significant. This indicates that PO does not moderate the relationship between JS and TI.

Table 5.2 Results of analytics for testing the moderation effects of perceived opportunities

	JS			TI		
		M1			M2	
	Coeff	*SE*	*t*	Coeff	*SE*	*t*
Constant	-0.299	0.184	-1.625	2.218	0.220	10.062
Gender	0.084	0.084	0.990	0.064	0.101	0.631
Age	0.118	0.079	1.502	-0.203	0.094	-2.150*
Length of service	-0.049	0.076	-0.651	0.011	0.090	0.121
LMX	0.513	0.052	9.912***	-0.162	0.071	-2.291*
JS				-0.378	0.067	-5.683***
PO				0.312	0.054	5.794***
LMX × PO				-0.167	0.071	-2.353*
JS × PO				0.106	0.067	1.576
R^2		0.237			0.323	
F		25.839***			19.652***	

Note. *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

A simple slope test is required to validate further the moderating effect identified through path analysis. Researchers often split the sample into high and low groups based on the mean of the moderating variable plus or minus one standard deviation and then create a moderation effect plot to illustrate the specific moderation effects. This study used an Excel macro file developed by Professor Jeremy Dawson from the School of Management at the University of Sheffield to generate the simple slope plot. The plot is presented in Figure 5.2. The results show that when PO is high, LMX negatively affects TI ($\beta = -0.320$, $t = -3.315$, $p < 0.001$). However, when PO is low, the influence of LMX on TI is insignificant ($\beta = -0.0033$, $t = -0.034$, n.s.). Therefore, there is evidence of a moderation effect, indicating that as PO increases, the predictive power of LMX on TI gradually strengthens.

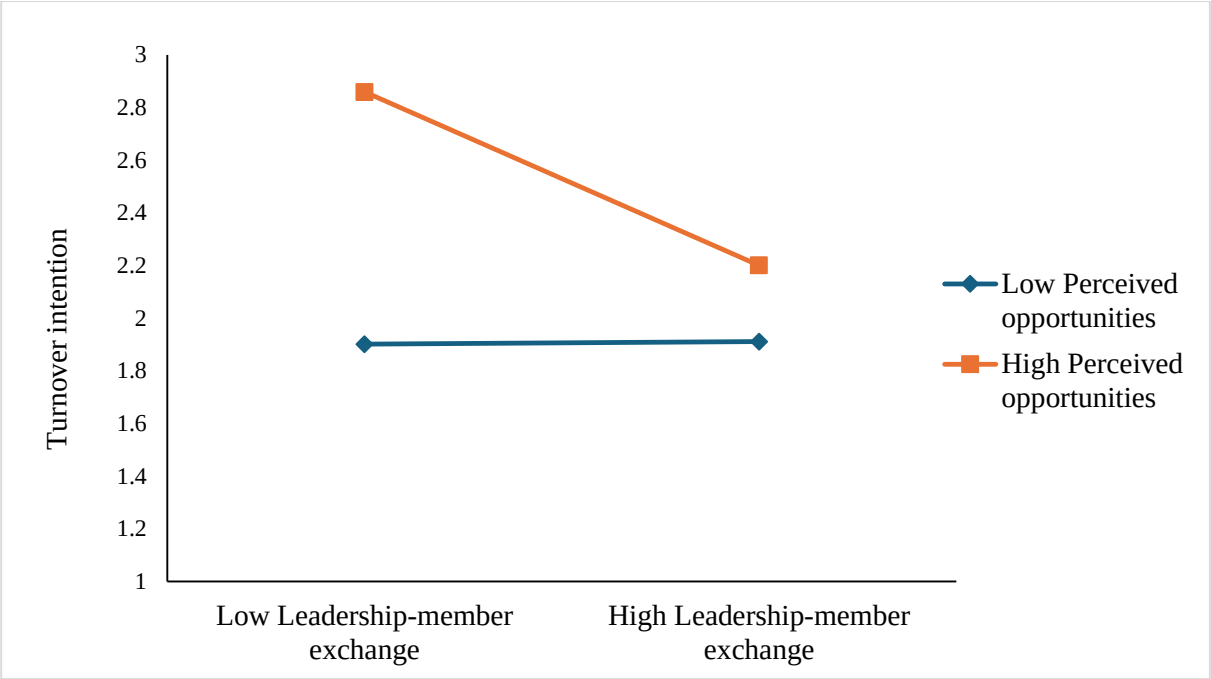

Figure 5.2 Interaction between leadership-member exchange and perceived opportunities in predicting turnover intention

5.5.2 To validate the moderating effect of PO on the relationship between JE, JS, and TI

Table 5.3 presents the results of the moderating effect analysis of PO.

Observation of model M4:

Table 5.3 Results of analytics for testing the moderation effects of perceived opportunities

	JS			TI		
	M3			M4		
	Coeff	*SE*	*t*	Coeff	*SE*	*t*
Constant	0.004	0.177	0.023	2.112	0.218	9.714
Gender	0.070	0.080	0.868	0.056	0.099	0.568
Age	-0.074	0.073	-1.005	-0.153	0.090	-1.696
Length of service	0.018	0.071	0.259	0.008	0.087	0.094
JE	0.559	0.047	12.005***	-0.222	0.072	-3.099**
JS				-0.334	0.068	-4.886***
PO				0.283	0.054	5.205***
JE × PO				-0.209	0.070	-2.989**
JS × PO				0.189	0.073	2.590**
R^2		0.310			0.347	
F		37.440***			21.846***	

Note. **$p < 0.01$, ***$p < 0.001$

The regression model explains 34.7% ($R^2 = 0.347$) of the variance in the dependent variable (TI), indicating good overall significance of the regression model ($F = 21.846$, $p < 0.001$). The standardized coefficient between JE and TI is $\beta = -0.222$, while the coefficient for the interaction term "JE×PO" with the dependent variable TI is $\beta_{int\text{-}1} = -0.209$, both statistically significant ($p < 0.001$). Additionally, the standardized coefficient between JS and TI is $\beta = -0.334$ ($p < 0.001$),

and the coefficient for the interaction term "JS×PO" with the dependent variable TI is $\beta_{int\text{-}2}$ = 0.189 (p < 0.01), also statistically significant. These results suggest that PO negatively moderates the negative direct effect between JE and TI while positively moderating the negative direct effect between JS and TI.

A simple slope test was conducted by plotting simple slope graphs to validate further the moderating effects identified through path analysis. Figures 5.3 and 5.4 present the simple slope graphs. The results indicate that when PO is high, JE negatively affects TI (β = -0.4194, t = -4.8222, p < 0.001). However, when PO is low, JE's influence on TI is insignificant (β = -0.0238, t = -0.2225, n.s.). Therefore, evidence of a moderation effect indicates that as PO increases, the predictive power of JE on TI gradually strengthens.

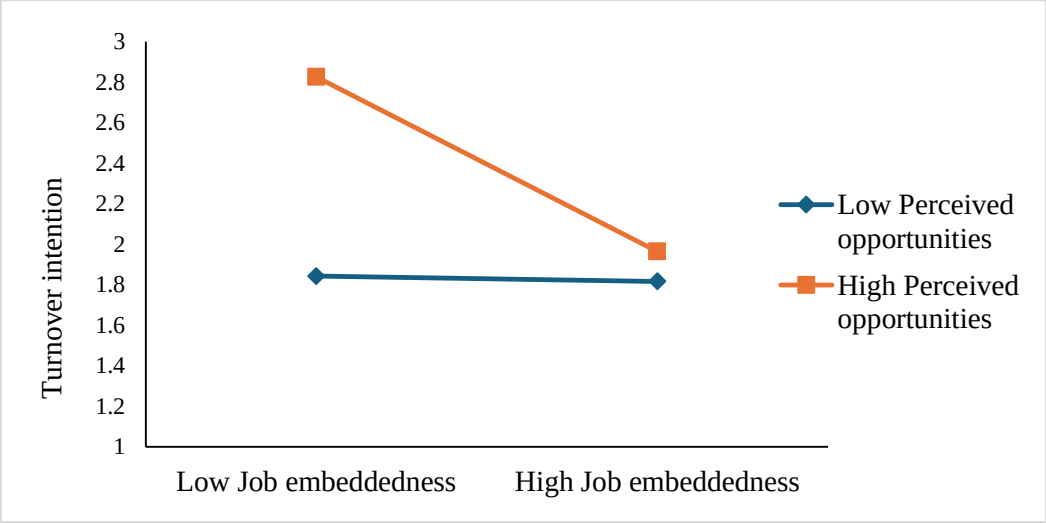

Figure 5.3 Interaction between job embeddedness and perceived opportunities in predicting turnover intention

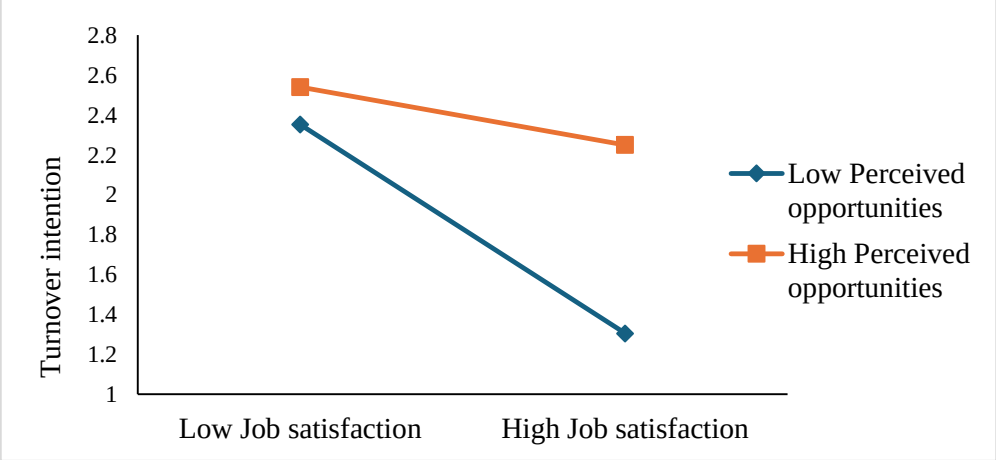

Figure 5.4 Interaction between job satisfaction and perceived opportunities in predicting turnover intention

On the other hand, when PO is low, JS negatively affects TI (β = -0.5122, t = -4.9312, p <

0.001). However, when PO is high, JS's influence on TI is insignificant (β = -0.1555, t = -1.7356, n.s.). This also suggests a moderation effect, indicating that as PO increases, the predictive power of JS on TI gradually weakens.

5.5.3 Verifying the moderating effect of CS

Since our factor analysis revealed that CS consists of two dimensions, PCS and NCS, we conducted the moderation effect test of CS in two parts: PCS and NCS.

To validate the moderating effect of PCS on the relationship between LMX, JS, and TI. Table 5.4 presents the results of the PCS moderating effect analysis.

Table 5.4 Results of analytics for testing the moderation effects of positive career shocks

	JS			TI		
	M5			M6		
	Coeff	*SE*	*t*	Coeff	*SE*	*t*
Constant	-0.299	0.184	-1.625	2.263	0.229	9.877
Gender	0.084	0.085	0.990	0.013	0.104	0.124
Age	0.119	0.079	1.502	-0.192	0.098	-1.963
Length of service	-0.050	0.076	-0.651	0.010	0.093	0.112
LMX	0.513	0.052	9.913***	-0.160	0.073	-2.190*
JS				-0.453	0.069	-6.570***
PCS				0.101	0.045	2.261*
LMX × PCS				-0.173	0.062	-2.783**
JS × PCS				0.225	0.058	3.888***
R^2		0.237			0.275	
F		25.839***			15.605***	

Note. *p < 0.05, **p < 0.01, ***p < 0.001

Observation of model M6:

The regression model explains 27.5% (R^2 = 0.275) of the variance in the dependent variable (TI), again indicating good overall significance (F = 15.605, p < 0.001). The standardized coefficient between LMX and TI is β = -0.160 (p < 0.05), while the coefficient for the interaction term "LMX×PCS" with the dependent variable TI is $\beta_{int\text{-}2}$ = -0.173 (p < 0.01), both statistically significant. Additionally, the standardized coefficient between JS and TI is β = -0.453 (p < 0.001), and the coefficient for the interaction term "JS×PCS" with the dependent variable TI is $\beta_{int\text{-}3}$ = 0.225 (p < 0.001), also statistically significant. These results suggest that PCS negatively moderates the negative direct effect between LMX and TI, and positively moderates the negative direct effect between JS and TI.

Simple slope tests were conducted by plotting simple slope graphs reported in Figures 5.5 and 5.6 to validate the moderating effects identified through the path analysis further. The results indicate that when PCS is high, LMX negatively affects TI (β = -0.3481, t = -3.6543, p < 0.001). However, when PCS is low, the influence of LMX on TI is insignificant (β = 0.0288,

t = 0.2778, n.s.). This suggests a moderation effect, indicating that as PCS increases, the predictive power of LMX on TI gradually strengthens.

On the other hand, when PCS is high, JS negatively affects TI (β = -0.2072, t = -2.2127, p < 0.001). However, when PCS is low, JS also negatively affects TI (β = -0.6978, t = -7.4883, p < 0.001) but with a more substantial predictive effect. This indicates that as PCS increases, the predictive power of JS on TI gradually diminishes.

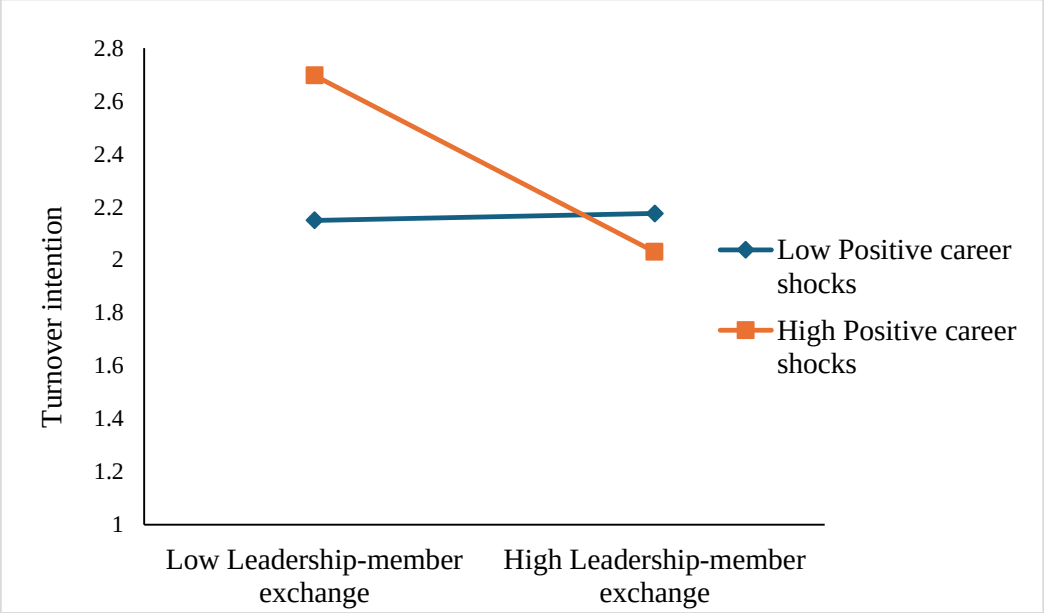

Figure 5.5 Interaction between leadership-member exchange and positive career shocks in predicting turnover intention

Figure 5.6 Interaction between job satisfaction and positive career shocks in predicting turnover intention

To verify the moderating effect of PCS on the relationship between JE, JS, and TI. Table 5.5 reports the results of the PCS moderating effect analysis.

Table 5.5 Results of analytics for testing the moderation effects of positive career shocks

	JS			TI		
	M7			M8		
	Coeff	*SE*	*t*	Coeff	*SE*	*t*
Constant	0.004	0.177	0.023	2.101	0.225	9.346
Gender	0.070	0.080	0.868	0.015	0.102	0.150
Age	-0.074	0.073	-1.005	-0.124	0.093	-1.329
Length of service	0.018	0.071	0.259	0.012	0.089	0.134
JE	0.559	0.047	12.005***	-0.331	0.070	-4.699***
JS				-0.343	0.070	-4.885***
PCS				0.101	0.043	2.327*
JE × PCS				-0.162	0.057	-2.846**
JS × PCS				0.237	0.059	4.043***
R^2		0.310			0.310	
F		37.440***			18.515***	

Note. *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

Observation of model M8:

The regression model explains 31.0% ($R^2 = 0.310$) of the variance in the dependent variable (TI), demonstrating good overall significance ($F = 18.515$, $p < 0.001$). The standardized coefficient between JE and TI is $\beta = -0.331$ ($p < 0.001$), while the coefficient for the interaction term "JE×PCS" with the dependent variable TI is $\beta_{int\text{-}1} = -0.162$ ($p < 0.01$), both statistically significant. Additionally, the standardized coefficient between JS and TI is $\beta = -0.343$, and the coefficient for the interaction term "JS×PCS" with the dependent variable TI is $\beta_{int\text{-}2} = 0.237$, also statistically significant ($p < 0.001$). These results suggest that PCS negatively moderates the negative direct effect between JE and TI while positively moderating the negative direct effect between JS and TI.

Simple slope tests were conducted by plotting simple slope graphs reported in Figures 5.7 and 5.8 to validate further the moderating effects identified through the path analysis. The results indicate that when PCS is high, JE negatively affects TI ($\beta = -0.5072$, $t = -5.5103$, $p < 0.001$). However, when PCS is low, the predictive effect of JE on TI is insignificant ($\beta = -0.1539$, $t = -1.6108$, n.s.). This suggests a moderation effect, indicating that as PCS increases, the predictive power of JE on TI gradually strengthens.

On the other hand, when PCS is low, JS negatively affects TI ($\beta = -0.6011$, $t = -6.4012$, $p < 0.001$). However, when PCS is high, JS's effect on TI is insignificant ($\beta = -0.0848$, $t = -1.7356$, n.s.). This also suggests a moderation effect, indicating that as PCS increases, the predictive power of JS on TI gradually diminishes.

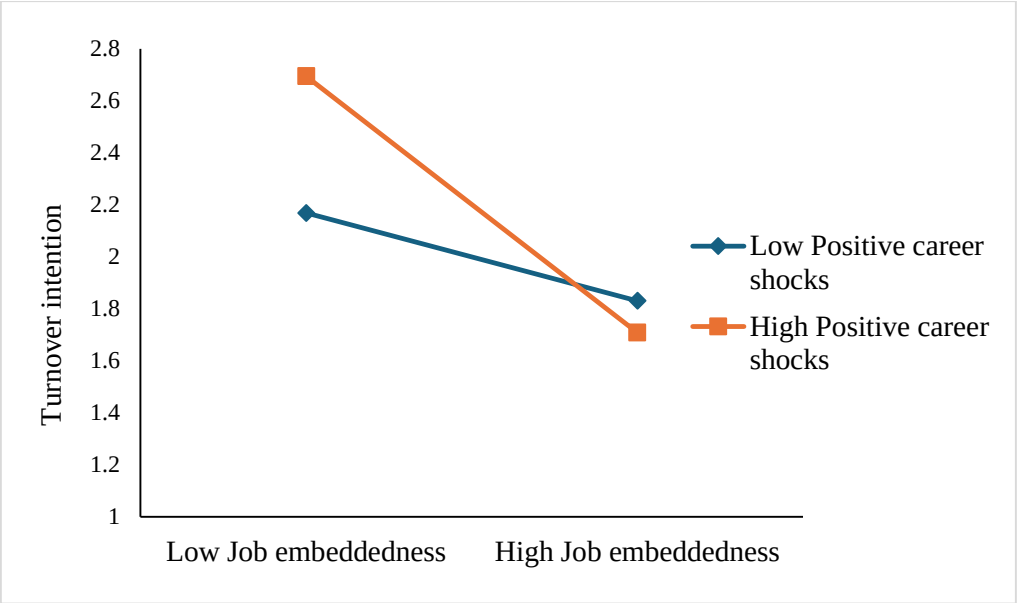

Figure 5.7 Interaction between job embeddedness and positive career shocks in predicting turnover intention

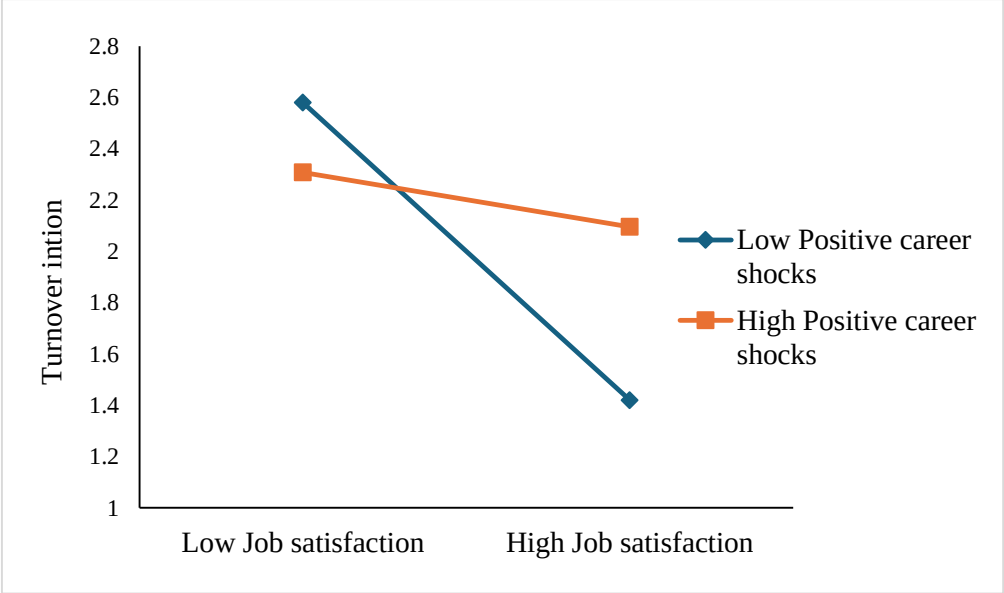

Figure 5.8 Interaction between job satisfaction and positive career shocks in predicting turnover intention

To verify the moderating effect of NCS on the relationship between LMX, JS, and TI. The results of the NCS moderating effect analysis are reported in Table 5.6.

Observation of model M10:

The regression model explains 29.2% ($R^2 = 0.292$) of the variance in the dependent variable (TI), demonstrating good overall significance ($F = 16.918$, $p < 0.001$). The standardized coefficient between LMX and TI) is $\beta = -0.182$ ($p < 0.05$), while the coefficient for the interaction term "LMX×NCS" with the dependent variable TI is $\beta_{int\text{-}1} = -0.181$ ($p < 0.01$), both

statistically significant. Additionally, the standardized coefficient between JS and TI is β = -0.376, and the coefficient for the interaction term "JS×NCS" with the dependent variable TI is $\beta_{int\text{-}2}$ = 0.189 (p < 0.01), also statistically significant. These results suggest that NCS negatively moderates the negative direct effect between LMX and TI while positively moderating the negative direct effect between JS and TI.

Table 5.6 Results of analytics for testing the moderation effects of negative career shocks

	JS			TI		
		M9			M10	
	Coeff	*SE*	*t*	Coeff	*SE*	*t*
Constant	-0.299	0.184	-1.625	2.290	0.225	10.168
Gender	0.084	0.084	0.990	0.027	0.103	0.260
Age	0.118	0.079	1.502	-0.198	0.097	-2.054*
Length of service	-0.049	0.076	-0.651	0.005	0.092	0.052
LMX	0.513	0.052	9.912***	-0.182	0.072	-2.518*
JS				-0.376	0.067	-5.613***
NCS				0.148	0.047	3.161**
LMX × NCS				-0.181	0.060	-3.019**
JS × NCS				0.189	0.058	3.274**
R^2		0.237			0.292	
F		25.839***			16.918***	

Note. *p < 0.05, **p < 0.01, ***p < 0.001

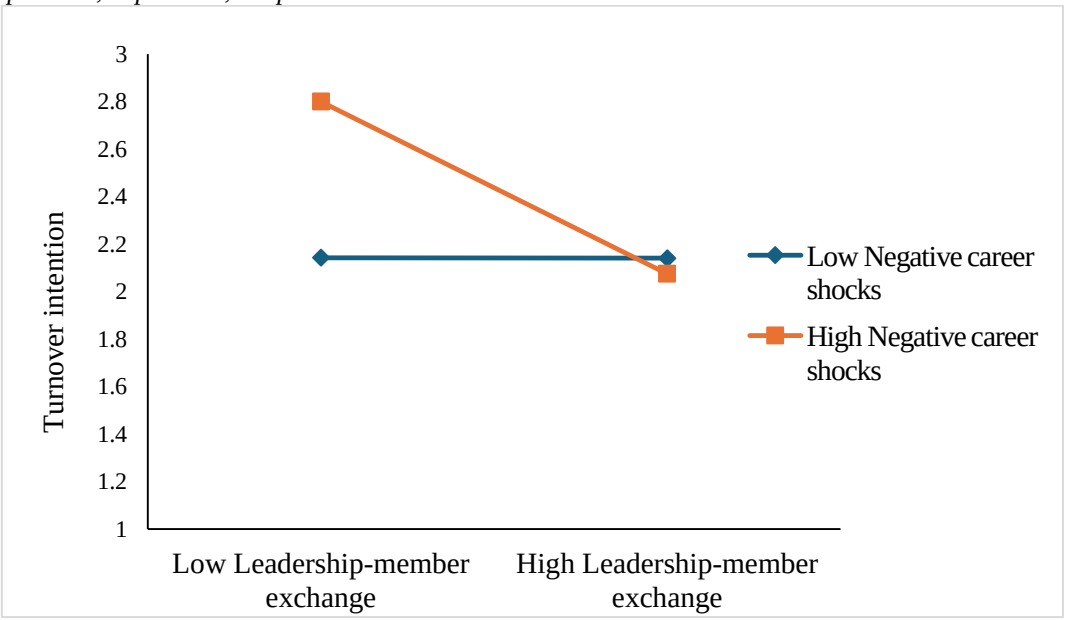

Figure 5.9 Interaction between leadership-member exchange and negative career shocks in predicting turnover intention

Simple slope tests were conducted by plotting simple slope graphs reported in Figures 5.9 and 5.10 to validate further the moderating effects identified through the path analysis. The results indicate that when NCS is high, LMX negatively affects TI (β = -0.3788, t = -3.7697, p < 0.001). However, when NCS is low, the effect of LMX on TI is insignificant (β = 0.0152, t = 0.1619, n.s.). This suggests a moderation effect, indicating that as NCS increases, the predictive

power of LMX on TI gradually strengthens.

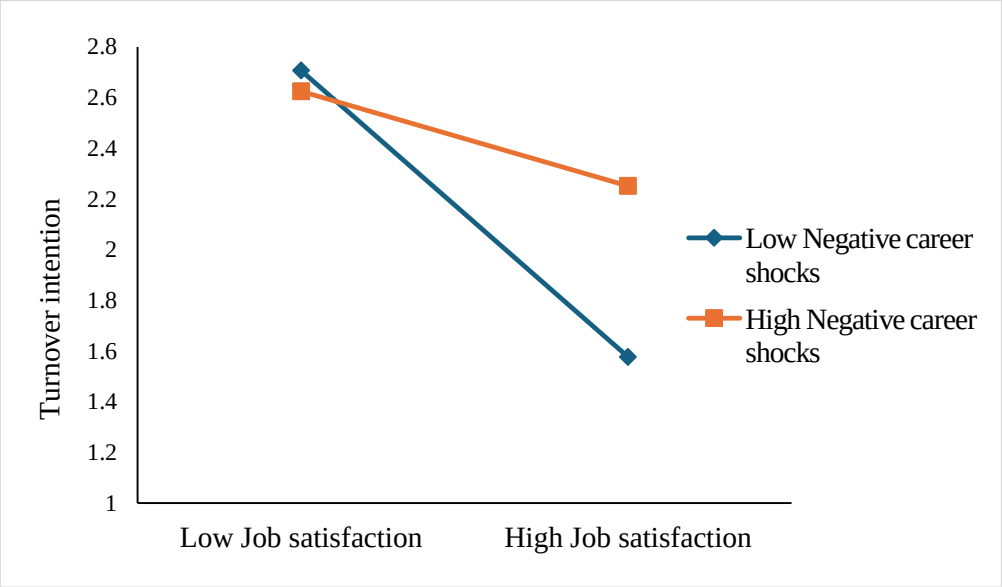

Figure 5.10 Interaction between job satisfaction and negative career shocks in predicting turnover intention

On the other hand, when NCS is low, JS negatively affects TI (β = -0.5818, t = -6.3708, p < 0.001). However, when NCS is high, JS's effect on TI is insignificant (β = -0.1697, t = -1.8361, n.s.). This also suggests a moderation effect, indicating that as NCS increases, the predictive power of JS on TI gradually diminishes.

To verify the moderating effect of NCS on the relationship between JE, JS, and TI. The results of the NCS moderating effect analysis are reported in Table 5.7.

Table 5.7 Results of analytics for testing the moderation effects of negative career shocks

	JS			TI		
		M11			M12	
	Coeff	*SE*	*t*	Coeff	*SE*	*t*
Constant	0.004	0.177	0.023	2.103	0.222	9.461
Gender	0.070	0.080	0.868	0.036	0.101	0.355
Age	-0.074	0.073	-1.005	-0.113	0.093	-1.222
Length of service	0.018	0.071	0.259	-0.004	0.089	-0.050
JE	0.559	0.047	12.005***	-0.316	0.070	-4.523***
JS				-0.292	0.069	-4.240***
NCS				0.153	0.046	3.331***
JE × NCS				-0.184	0.061	-3.040**
JS × NCS				0.196	0.058	3.376***
R^2		0.310			0.322	
F		37.440***			19.564***	

Note. **p<0.01, ***p<0.001

Observation of model M12:

The regression model explains 32.2% (R^2 = 0.322) of the variance in the dependent variable (TI), with good overall significance (F = 19.564, p < 0.001). The standardized coefficient

between JE and TI is β = -0.316 (p < 0.001), and the coefficient for the interaction term "JE×NCS" with the dependent variable TI is $\beta_{int\text{-}1}$ = -0.184 (p < 0.01), both statistically significant. Additionally, the standardized coefficient between JS and TI is β = -0.292, and the coefficient for the interaction term "JS×NCS" with the dependent variable TI is $\beta_{int\text{-}2}$ = 0.196, also statistically significant (p < 0.001). These results suggest that NCS negatively moderates the negative direct effect between JE and TI and the positive direct effect between JS and TI. However, there seems to be a contradiction in the moderation effect between JS and TI, as the coefficient $\beta_{int\text{-}2}$ indicates a positive moderation while the text describes it as negative moderation. This might be a typographical error, and it should be clarified whether the moderation is positive or negative based on the actual data and context.

Simple slope tests were conducted by plotting simple slope graphs reported in Figures 5.11 and 5.12 to validate the moderating effects identified through the path analysis further. The results indicate that when NCS is high, JE negatively affects TI (β = -0.5175, t = -5.4207, p < 0.001). However, when NCS is low, the effect of JE on TI is insignificant (β = -0.1152, t = -1.1872, n.s.). This suggests a moderation effect, indicating that as NCS increases, the predictive power of JE on TI gradually strengthens.

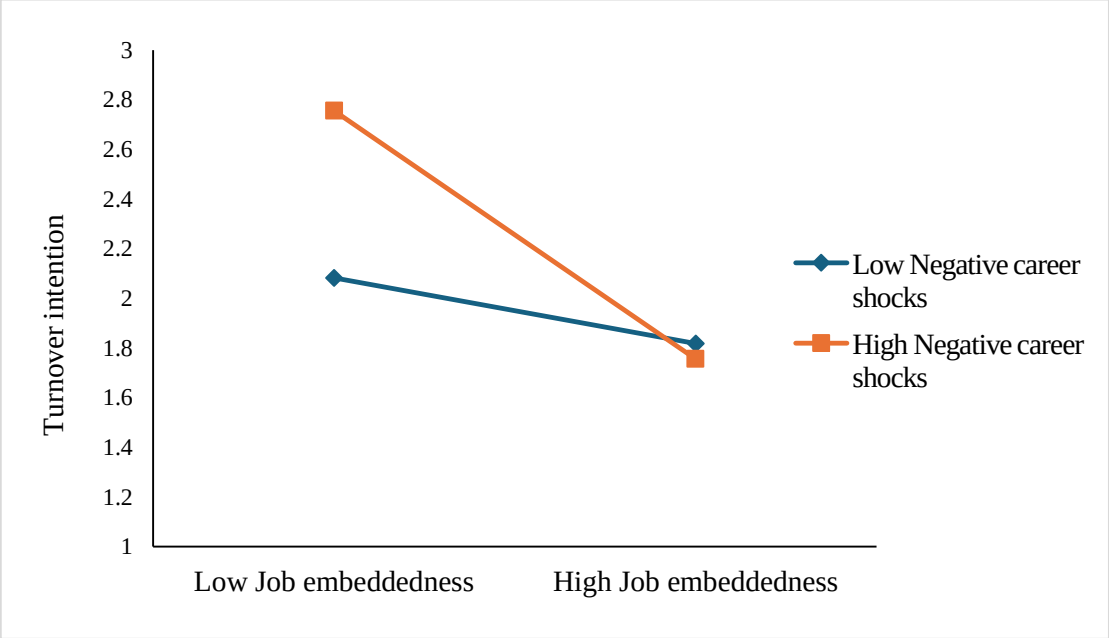

Figure 5.11 Interaction between job embeddedness and negative career shocks in predicting turnover intention

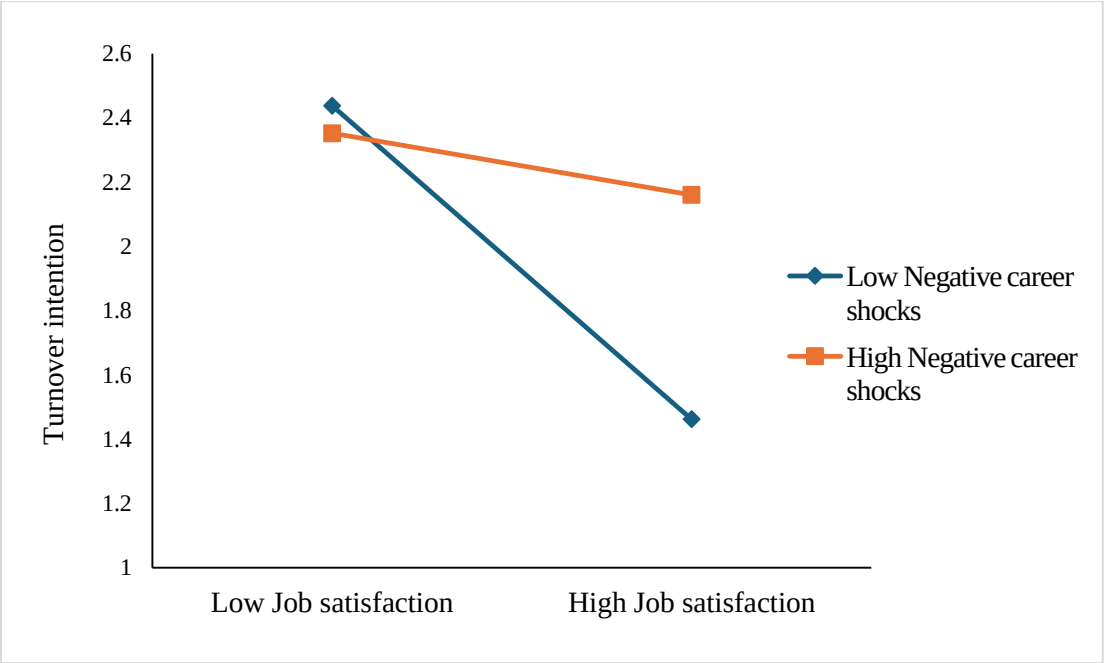

Figure 5.12 Interaction between job satisfaction and negative career shocks in predicting turnover intention

On the other hand, when NCS is low, JS negatively affects TI (β = -0.5065, t = -5.3388, p < 0.001). However, when NCS is high, JS's effect on TI is insignificant (β = -0.0782, t = -0.8456, n.s.). This also suggests a moderation effect, indicating that as NCS increases, the predictive power of JS on TI gradually diminishes.

5.6 Results and discussion

Based on the theories of LMX and JE, this study introduced the moderating variables of PO, PCS, and NCS, exploring the impact of LMX, Job Embeddedness, and JS on TI, as well as the moderating effects of PO, PCS, and NCS on these relationships. Six research hypotheses were tested, and the results consistently found that: (1) PO moderates the relationship between LMX and TI, and as the level of PO increases, the predictive effect of LMX on TI gradually strengthens. (2) PO moderates the relationship between JE and TI; as the level of PO increases, the predictive effect of JE on TI gradually strengthens. (3) PO moderates the relationship between JS and TI, and as the level of PO increases, the predictive effect of JS on TI gradually weakens. (4) PCS moderates the relationship between LMX and TI, and as the level of PCS increases, the predictive effect of LMX on TI gradually strengthens. (5) PCS moderates the relationship between JE and TI, and as the level of PCS increases, the predictive effect of JE on TI gradually strengthens. (6) PCS moderates the relationship between JS and TI, and as the level of PCS increases, the predictive effect of JS on TI gradually weakens. (7) NCS moderates

the relationship between LMX and TI, and as the level of NCS increases, the predictive effect of LMX on TI gradually strengthens. (8) NCS moderates the relationship between JS and TI, and as the level of NCS increases, the predictive effect of JS on TI gradually weakens. (9) NCS moderates the relationship between JE and TI; as the level of NCS increases, the predictive effect of JE on TI gradually strengthens.

5.6.1 PO as a moderator between LMX, JE, JS, and TI

Perceived opportunity, as an essential career psychological variable, describes employees' cognition and evaluation of other job opportunities available in the market. Perceived job opportunities are often contextual factors affecting turnover rates or intentions (Rusbult & Farrell, 1983). This perception not only depends on the actual job market conditions but is also influenced by personal expectations, career aspirations, and satisfaction with current jobs. The results of this study show that PO plays a moderating role in the relationship between LMX and TI, JE and TI, and JS and TI. Meanwhile, some empirical studies have also confirmed the moderating effect of PO (Lu et al., 2016; Qian et al., 2015; Rasheed et al., 2020).

Based on previous research findings, the level of PO may alter the strength and direction of these relationships, where JE and JS affect TI. Specifically, even if employees feel embedded in their current position and have high satisfaction, their TI may still increase if they perceive more and better job opportunities externally. This is because perceived external opportunities may stimulate employees' desire for career development, prompting them to consider more attractive career paths, even if they are relatively satisfied with their current job.

In summary, PO is a multidimensional concept that can moderate the relationship between employees' JE, JS, and TI. Organizations should consider the impact of PO on management practices and adopt corresponding strategies to maintain employee loyalty and reduce talent turnover. Strategies such as providing internal career development opportunities, enhancing JE through organizational culture and social support, and regularly communicating with employees about their career aspirations and market opportunities can help organizations retain talent and promote overall stability and performance.

5.6.2 The moderating role of CS in the relationship between LMX, JE, JS, and TI

This study employs empirical research methods to delve into the moderating effects of CS on the relationship between LMX, JE, JS, and TI. CS refers to unexpected events or information encountered by individuals in their professional careers, which may significantly impact their

career attitudes and behaviors. Career shocks can be further categorized as positive or negative depending on their influence on employees.

PCS may include unexpected promotion opportunities, acquiring responsibility for important projects, or receiving positive career feedback. These positive shocks may enhance employees' trust in leadership and commitment to the organization, negatively moderating the relationship between LMX, JE, JS, and TI. Specifically, PCS makes employees feel that their efforts have been recognized and rewarded, increasing their JE and JS within the current organization and reducing TI.

On the other hand, NCS, such as being overlooked for promotions, project failures, or experiencing unfair treatment, may weaken employees' trust in leadership and commitment to the organization, negatively moderating the relationship between LMX, JE, JS, and TI. These negative shocks may lead employees to reevaluate their career goals and loyalty to the organization, increasing the likelihood of turnover.

In conclusion, whether positive or negative, CS significantly moderates the relationship between LMX, JE, JS, and TI. Organizations should be aware of the potential impact of CS on employee attitudes and behaviors and take proactive measures to mitigate their negative effects and leverage their positive ones. By doing so, organizations can enhance employee retention, promote stability, and improve performance.

5.6.3 The moderating role of PCS in the relationship between JE and JS

This study employs empirical research methods to explore the moderating effect of CS on the relationship between JE and JS. The findings reveal an interesting phenomenon: PCS, such as unexpected promotion opportunities or acquiring significant project authorizations, can significantly enhance the satisfaction of employees who already feel embedded in their work. This suggests that PCS can amplify employees' positive emotions and evaluations of their jobs, further elevating JS beyond their existing levels of JE.

However, in contrast to PCS, the moderating effect of NCS, such as encountering career setbacks or unfair treatment, on JS is not as pronounced among employees with solid JE. This may imply that when employees have a strong sense of attachment to their work, they may exhibit better psychological resilience against negative events or adopt positive strategies to mitigate the impact of negative shocks. In other words, NCS may not significantly reduce their JS for those deeply connected to their work.

Through these analyses, the study provides deeper insights into understanding the complex influence of CS. It offers strategies for organizations to assist employees in better coping with

unpredictable events in their careers. This can help maintain and enhance JS levels within the workforce.

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Chapter 6: Conclusion

The main objective of this chapter is to provide a detailed interpretation of the critical findings obtained through empirical analysis in this study to deepen our understanding of the phenomenon of TI among medical staff in public hospitals in Guangzhou. Firstly, we have conducted an in-depth analysis of survey data collected from medical staff in Guangzhou public hospitals, revealing a multitude of factors that influence their TI, including the quality of leader-member relationships, the degree of JE, the level of JS, and the moderating effect of individuals' perception of career opportunities and shocks on TI. Secondly, this chapter will explore the contributions of this study to the existing theoretical framework. In the specific context of public hospitals, we offer new perspectives and insights for understanding medical staff's work attitudes and behaviors. Meanwhile, this chapter will also address the management of TI among medical staff in Guangzhou public hospitals, proposing practical recommendations based on the research findings. These recommendations aim to assist hospital administrators in formulating more effective human resource strategies to reduce the loss of outstanding medical staff and enhance employee JS and loyalty. Finally, this chapter will discuss the limitations of this study and suggest possible directions for future research.

6.1 Main research conclusions

Amidst the Chinese government's current push for high-quality development in public hospitals, human resource management, particularly the stability and growth of talent, has emerged as a core issue in hospital administration. Talent is the primary resource driving hospital development and the key to ensuring medical service quality and hospital competitiveness. As such, public hospitals attach great importance to the cultivation and development of talent, viewing it as the cornerstone of high-quality development.

Although reasonable talent turnover plays a positive role in knowledge renewal and team vitality, excessive talent loss can increase hospital human resource costs and affect the hospital's stable operation and service quality. Therefore, as hospital administrators, having a deep understanding of and effectively addressing talent loss is crucial to ensuring the stable development of the talent team.

This study aims to explore the factors that influence the TI of medical staff in public hospitals and seek effective strategies to reduce talent loss. Based on extensive literature research, the study adopts theoretical perspectives such as LMX, JS, and JE to investigate how these factors affect medical staff TI. Additionally, this study considers two moderating variables, CS and PO, to analyze how they influence the strength of the relationships between LMX, JE, JS, and TI.

The study collected 338 valid data points through a carefully designed questionnaire survey and empirically tested the research model and hypotheses. The results revealed exciting findings: Higher-quality LMX leads to lower employee TI. A stronger sense of JE is associated with lower TI. Employees with higher JS also have relatively lower TI.

Furthermore, JS fully mediates the relationship between LMX and TI and partially mediates the relationship between JE and TI.

The study also found that PO can moderate the relationships between LMX, JE, and TI. When employees perceive more career development opportunities, these relationships are strengthened. PCS and NCS can enhance the relationships between LMX, JE, and TI while weakening the relationship between JS and TI.

In summary, this study provides empirical evidence for public hospital administrators to reduce talent loss and offers new perspectives and research directions for future studies. By deeply understanding and addressing the factors that influence medical staff's TI, public hospitals can more effectively ensure the stable development of their talent teams, thereby promoting the overall high-quality development of the hospital.

6.2 Theoretical contributions

This study focuses on the medical staff of public hospitals in Guangzhou as the research subjects, aiming to delve into the complex relationships between LMX, JE, JS, and TI. The theoretical contributions of the study are mainly reflected in the following four aspects:

Firstly, this study verifies the turnover theories by focusing on the impacts of LMX and JE on employees' turnover intention. Specifically, it supports the viewpoints of scholars such as Hom (1995), Griffeth (2000), and Maertz and Campion (1998), which suggest that traditional attitudinal variables like JS and organizational commitment have limitations in explaining employee turnover. Through empirical research, we provide new evidence for this argument.

Secondly, this study reveals the mediating role of JS in the relationships between LMX, JE, and TI. This finding deepens our understanding of the processes through which LMX and JE

affect TI, providing new evidence for previous studies (Han & Jekel, 2011; Jin et al., 2018; C. Wang et al., 2020).

Thirdly, in China's unique economic and cultural context, this study validates the LMX and JE theories cross-cultural (Deng et al., 2017; Yang, 2013). By considering the uniqueness of Chinese society and the particularity of the medical profession, our research not only enriches the existing theoretical system but also lays a solid foundation for empirical research on the localization of LMX theory and JE theory.

Lastly, this study innovatively introduces CS and PO as moderating variables, which are uncommon perspectives in previous studies. By examining the predictive effects of LMX, JE, and JS on employees' TI in specific contexts of CS and PO, our research shows that this contextualized prediction is more accurate than models that do not consider situational factors, thereby enhancing the stability of turnover theory.

6.3 Management suggestions

TI is a frequently discussed issue in management studies. Through a questionnaire survey of medical staff in public hospitals in Guangzhou, this study explored the relationships between LMX, JE, JS, and TI. Innovatively, JS was introduced as a mediator variable, while the research model incorporated CS and PO as moderator variables. Based on the results of the empirical analysis, we offer the following management suggestions for public hospitals to stabilize their talent pool and contribute to high-quality development.

6.3.1 Cultivating a positive organizational culture and reinforcing employees' Identification with it

The empirical analysis reveals a significant phenomenon: JE and JS play crucial roles in the careers of medical staff. They directly impact individuals' TI and serve as vital determinants for employees to stay in healthcare institutions over the long term. JE refers to the degree of an employee's investment in their work role, encompassing their passion, focus, and loyalty towards their profession. On the other hand, JS is employees' overall feeling towards their working conditions, environment, compensation, colleague relationships, and personal growth opportunities. When satisfied in these areas, employees are more likely to demonstrate higher job engagement, reducing the likelihood of turnover.

Within this framework, hospital culture emerges as a non-negligible variable. Hospital culture refers to a healthcare institution's shared values, beliefs, behavioral norms, and work

atmosphere. This culture profoundly influences employees' behavioral patterns and psychological states, indirectly affecting JE and satisfaction. A positive hospital culture can stimulate employees' potential and enhance their enthusiasm and loyalty towards work, while a negative culture may lead to low morale and increase turnover risk.

Therefore, healthcare institutions should adopt various measures to cultivate and reinforce a positive organizational culture. Organizational activities, such as team-building events and social gatherings, can foster mutual understanding and trust among employees, establishing a sense of team spirit and collaborative atmosphere. Regular training can enhance employees' professional skills and reinforce organizational identification by emphasizing the institution's core values and vision. Effective communication strategies, including open feedback mechanisms and transparent decision-making processes, can ensure that employees feel heard and understand the importance of their work in achieving organizational goals.

Through these measures, healthcare institutions can create a supportive and inspiring work environment where an advanced culture encourages employees to pursue excellence, and a warm culture strengthens cohesion among them. As employees' sense of belonging and identification grows, they are more likely to grow and face challenges with the healthcare institution.

Through cultural development, healthcare institutions can form a solid cultural consensus based on shared values and a sense of mission. This consensus can inspire employees' enthusiasm and loyalty, ensuring they understand how their work connects to the organization's goals. This enhances job identification and promotes a more profound sense of meaning and fulfillment in their work. This profound career satisfaction is critical to maintaining long-term employee stability and reducing turnover rates.

6.3.2 Enhancing teamwork and support among healthcare professionals to improve collaboration

The nature of healthcare professionals' work is highly collaborative and interdependent. When doctors perform diagnostic and treatment tasks, they rely on a multidisciplinary team, including nurses, technicians, administrators, and others, to jointly provide patient care and treatment. Collaboration and support among team members are crucial for delivering high-quality healthcare services. Therefore, doctors' efficiency and effectiveness are closely linked to the support they receive from the team.

Improving the work environment is essential for enhancing the tacit understanding among healthcare teams. A favorable work environment fosters communication among team members,

reduces misunderstandings and conflicts, and ultimately enhances the team's overall efficiency and JS. Furthermore, their JE strengthens when healthcare professionals feel that their efforts are recognized and the work environment supports their professional development. They become more engaged in their work, demonstrating stronger loyalty and a sense of belonging to their organization.

Healthcare institutions should cultivate a cultural consensus through organizational culture development, encompassing shared values, goals, and work standards. Such a cultural consensus promotes trust and support among medical team members, with each member understanding the team's shared objectives and working towards achieving them. Reinforcing this consensus enables team members to collaborate more effectively and handle challenges in their daily work.

To create a supportive and inclusive work environment, healthcare institutions need to take measures to foster positive relationships and strengthen social connections among employees. These may include team-building activities, regular meetings, and open communication channels. These measures contribute to a supportive work atmosphere where every member feels like an integral part of the team and can rely on its support during difficult times.

Additionally, healthcare institutions should focus on individual healthcare professionals' career development and personal needs. Providing opportunities for continuous education and professional training and ensuring reasonable workloads and work schedules are significant factors in enhancing JS and reducing TI.

In summary, healthcare institutions can significantly enhance the JE and satisfaction of their healthcare professionals by improving the work environment, cultivating a positive organizational culture, fostering team collaboration and support, and attending to employees' personal development. This, in turn, leads to improved healthcare service quality, reduced employee turnover, and ultimately, the long-term stable development of the healthcare institution.

6.3.3 Strengthening leaders' role perception to promote fair and equitable management

Through empirical analysis, we have found that LMX plays a crucial role in healthcare institutions. LMX describes the quality of the relationship between a leader and their team members, which directly impacts employee JS and further influences the TI of healthcare professionals. In healthcare settings, leaders are often clinicians or technically trained professionals who may need more training in management skills.

To enhance these leaders' management capabilities, healthcare institutions should invest in training and development programs focused on improving leaders' communication skills, emotional intelligence, and team management abilities. Communication skills are essential for ensuring clear information flow and avoiding misunderstandings. Emotional intelligence enables leaders to understand and manage their emotions better and recognize and influence team members' emotions. Team management abilities involve motivating team members, coordinating work within the team, and handling conflicts.

Leaders should also be aware of their pivotal role in management, particularly in building trusting and supportive relationships. Through such relationships, leaders can help employees overcome professional challenges, increasing their job engagement and sense of belonging. Additionally, ensuring transparency and fairness in decision-making, resource allocation, and promotion opportunities is vital for maintaining employee trust and satisfaction.

Leaders should recognize employee differences and attempt to meet their varying needs and expectations through personalized interactions. This individualized approach can include tailored career development plans, flexible work arrangements, or task assignments that align with personal interests and strengths. Adopting this personalized management style makes employees feel valued and understood, improving JS.

In summary, by enhancing the quality of LMX, healthcare institutions can significantly increase employee satisfaction and loyalty, reduce turnover rates, and ensure the stability of their talent pool. This improves the quality and efficiency of healthcare services and promotes the institution's overall development and competitiveness.

6.3.4 Providing career development opportunities and focusing on employee personal growth

Offering training and development opportunities is a crucial strategy for healthcare institutions to maintain the loyalty and competitiveness of their medical staff. Especially for healthcare professionals, enhancing their technical expertise improves their diagnostic and treatment skills and enables them to provide more specialized care. Through these opportunities, medical staff can continually upgrade their skills, achieve personal career goals, and drive innovation and growth for the institution. Training programs should encompass various areas, from technical skills to soft skills, including leadership development, team collaboration, time management, conflict resolution, and more, to ensure comprehensive growth for the medical staff.

Furthermore, by providing career advancement opportunities such as promotional pathways, opportunities for lateral job transitions, or involvement in significant projects,

healthcare professionals can perceive a larger platform for development and broader career prospects within the hospital or department. This way, even if they are aware of external job opportunities, they may choose to stay due to the promising growth prospects within their current organization. Such a strategy aids in retaining key talent and reduces the costs associated with recruiting and training new employees.

Additionally, hospitals must focus on the personal development of their employees and offer compensation packages that align with their expected contributions. This includes base salaries, performance bonuses, and benefit plans to ensure healthcare professionals' efforts are rewarded. Moreover, hospitals should implement employee leave policies that facilitate a better work-life balance. A culture that promotes such a balance can significantly enhance employee satisfaction and JE.

Ultimately, through these comprehensive measures, the JS and JE of healthcare professionals will increase, reducing their TI. Feeling a sense of growth within their roles, recognition for their contributions, and the ability to balance work and home life will motivate medical staff to commit to longer-term service within the healthcare institution, contributing to its sustained success.

6.3.5 Encouraging two-way communication between leaders and members, providing timely feedback and recognition

To establish an effective communication mechanism, healthcare institutions should cultivate an open, inclusive culture that encourages medical staff to express their opinions and suggestions freely. This can be achieved through various means, such as setting up anonymous suggestion boxes, holding regular employee meetings, conducting team-building activities, and providing online platforms for staff to share their ideas whenever they wish.

Leaders play a crucial role in this process. They not only need to listen to the views of medical staff but also actively provide feedback to demonstrate that their voices are heard and valued. Such interaction enhances the sense of belonging among medical staff and fosters innovation and improvement.

Regularly providing positive feedback to medical staff about their job performance is equally important. This includes not only formal performance evaluations but also day-to-day encouragement and support. Medical staff's contributions can be recognized through public praise, awarding certificates, bonuses, or other incentives. Such recognition can significantly increase JS and loyalty among medical staff.

Timely communication and feedback help eliminate barriers and misunderstandings, fostering understanding and trust. This improves the quality of LMX and promotes harmony and collaboration within the team. When employees feel that their opinions are respected and their work is recognized, they are more likely to perceive themselves as integral parts of the team, increasing their JE.

In the high-pressure environment of healthcare institutions, such communication and recognition are particularly important. Medical professionals face significant work stress and emotional burdens, so providing a supportive environment where they feel their work is meaningful is crucial to maintaining institutional stability. Through these practices, healthcare institutions can reduce staff TI and enhance team vitality, ultimately improving the quality of patient care.

6.3.6 Emphasizing the improvement of leaders' abilities

Leaders play a crucial role in addressing employee turnover issues. Exceptional leaders are not only influential in motivating employees' enthusiasm and positivity, enhancing their sense of belonging and loyalty, but also significantly reducing their desire to leave through establishing reasonable management systems, focusing on employees' career development, providing fair incentives and rewards, and promptly addressing problems and conflicts.

Firstly, leaders establish solid communication and trust relationships with employees, deeply understand their needs and expectations, and provide adequate work guidance and support. This care makes employees feel valued and warm in the company, leading to increased engagement and reduced likelihood of turnover.

Secondly, leaders play a pivotal role in developing and implementing company management systems. They review and improve these systems to enhance employee efficiency and satisfaction. For instance, improving internal communication, increasing decision-making transparency, and clarifying promotion mechanisms all help alleviate employee dissatisfaction and disappointment, thereby reducing turnover rates.

Furthermore, leaders should prioritize employees' career development and growth. They provide training and development opportunities, assist in skill and capability enhancement, and outline clear career advancement paths. This helps employees visualize their future and growth potential within the company, leading to increased loyalty and belongingness.

When employees encounter difficulties or challenges, leaders promptly offer support and care. They are attentive to employees' welfare and mental health, providing resources and

assistance whenever necessary. This care makes employees feel the warmth and support of the company, reducing their willingness to leave.

Lastly, leaders also play a critical role in addressing employee turnover issues. They respect employees' decisions, communicate honestly, and strive to retain outstanding talent. By understanding the reasons and motivations behind an employee's departure, leaders can take targeted measures to address the issues and improve management, further reducing turnover rates.

6.4 Research limitations

This study explored the influencing factors of TI among medical staff in public hospitals in Guangzhou City, adopting a quantitative research paradigm to reveal statistical associations between relevant variables. However, some limitations inevitably exist in the design and execution of the research, providing new directions for future studies.

Firstly, regarding sample representativeness, this study selected medical staff from 12 tertiary public medical institutions in Guangzhou as research subjects. The regional scope of the study may limit the generalization ability of the research results, as these samples may only partially represent the situation of public hospitals. Future research could expand the scope to cover more medical institutions, including hospitals of different levels and sizes, as well as medical staff with different professional backgrounds, to obtain more samples and improve the universality and generalizability of the research results.

Secondly, this study employed a two-wave survey research design, a method that has been proven reliable and acceptable in previous studies (Hanappi & Buber-Ennser, 2017; Lin et al., 2016). While it's true that the two data collections may be influenced by occasional factors, the robustness of this design ensures that the data points are sufficient to provide a reasonably accurate depiction of the trends.

Thirdly, the research methodology has limitations. This study reveals correlations between variables through quantitative analysis, but it cannot provide deep insights into the subjects' behaviors, attitudes, and viewpoints, nor can it uncover the essence and inherent mechanisms of the issues, thus limiting a comprehensive understanding of the problems for managers.

6.5 Future prospects

Considering the current study's limitations, we plan to conduct further explorations in three main areas to enhance the breadth and depth of our research.

Firstly, we recognize the importance of sample diversity in generalizing research findings. Therefore, future studies will include a broader range of healthcare institutions, including those in different geographical regions, to capture regional variations. Additionally, we will consider institutions of varying sizes, from small clinics to large hospitals, to ensure that the findings apply to organizations of different scales. Moreover, we aim to include institutions with diverse cultural backgrounds to investigate how culture influences employees' communication preferences and satisfaction, thereby enhancing the transferability of our research outcomes.

Secondly, future research can employ a longitudinal research design with three or four rounds of data collection to obtain more data, thereby improving data stability and reliability, the accuracy of trend analysis, sensitivity to changes, and the effectiveness of statistical inferences. This approach will help us more accurately understand the dynamic process of the studied phenomenon and draw more reliable conclusions.

Thirdly, future research can integrate qualitative methods to gain a deeper understanding of employees' inner feelings and authentic reactions to communication mechanisms and feedback. Through in-depth interviews and focus group discussions, we can capture employees' subtle yet critical emotional and cognitive reactions during communication and feedback processes. This approach not only complements the limitations of quantitative data, but also provides richer and more detailed data, helping us construct a more comprehensive understanding framework that truly reflects the complexity of our research area.

Through these three research directions, we aim to provide more profound and comprehensive insights to inform healthcare institutions in improving employee communication, enhancing satisfaction, and reducing turnover rates. These efforts will contribute to advancing academic research in this field and provide valuable guidance for practitioners.

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Annex A: Questionnaire

Questionnaire on medical staff's feelings towards working in public hospitals in China.

Questionnaire No.:

Dear Mr./Mrs.,

Thank you very much for participating in the questionnaire survey on LMX, JE, JS, and TI among healthcare professionals. The collected data will be kept confidential and used only for academic research. Please feel free to answer all questions based on your experience and true feelings. There are no standard answers to all the questions in this questionnaire. Please check the options that represent your views. Thank you for your support and cooperation!

1. Please select the options that better describe your future relationships with your company Please select from the options using a scale of 1 to 5.

Item	Totally disagree	Disagree	Partially disagree	Agree	Completely agree
1. I basically never thought of leaving the current unit.	1	2	3	4	5
2. I plan to have a long-term career development in this unit.	1	2	3	4	5
3. I often feel tired of my current work and want to change to a new unit.	1	2	3	4	5
4. I will probably leave my current unit in the next six months.	1	2	3	4	5

2. Please select from the options reflecting your relationship with your immediate supervisor.

Item	Totally disagree	Disagree	Partially disagree	Agree	Completely agree
1. Generally speaking, I know very well whether my supervisor is satisfied with my job performance.	1	2	3	4	5
2. I think my supervisor is very aware of my problems and needs in my work.	1	2	3	4	5
3. I think my supervisor knows a lot about my potential.	1	2	3	4	5
4. My supervisor will use his authority to help me solve major work problems.	1	2	3	4	5
5. My supervisor will sacrifice my own interests to help me get out of the difficulties at work.	1	2	3	4	5
6. I trust my supervisor and support his decision-making.	1	2	3	4	5
7. I have a very good working relationship with my supervisor.	1	2	3	4	5

3. Please select from the options reflecting your relationship with your organization.

Item	Totally disagree	Disagree	Partially disagree	Agree	Completely Agree
1. I feel attached to this organization.	1	2	3	4	5
2. It would be difficult for me to leave this organization.	1	2	3	4	5
3. I'm too caught up in this organization to leave.	1	2	3	4	5
4. I feel tied to this organization.	1	2	3	4	5
5. I simply could not leave the organization that I work for.	1	2	3	4	5
6. It would be easy for me to leave this organization.	1	2	3	4	5
7. I am tightly connected to this organization.	1	2	3	4	5

4. Please select from the options reflecting your job or career satisfaction level.

Item	Totally disagree	Disagree	Partially disagree	Agree	Completely Agree
1. I am very satisfied with the opportunities for promotion within the unit.	1	2	3	4	5
2. I am very satisfied with my colleagues in the unit.	1	2	3	4	5
3. I am very satisfied with my immediate supervisor.	1	2	3	4	5
4. I am very satisfied with the work itself that I am doing.	1	2	3	4	5
5. I am very satisfied with the remuneration I receive from my unit.	1	2	3	4	5
6. Overall, I am very satisfied with my current job.	1	2	3	4	5

5. Please select from the options reflecting the significant, impactful events that caused you to consider changing your career decisions.

Item	Totally disagree	Disagree	Partially disagree	Agree	Completely Agree
1. I unexpectedly received a new job offer.	1	2	3	4	5
2. I was promoted sooner than expected.	1	2	3	4	5
3. I was unexpectedly selected for the best performance award.	1	2	3	4	5
4. I was unexpectedly selected for an advanced training program.	1	2	3	4	5
5. I unexpectedly received a salary increase.	1	2	3	4	5
6. Unexpected forced job rotation adversely affected my social relations and behavior.	1	2	3	4	5
7. Unexpected downsizing adversely affected my career path.	1	2	3	4	5
8. Clash with supervisor/coworker negatively influenced my career planning.	1	2	3	4	5
9. The unexpected departure of a mentor or colleague placed me in trouble to sustain my career.	1	2	3	4	5

6. Please select from the options reflecting your perception of the availability of alternative job opportunities.

Item	Totally disagree	Disagree	Partially disagree	Agree	Completely Agree
1. It is not difficult for me to leave this unit to find a job like this again.	1	2	3	4	5
2. I think there are many development opportunities outside the organization.	1	2	3	4	5
3. With my current skills and conditions, it is easy to find a satisfactory job again.	1	2	3	4	5
4. Leaving the current unit, I have a lot of other jobs to choose from	1	2	3	4	5

7. Basic information

1. Gender: ①Male ②Female

2. Age: ①29 or below ②30-39years ③40-49years ④50 or above

3. Marital status: ①married ②Unmarried ③Others (e.g. divorce)

4. Education background: ① College or below ②Bachelor ③Master ④Doctor

5. Personnel type: ①Doctor ② Nurse

6. Professional title: ①Primary ②Intermediate ③Vice senior ④Senior

7. Post: ①Middle-level manager or above ②General professional technician

8. Length of service: ①5 years or below ②6-15 years③16-25 years ④26 years or above

9. Worked in this hospital: ①5 years or below ②6-15 years ③16-25 years ④26 years or above

10. Number of children: ①0 ②1 ③2 ④More than 2

11. Contract types: ①Regular ②Outsourced

12. Monthly income: ①Less than 10000 ②10001-20000 ③20001-30000 ④Above 30000

13. Please fill in your last name initial + the last four digits of your mobile phone number (such as Li Si: L6280)_____, which is only used to do two survey data matching.

Annex B: Tables

Table b.1 The reliability analysis results of each scale

Variable	Number of Items	Cronbach's Alpha
TI	4	0.881
LMX	7	0.916
Job Embeddedness	7	0.821
Job Satisfaction	6	0.899

Table b.2 Factor analysis adaptability test results

	TI	LMX	JE	JS
KMO Value	0.814	0.90	0.894	0.885
Bartlett's Test of Sphericity	<0.001	<0.001	<0.001	<0.001

Table b.3 Factor analysis of the TI scale

	Component 1
TI1	0.847
TI2	0.841
TI3	0.916
TI4	0.857
% of explained Variance	74.931%
Cronbach's Alpha coefficients	0.881

Note. n= 338. Keiser-Meyer-Olkin index = 0.814. The total variance is explained by 1 factor in 74.93%.

Table b.4 Factor analysis of the LMX scale

	Component 1
LMX1	0.759
LMX2	0.865
LMX3	0.870
LMX4	0.798
LMX5	0.755
LMX6	0.870
LMX7	0.858
% of explained Variance	68.305%
Cronbach's Alpha coefficients	0.916

Note. n= 338. Keiser-Meyer-Olkin index = 0.90. The total variance is explained by 1 factor in 68.30%.

Table b.5 Factor analysis of the JE scale

	Component 1
JE1	0.804
JE2	0.854
JE3	0.857
JE4	0.899
JE5	0.823
JE6	-0.242
JE7	0.895
% of explained Variance	63.657%

Cronbach's Alpha coefficients	0.821

Note. n= 338. Keiser-Meyer-Olkin index = 0.894. The total variance is explained by 1 factor in 63.66%.

Table b.6 Factor analysis of the JE scale

	Component 1
JE1	.807
JE2	.850
JE3	0.860
JE4	0.901
JE5	0.825
JE7	0.898
% of explained Variance	73.498%
Cronbach's Alpha coefficients	0.927

Note. n= 338. Keiser-Meyer-Olkin index = 0.896. The total variance is explained by 1 factor in 73.498%.

Table b.7 Factor analysis of the JS scale

	Component 1
JS1	0.827
JS2	0.776
JS3	0.784
JS4	0.841
JS5	0.812
JS6	0.884
% of explained Variance	67.477%
Cronbach's Alpha coefficients	0.899

Note. n= 338. Keiser-Meyer-Olkin index = 0.885. The total variance is explained by 1 factor in 67.47%.

Table b.8 Convergent validity indicators

		Model parameter estimates					Convergent validity		
Factor	Indicator	Non-standardized factor loading	S.E.	C.R.	*p*	Standardized factor loading	SMC	CR	AVE
TI	TI1	1				0.785	0.616	0.889	0.668
	TI2	0.831	0.057	14.669	***	0.749	0.561		
	TI3	0.977	0.052	18.657	***	0.929	0.862		
	TI4	0.705	0.045	15.805	***	0.796	0.633		
JS	JS1	1				0.786	0.618	0.904	0.612
	JS2	0.662	0.049	13.595	***	0.7	0.49		
	JS3	0.801	0.055	14.672	***	0.745	0.555		
	JS4	0.823	0.052	15.903	***	0.794	0.631		
	JS5	1.084	0.069	15.622	***	0.783	0.614		
	JS6	0.946	0.053	17.997	***	0.875	0.765		
JE	JE1	1				0.754	0.569	0.940	0.690
	JE2	1.159	0.076	15.192	***	0.79	0.625		
	JE3	1.299	0.079	16.505	***	0.849	0.72		
	JE4	1.184	0.068	17.466	***	0.89	0.793		
	JE5	1.03	0.069	14.942	***	0.779	0.607		
	JE7	1.184	0.068	17.438	***	0.889	0.79		
LMX	LMX1	1				0.705	0.498	0.923	0.632
	LMX2	1.304	0.09	14.48	***	0.825	0.68		
	LMX3	1.299	0.088	14.787	***	0.843	0.711		
	LMX4	1.381	0.105	13.156	***	0.748	0.559		

LMX5	1.495	0.12	12.443	***	0.706	0.499
LMX6	1.345	0.089	15.17	***	0.866	0.75
LMX7	1.338	0.089	14.972	***	0.854	0.729

Table b.9 Discriminant validity between the scales

	AVE	LMX	JE	JS	TI
LMX	0.632	0.795			
JE	0.690	0.575	0.831		
JS	0.612	0.692	0.794	0.782	
TI	0.668	-0.405	-0.617	-0.594	0.817

Table b.10 Description of sample distribution characteristics

Variable	Demographic factors	Frequency	Valid Percent
Gender	Male	94	27.8%
	Female	244	72.2%
Age	29 or below	74	21.9%
	30~39	140	41.4%
	40~49	95	28.1%
	50 or above	29	8.6%
Type of hospital	General hospital	264	78.1%
	Special hospital	74	21.9%
Marital status	married	247	73.1%
	Unmarried	85	25.1%
	Others (divorce)	6	1.8%
Education background	College or below	32	9.5%
	Bachelor	170	50.3%
	Master	103	30.5%
	Doctor	33	9.8%
Personnel type	Doctor	166	49.1%
	Nurse	172	50.9%
Professional title	Primary	111	32.8%
	Intermediate	135	39.9%
	Vice senior	70	20.7%
	Senior	23	6.5%
Post	Middle-level manager or above	29	8.6%
	General professional technician	309	91.4%
Length of service	5 years or below	74	21.9%
	6~15 years	152	45.0%
	16~25 years	73	21.6%
	26 years or above	39	11.5%
Working years in the surveyed hospital	Less than 5 years	95	28.1%
	6~15 years	144	42.6%
	16~25 years	68	20.1%
	26 years or above	31	9.2%
Number of children	0	171	50.6%
	One	105	31.1%
	Two	12	3.6%
	More than two	50	14.8%
Monthly income	Less than 10000	105	31.1%
	10001~20000	163	48.2%
	20001~30000	59	17.5%
	More than 30000	11	3.3%

Table b.11 Mean of main variables and correlation between variables

Variable	*Mean ± SD*	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Gender	1.72(0.45)	1															
2. Age	2.23(0.89)	-.127*	1														
3. Marital	1.29(0.49)	.161**	-.467**	1													
4. Education	2.41(0.79)	-.241**	.223**	-.186**	1												
5. Personnel type	1.51(0.50)	.407**	-.328**	.165**	-.694**	1											
6. Professional title	2.02(0.91)	-.253**	.726**	-.453**	.456**	-.448**	1										
7. Post	2.23(0.92)	0.093	-.252**	0.072	-.164**	0.101	-.329**	1									
8. Length of service	2.10(0.92)	0.003	.834**	-.388**	0.011	-0.053	.633**	-.246**	1								
9. Working years in the surveyed hospital	1.83(1.05)	0.005	.800**	-.376**	-0.062	-0.038	.571**	-.196**	.911**	1							
10. Number of children	1.32(0.47)	-0.072	-.251**	.224**	.131*	-.186**	-.204**	0.019	-.324**	-.307**	1						
11. Contract types	1.93(0.78)	0.082	-.580**	.406**	-.268**	.185**	-.570**	.186**	-.487**	-.494**	.168**	1					
12. Leader	1.89(0.31)	-0.022	-.276**	.143**	-0.041	-0.032	-.265**	.545**	-.269**	-.254**	0.07	.214**	1				
13. Monthly income	1.91(0.28)	-.234**	.561**	-.287**	.391**	-.377**	.667**	-.312**	.476**	.403**	-0.091	-.532**	-.228**	1			

14. TI	1.90(0.91)	-0.004	-.229**	.173**	-0.074	.109*	-.166**	0.1	-.208**	-.212**	.127*	.157**	.170**	-.136*	1	
15. LMX	3.93(0.73)	0.063	-0.063	-0.044	-.185**	.132*	-0.086	0.011	0.062	0.082	-.124*	0.081	-0.084	-.155**	-.365**	1
16. JE	3.87(0.78)	0.019	.219**	-.147**	-0.043	0.022	.134*	-.127*	.239**	.260**	-.115*	-.179**	-.235**	0.064	-.571**	.542**	1
17. JS	3.82(0.77)	.124*	0.014	-0.014	-0.095	.120*	-0.008	-0.098	0.079	0.087	-.117*	-0.016	-.189**	-0.044	-.517**	.654**	.738**

Note. *p<0.05, **p<0.01

Table b.12 The reliability analysis results of each scale

Variable	Number of Items	Cronbach's Alpha
TI	4	0.881
LMX	7	0.916
Job Embeddedness	7	0.821
Job Satisfaction	6	0.899
Career Shocks	9	0.878
Perceived Opportunities	4	0.919

Table b.13 Factor analysis adaptability test results

	TI	LMX	JE	JS	CS	PO
KMO Value	0.814	0.90	0.894	0.885	0.874	0.874
Bartlett's Test of Sphericity	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Table b.14 Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.562	50.689	50.689	4.562	50.689	50.689	3.252	36.129	36.129
2	1.807	20.075	70.764	1.807	20.075	70.764	3.117	34.635	70.764
3	0.663	7.366	78.130						
4	0.475	5.279	83.409						
5	0.395	4.384	87.793						
6	0.318	3.530	91.324						
7	0.295	3.279	94.603						
8	0.264	2.933	97.536						
9	0.222	2.464	100.000						

Note. Extraction Method: Principal Component Analysis.

Table b.15 Factor analysis of Career Shocks scale

	Component	
	NCS	PCS
CS1	0.427	0.509
CS2	0.073	0.839
CS3	0.138	0.879
CS4	0.151	0.865
CS5	0.352	0.710
CS6	0.848	0.165
CS7	0.856	0.160
CS8	0.879	0.139
CS9	0.820	0.240
% of explained Variance	50.689%	20.075%
Cronbach's Alpha coefficients	0.896	0.855

Note. n= 338. Keiser-Meyer-Olkin index = 0.874. The total variance is explained by two factors in 70.764%: NCS explains 50.69%, and PCS balances in 20.08% of the variance.

Table b.16 Factor analysis of the CS scale

	Component	
	NCS	PCS
CS2	0.077	0.831
CS3	0.152	0.888
CS4	0.166	0.875
CS5	0.363	0.713
CS6	0.849	0.157
CS7	0.862	0.159
CS8	0.882	0.132
CS9	0.826	0.239
% of explained Variance	52.336%	22.553%
Cronbach's Alpha coefficients	0.896	0.870

Note. n= 338. Keiser-Meyer-Olkin index = 0.860. The total variance is explained by two factors in 74.868%: NCS explains 52.336%, and PCS balance is 22.553% of the variance.

Table b.17 Factor analysis of the PO scale

	Component
	1
PO1	0.868
PO2	0.870
PO3	0.926
PO4	0.928
% of explained Variance	80.724%
Cronbach's Alpha coefficients	0.919

Note. n= 338. Keiser-Meyer-Olkin index = 0.834. The total variance is explained by 1 factor in 80.724%.

Table b.18 Convergent validity indicators

		Model parameter estimates					Convergent validity		
Factor	Indicator	Non-standardized factor loading	S.E.	C.R.	*p*	Standardized factor loading	SMC	CR	AVE
TI	TI1	1				0.766	0.587	0.904	0.701
	TI2	0.97	0.057	16.885	***	0.871	0.758		
	TI3	0.936	0.055	17.112	***	0.882	0.778		
	TI4	0.788	0.05	15.905	***	0.826	0.682		
PO	PO1	1				0.857	0.735	0.937	0.790
	PO2	0.925	0.051	18.238	***	0.79	0.624		
	PO3	1.049	0.041	25.501	***	0.945	0.892		
	PO4	1.072	0.041	25.914	***	0.953	0.908		
PCS	CS2	1				0.798	0.637	0.910	0.716
	CS3	1.085	0.057	19.143	***	0.909	0.826		
	CS4	1.035	0.058	17.944	***	0.861	0.741		
	CS5	1.016	0.061	16.63	***	0.813	0.661		
NCS	CS6	1				0.81	0.657		
	CS7	1.06	0.058	18.377	***	0.862	0.743		
	CS8	1.108	0.057	19.325	***	0.896	0.804		
	CS9	0.939	0.055	16.937	***	0.813	0.66		
JS	JS1	1				0.56	0.314	0.882	0.559
	JS2	0.951	0.097	9.757	***	0.701	0.491		
	JS3	1.17	0.114	10.234	***	0.758	0.575		
	JS4	1.182	0.112	10.517	***	0.796	0.633		

	JS5	1.527	0.148	10.318	***	0.769	0.592		
	JS6	1.342	0.122	10.994	***	0.865	0.749		
JE	JE1	1				0.755	0.57	0.928	0.684
	JE2	1.162	0.076	15.277	***	0.793	0.629		
	JE3	1.292	0.079	16.448	***	0.845	0.714		
	JE4	1.185	0.068	17.528	***	0.892	0.795		
	JE5	1.025	0.069	14.906	***	0.777	0.603		
	JE7	1.183	0.068	17.492	***	0.89	0.792		
	LMX1	1				0.705	0.497		
	LMX2	1.305	0.09	14.479	***	0.825	0.681		
	LMX3	1.298	0.088	14.766	***	0.842	0.709		
LMX	LMX4	1.381	0.105	13.15	***	0.747	0.559	0.923	0.632
	LMX5	1.495	0.12	12.43	***	0.706	0.498		
	LMX6	1.347	0.089	15.178	***	0.867	0.751		
	LMX7	1.339	0.089	14.973	***	0.854	0.73		

Table b.19 Discriminant validity between the scales

	AVE	LMX	JE	JS	NCS	PCS	PO	TI
LMX	0.632	0.795						
JE	0.684	0.575	0.827					
JS	0.559	0.707	0.793	0.798				
NCS	0.716	-0.206	-0.213	-0.237	0.846			
PCS	0.716	0.030	0.027	0.121	0.462	0.846		
PO	0.790	-0.156	-0.277	-0.185	0.468	0.331	0.889	
TI	0.701	-0.311	-0.494	-0.470	0.332	0.139	0.398	0.837

Table b.20 Mean of main variables and correlation between variables

Variable	*Mean ±SD*	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. Gender	1.72(0.45)	1																		
2. Age	2.23(0.89)	-.127*	1																	
3. Marital	1.29(0.49)	.161**	-.467**	1																
4. Education	2.41(0.79)	-.241**	.223**	-.186**	1															
5. Personnel type	1.51(0.50)	.407**	-.328**	.165**	-.694**	1														
6. Professional title	2.02(0.91)	-.253**	.726**	-.453**	.456**	-.448**	1													
7. Post	2.23(0.92)	0.093	-.252**	0.072	-.164**	0.101	-.329**	1												
8. Length of service	2.10(0.92)	0.003	.834**	-.388**	0.011	-0.053	.633**	-.246**	1											
9. Working years in the surveyed hospital	1.83(1.05)	0.005	.800**	-.376**	-0.062	-0.038	.571**	-.196**	.911**	1										
10. Number of children	1.32(0.47)	-0.072	-.251**	.224**	.131*	-.186**	-.204**	0.019	-.324**	-.307**	1									
11. Contract types	1.93(0.78)	0.082	-.580**	.406**	-.268**	.185**	-.570**	.186**	-.487**	-.494**	.168**	1								
12. Leader	1.89(0.31)	-0.022	-.276**	.143**	-0.041	-0.032	-.265**	.545**	-.269**	-.254**	0.07	.214**	1							
13. Monthly income	1.91(0.28)	-.234**	.561**	-.287**	.391**	-.377**	.667**	-.312**	.476**	.403**	-0.091	-.532**	-.228**	1						

14. TI	1.90(0.91)	-0.004	-.229**	.173**	-0.074	.109*	-.166**	0.1	-.208**	-.212**	.127*	.157**	.170**	-.136*	1				
15. LMX	3.93(0.73)	0.063	-0.063	-0.044	-.185**	.132*	-0.086	0.011	0.062	0.082	-.124*	0.081	-0.084	-.155**	-.365**	1			
16. JE	3.87(0.78)	0.019	.219**	-.147**	-0.043	0.022	.134*	-.127*	.239**	.260**	-.115*	-.179**	-.235**	0.064	-.571**	.542**	1		
17. JS	3.82(0.77)	.124*	0.014	-0.014	-0.095	.120*	-0.008	-0.098	0.079	0.087	-.117*	-0.016	-.189**	-0.044	-.517**	.654**	.738**	1	
18. PCS	2.92(0.97)	0.029	-.136*	0.083	-0.014	0.035	-0.064	0.015	-.152**	-.126*	0.101	0.091	-0.063	-0.098	0.085	.128*	0.104	.198**	1
19. NCS	2.94(1.03)	-0.028	-0.036	0.07	0	-0.017	-0.018	0.03	-0.074	-0.051	0.018	0.082	0.084	-0.087	.247**	-0.106	-.143**	-.165**	.408**
20. PO	3.05(0.87)	-.107*	-0.03	-0.019	.111*	-0.039	0.098	-0.099	-0.041	-0.07	0.009	0.034	0.002	.107*	.323**	-0.098	-.223**	-.118*	0.073

Note. *p<0.05, **p<0.01