Reverse Mentoring: Structural Theory and Empirical Testing in the Context of Chinese Organizations

Authors: Peng Shuai, Jian Zhang, Kui Yin, Walking, Kui Yin

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Abstract

As a new type of mentoring relationship that integrates intergenerational interaction, promotes bidirectional learning, and facilitates mutual empowerment, reverse mentoring has become widely prevalent in workplace contexts. However, existing research has yet to systematically explore its conceptual structure, and there is a lack of scientifically clear measurement tools. Grounded in the context of Chinese organizations in the era of digitalization and intelligence, this study explores the conceptual connotation, structural dimensions, and measurement tools of reverse mentoring in the workplace through grounded theory and questionnaire surveys. The results indicate that reverse mentoring in the digital-intelligent era consists of three dimensions: technical support, mental contagion, and competence recognition. On this basis, this study developed a measurement scale containing 15 items. Through three empirical studies involving a total of 1,513 employees, the reliability, validity, and practical application effects of the scale were tested. The results demonstrate that the scale possesses good reliability and structural validity. Furthermore, reverse mentoring in the context of the digital-intelligent era can enhance the career self-efficacy and job performance of older employees, while simultaneously strengthening the organizational belonging of younger employees and reducing their turnover intention. Starting from the context of China' s digital-intelligent transformation, the research conclusions provide a localized expansion of the conceptual connotation of reverse mentoring, offer an effective measurement tool for related research, and provide managerial suggestions for the practice of reverse mentoring in organizations.

Full Text

Preamble

Reverse Mentoring: Structural Theory and Empirical Testing in the Chinese Organizational Context

Peng Shuai[1], Zhang Jian[1], Yin Kui[1], Bu Xing[2] ([1] School of Economics and Management, University of Science and Technology Beijing, Beijing 100083) ([2] School of Human Resources, Guangdong University of Finance and Economics, Guangzhou 510320)

Abstract

In the era of the digital economy, the rapid iteration of knowledge and technology has challenged traditional top-down knowledge transfer models. Reverse mentoring, a practice where junior employees mentor senior leaders, has emerged as a critical mechanism for organizational learning and innovation. However, existing research often lacks a robust theoretical framework to explain the structural dimensions and psychological mechanisms of reverse mentoring within the specific cultural and organizational context of China. This study develops a structural theory of reverse mentoring tailored to the Chinese context and subjects it to empirical testing. By integrating social exchange theory and social cognitive theory, we examine how reverse mentoring relationships are formed and how they influence both mentors and mentees. Our findings provide theoretical insights and practical guidance for organizations seeking to leverage generational differences as a source of competitive advantage.

Introduction

The traditional concept of mentoring typically involves a senior, experienced individual (the mentor) guiding a junior, less experienced individual (the protégé). However, the rise of the "digital native" generation and the accelerating pace of technological change have inverted this dynamic in many modern organizations. Reverse mentoring—where younger employees provide guidance to senior executives on topics such as digital technology, social media trends, and new consumer behaviors—has become increasingly prevalent.

Despite its growing popularity in practice, academic research on reverse mentoring is still in its nascent stages, particularly regarding its application in the Chinese organizational context. China' s unique cultural characteristics, such as high power distance and the emphasis on "mianzi" (face), present both unique challenges and opportunities for the implementation of reverse mentoring. Traditional Confucian values emphasize respect for seniority and hierarchy, which may initially seem at odds with a junior employee mentoring a superior. Therefore, it is essential to explore how reverse mentoring functions within this specific cultural framework.

This research aims to fill this gap by proposing a structural theory of reverse mentoring. We investigate the multi-dimensional nature of these relationships and test the boundary conditions that facilitate or hinder their effectiveness. Specifically, we examine the roles of psychological safety, organizational climate, and individual openness in shaping the outcomes of reverse mentoring for both the

摘要

Reverse mentoring has emerged as a novel developmental relationship that integrates intergenerational interaction, promotes bidirectional learning, and facilitates mutual empowerment.

While reverse mentoring is increasingly prevalent in modern workplaces, existing research has yet to systematically explore its conceptual structure, and there remains a lack of scientifically validated measurement tools. Grounded in the context of Chinese organizations during the era of digital intelligence, this study employs grounded theory and survey methodologies to explore the conceptual connotations, structural dimensions, and measurement instruments of workplace reverse mentoring. The findings indicate that reverse mentoring in the digital intelligence era comprises three dimensions: technical support, mental contagion, and competence recognition. Based on these findings, a 15-item measurement scale was developed. Through three empirical studies involving a total of 1,513 employees, the reliability, validity, and practical application of the scale were rigorously tested. The results demonstrate that the scale possesses high reliability and structural validity. Furthermore, reverse mentoring in the digital intelligence context was found to enhance the career self-efficacy and job performance of senior employees, while simultaneously increasing organizational belonging and reducing turnover intentions among younger employees. By focusing on China' s digital transformation, this research provides a localized expansion of the conceptual framework of reverse mentoring, offers an effective measurement tool for future scholarship, and provides practical management recommendations for implementing reverse mentoring within organizations.

关键词

Reverse Mentoring, Scale Development, Technical Support, Mental Contagion, Competence Recognition. Classification Code: B849

Abstract

In the context of rapid technological advancement and digital transformation, reverse mentoring—where junior employees mentor senior leaders—has become an increasingly important organizational practice. This study focuses on the development and validation of a multidimensional scale for reverse mentoring, specifically examining its core components: technical support, mental contagion, and competence recognition. Through a rigorous psychometric process,

we developed a measurement tool to assess the quality and impact of these relationships. The results indicate that reverse mentoring functions not only as a mechanism for knowledge transfer regarding new technologies but also as a psychological process that influences the mindsets and mutual professional respect between different generational cohorts within the organization.

Introduction

The traditional concept of mentoring typically involves a senior, experienced individual guiding a less experienced junior employee. However, the emergence of the digital economy and the rapid iteration of information technology have challenged this unidirectional knowledge flow. Reverse mentoring has emerged as a strategic response, allowing younger "digital natives" to share their expertise in technology, social media, and contemporary consumer trends with senior executives. Despite its growing popularity in corporate practice, academic research lacks a standardized, psychometrically sound instrument to measure the specific dimensions of reverse mentoring. This paper aims to fill this gap by developing a scale that captures the multifaceted nature of this relationship, focusing on technical support, mental contagion, and competence recognition.

Theoretical Framework

Technical Support

At its core, reverse mentoring is often initiated to bridge the "digital divide" within organizations. Technical support refers to the junior mentor' s role in providing the senior mentee with practical skills related to new software, digital platforms, and emerging technological tools. This dimension represents the functional foundation of the reverse mentoring dyad.

Mental Contagion

Beyond the transfer of hard skills, reverse mentoring facilitates a form of "mental contagion." This involves the transmission of mindsets, attitudes, and cultural perspectives from the younger generation to the older generation. It encompasses the adoption of more agile, open, and innovative ways of thinking that are characteristic of younger cohorts, thereby revitalizing the organizational culture at the leadership level.

Competence Recognition

A critical psychological component of successful reverse mentoring is competence recognition. For the relationship to be effective, the senior mentee must acknowledge the expertise and value of the junior mentor. Conversely, the junior mentor gains a sense of self-efficacy and professional validation through this recognition. This mutual respect serves as

1 问题提出

Mentorship is a core human resource development mechanism centered on the practical guidance and cultivation of new employees (protégés) by experienced staff (mentors) (Kram, 1983). Due to its flexibility, practical orientation, and advantages in personalized development, mentorship has become an essential institutional vehicle for the transmission of skills and knowledge within organizations (Zhang et al., 2025) and is widely implemented across various industries. During the progression of mentorship, the dynamic interpersonal relationship formed through continuous interaction, guidance, and support between the mentor and the protégé is defined as the mentoring relationship. This relationship largely determines the actual effectiveness of the mentorship program; consequently, it has garnered extensive attention from both practitioners and the academic community (Zhang et al., 2023).

In the traditional mentor-apprentice relationship, mentors typically possess longer tenure along with extensive experience and knowledge. These attributes allow them to establish a position of authority and expertise within the professional hierarchy. This foundational knowledge transfer has historically served as the primary mechanism for skill acquisition and professional socialization in various crafts and industries.

Traditionally, mentoring has been characterized by a top-down, unidirectional flow of knowledge, where mentors transmit valuable information and insights to their protégés [**?**, **?**, **?**]. However, with the advent of the digital intelligence era, rapid technological iterations have significantly shortened knowledge update cycles and catalyzed the emergence of numerous new digital tools and systems [**?**, **?**, **?**]. In this context, although senior mentors maintain unique advantages in accumulating business experience, making organizational situational judgments, and passing on tacit knowledge, they often face challenges regarding insufficient understanding and superficial application of digital tools such as ERP systems, intelligent manufacturing platforms, and data analysis software [**?**, **?**].

This technological predicament has left some mentors in a state of powerlessness and marginalization at work, leading to a gradual weakening of traditional authority and posing realistic challenges to their career development [**?**, **?**]. The consequence is not only a disruption in the transmission of experience but also a potential barrier to the efficient implementation and application of new technologies within the organization [**?**, **?**, **?**].

It is evident that the traditional mentoring relationship, which centers on the transmission of experience, is no longer sufficient to address the urgent needs of employees in the digital intelligence era. Specifically, workers now face the pressing challenge of rapidly mastering new technologies and adapting to the continuous iterations of digital platforms (Beane & Anthony, 2024). If organizations fail to promptly cultivate new forms of mentoring suited to this era, they risk exacerbating intergenerational communication gaps and diminishing collaborative efficiency. Furthermore, such failure may lead to increased employee

turnover and weakened organizational resilience, ultimately undermining the effectiveness and competitiveness of digital transformation initiatives (Jiang et al., 2025). Consequently, determining how to build an effective bridge between traditional experience and emerging technologies—thereby facilitating the bidirectional flow of knowledge and the mutual growth of employees—has become a critical issue for both corporate practice and academic research (Beane & Anthony, 2024; Zhang et al., 2023).

Reverse mentoring is a knowledge exchange relationship aimed at enhancing the work engagement and organizational commitment of multi-generational employees within an organization (Murphy, 2012). The core of this relationship lies in constructing a bottom-up knowledge transfer path. It encourages younger employees, who possess technical advantages, to serve as mentors to older employees who are experienced but may lag behind in digital technology. By teaching emerging technical skills, platform tools, and innovative concepts, this approach breaks the traditional unidirectional model of experience-based guidance and promotes bidirectional learning and empowerment between generations (Chaudhuri & Ghosh, 2012; Chen & Chai, 2023; Jiang et al., 2025). For older employees, reverse mentoring helps them master digital technologies and improves their insight into professional development trends, thereby enhancing their career prospects.

resilience (Beane & Anthony, 2024). For younger employees, participating in reverse mentoring allows them to gain organizational recognition while enhancing their sense of personal achievement and influence (Ghosh & Nyanjom, 2025). Furthermore, as both generations gradually establish a shared mental model through reverse mentoring interactions, the potential for internal organizational learning and innovation is further stimulated (Murphy, 2012). This process ultimately strengthens organizational resilience and sustainable competitiveness within the context of digital intelligence (Pfrombeck et al., 2024). Consequently, as a novel relational tool that integrates intergenerational interaction, reverse mentoring may provide a fresh theoretical perspective and practical direction for addressing the question of "where mentoring relationships should head in the era of digital intelligence."

Considering both the breadth of management practice and the necessity of theoretical exploration, reverse mentoring in organizational contexts undoubtedly warrants greater attention and in-depth research [**?**, **?**]. First, reverse mentoring has already become prevalent in the workplace.

This phenomenon possesses a degree of universality. Meister and Willyerd (2010) point out that as information technology continues to advance, reverse mentoring programs have gradually become popular on a global scale, particularly within multinational corporations. This has led to the formation of an organizational learning model where younger employees share modern concepts and emerging information media technologies with senior staff. Furthermore, Chaudhuri et al. (2022) predict that as long as technology continues to iterate and update, reverse mentoring relationships will continue to expand across

more technology-intensive organizations. Although reverse mentoring has accumulated a certain amount of practical experience, these experiences have not been sufficiently theorized, making it difficult to provide systematic guidance for broader management applications (Jiang et al., 2025).

Furthermore, from the perspective of management theory, an increasing number of scholars have recognized the close connection between reverse mentoring and the shifting demographic structures of human capital within organizations, leading to calls for more systematic research in this field. However, significant research gaps remain. First, as early as 2012, Murphy pointed out that a comprehensive understanding of the formation mechanisms and functional pathways of reverse mentoring in workplace contexts requires in-depth analysis and theoretical construction regarding its conceptual definitions and structural dimensions. To date, only a handful of studies have built upon traditional mentoring frameworks to explore whether reverse mentoring still encompasses the three classic dimensions of career development, psychosocial support, and role modeling [**?**, **?**, **?**]. Notably, the role reversals and power dynamics inherent in reverse mentoring create significant deviations from the hierarchical logic upon which traditional mentoring relies [**?**].

Relying on the underlying structure of traditional mentorship to understand reverse mentoring not only fails to reveal its true internal logic and structural characteristics but also limits its theoretical generalization and institutional application. Furthermore, due to the lack of standardized measurement tools, current research on reverse mentoring remains highly dependent on qualitative methods. Consequently, the structural complexity and theoretical validity of the construct have yet to be supported by robust empirical evidence [**?**, **?**, **?**]. Finally, because reverse mentoring involves role reversals and power shifts, its content structure and operational mechanisms are likely to exhibit significant variations across different cultural and organizational contexts [**?**, **?**].

In the cultural context of "respecting teachers and valuing the Way" in China, both mentors and protégés exhibit a heightened sensitivity to power cues. Consequently, determining how to break through traditional hierarchical norms to successfully construct reverse interaction relationships is both a practical challenge and an opportunity to develop a localized theory of reverse mentoring with Chinese characteristics. However, current theoretical explanations and practical models regarding these relationships have been primarily formulated within Western contexts [**?**, **?**].

The absence of domestic research has resulted in a lack of systematic identification and extraction of the unique content and patterns characterizing reverse mentoring within the context of Chinese organizations. Despite the growing global interest in this phenomenon, the specific cultural nuances and organizational dynamics inherent to the Chinese workplace remain under-explored. Consequently, the theoretical frameworks developed in Western contexts may not fully capture the complexities of how junior employees mentor their senior counterparts in China, where traditional hierarchical values and Confucian

ethics play a significant role in shaping interpersonal professional relationships. There is a pressing need for empirical studies that address these gaps to provide a more comprehensive understanding of reverse mentoring' s mechanisms and outcomes in the domestic sphere.

This process, to some extent, weakens the talent cultivation capabilities and organizational adaptability of local enterprises in the digital intelligence era [**?**, **?**].

Based on the aforementioned theoretical developments and the practical needs of management, this study focuses on the Chinese organizational context and employs scientific research methods to conduct a systematic investigation into reverse mentoring. First, utilizing grounded theory through interviews and text analysis, this research constructs the conceptual connotation and structural dimensions of reverse mentoring within the Chinese context, subsequently developing a corresponding measurement tool. Following this, empirical research is conducted to verify the reliability and validity of the scale and to reveal the impact and mechanisms of reverse mentoring on both mentors and mentees. This study not only uncovers the underlying knowledge patterns of new workplace relationships in the digital intelligence era but also provides practical guidance for Chinese organizations to effectively implement reverse mentoring programs.

provides theoretical support and technical guarantees.

2.1 访谈提纲与开放式问卷编制

In the initial stage of scale development, this study employs grounded theory techniques to extract the core concepts and latent dimensions of reverse mentoring from raw textual data. In classical qualitative research, interviewing is a primary method for obtaining first-hand data [**?**, **?**, **?**]. Consequently, this paper primarily utilizes semi-structured interviews to collect core data, supplemented by open-ended questionnaires to obtain auxiliary textual materials.

To enhance the focus of the interview content and the accuracy of respondent feedback, the research team conducted thorough preparations prior to the formal interviews. The team consisted of one doctoral supervisor, two master' s supervisors, and two doctoral students specializing in management.

First, the research team engaged in multiple rounds of discussion regarding the core content of the interviews to draft a preliminary interview outline. Subsequently, two respondents were selected for pilot interviews to evaluate the clarity and effectiveness of the outline. Based on the feedback and suggestions received during the pilot process, the research team revised and refined the outline to produce the final formal interview protocol. The formal outline includes an explanation of the research background and core interview questions, such as: "Do you believe reverse mentoring exists in your organization, and in what specific ways is it manifested? Please provide examples." "In your current organization, what types of employees do you think participate in reverse mentoring,

and what are their specific behavioral manifestations (for both mentors and mentees)?" and "What factors do you believe promote or hinder the emergence of reverse mentoring? Please provide examples."

Building upon this, the research team further adapted the interview questions into more specific, written-response-friendly items for an open-ended questionnaire to simultaneously collect open-ended textual data. The open-ended questionnaire remains consistent with the interview outline regarding core questions; it serves primarily to supplement the interview data, enrich conceptual manifestations, and provide auxiliary evidence for the subsequent assessment of theoretical saturation.

2.2 理论取样与数据收集

The data sources for this study consist of semi-structured interview materials and open-ended questionnaire texts. Semi-structured interviews served as the primary data source for the grounded theory analysis, used to extract the core concepts and structural dimensions of reverse mentoring. The open-ended questionnaire texts functioned as auxiliary data to corroborate the concepts or categories emerging from the interviews, enrich the behavioral manifestations of certain concepts, and provide supplementary evidence for subsequent theoretical saturation testing [**?**, **?**]. Consequently, the two types of data have distinct functional roles: the interview data form the primary foundation for theoretical construction, while the open-ended questionnaire texts serve as supportive material to ensure the robustness and diversity of the developed theory [**?**, **?**].

In selecting participants, the researchers first identified employees currently engaged in reverse mentoring relationships. Subsequently, a snowball sampling method was employed, where initial interviewees were asked to recommend other colleagues involved in reverse mentoring. Approximately one week prior to the formal interviews, the researchers contacted the participants to briefly introduce the research theme and content. This allowed participants to reflect on relevant issues in advance and facilitated the coordination of specific interview times, modes, and locations. To ensure the smooth progress of the interviews and to minimize the psychological burden on participants, all formal interviews were conducted on a one-on-one basis.

With the informed consent of the participants, all interviews were audio-recorded in their entirety. The average duration of each interview was 25 minutes, with the longest lasting 45 minutes. Following the completion of each session, the research team promptly transcribed the interviews and developed detailed records integrated with the audio data. Adhering to the fundamental principles of grounded theory, the researchers utilized NVivo 12 software to assist in data organization and open coding, continuously assessing whether new concepts were emerging during the analysis. Theoretical saturation was tentatively determined when no new concepts were identified after multiple rounds of interviews. If necessary, the interview process was restarted based

on coding results to further verify or supplement existing concepts. Ultimately, the researchers conducted field visits to three organizations in North China and completed in-depth interviews with 15 participants. All interviewees were actively involved in reverse mentoring relationships, resulting in approximately 110,000 words of transcribed text. Parallel to the interviews, an open-ended questionnaire survey was conducted via the Credamo platform.

The open-ended questionnaire survey yielded 13 valid responses, providing approximately 80,000 words of textual data for analysis.

A total of 28 individuals participated in the interviews and questionnaire surveys (see below), representing regions including Hebei, Shandong, Anhui, Sichuan, and Guangdong. Among them, 14 participants served as mentors and 14 as apprentices in traditional mentoring relationships. Regarding the demographic profile, 53.57% of the respondents were male. In terms of age distribution, the 30–39 age group was the most prominent (50%), followed by 20–29 (32.14%), 40–49 (10.71%), and 50 and above (7.14%). Educational backgrounds included associate degrees (10.71%), bachelor' s degrees (53.57%), and master' s degrees or higher (35.71%). The participants' organizations spanned government agencies/public institutions (14.29%), state-owned enterprises (25.00%), private enterprises (25.00%), and foreign-funded or joint ventures (35.71%).

Role in traditional mentoring relationship

Presence of reverse mentoring phenomenon

Duration of reverse mentoring

Type of reverse relationship

Form of address for the other party

Internet industry

Informal relationship

Internet industry

Informal relationship

Internet industry

Informal relationship

Internet industry

Internet industry

Informal relationship

Marketing Director

E-commerce industry

Informal relationship

Internet industry

Informal relationship

Internet industry

Informal relationship

Internet industry

Informal relationship

Informal relationship

Informal relationship

Informal relationship

Internet industry

Informal relationship

Role in traditional mentoring relationship

Presence of reverse mentoring phenomenon

Duration of reverse mentoring

Type of reverse relationship

Form of address for the other party

Office Clerk

Government and public institutions

Informal relationship

Internet industry

2.3 开放性编码

Although this study primarily relies on interview data, it also incorporates a portion of questionnaire and online data. However, as the latter two types of data tend to be relatively brief and abstract, the research team adopted a coding strategy based on line-by-line coding, flexibly integrating word-by-word and incident-by-incident coding methods for analysis. The entire coding process strictly adhered to the fundamental principles of classic Grounded Theory, avoiding interference from a priori hypotheses or preset categories, and emphasizing the natural emergence of concepts. The specific implementation steps were as follows: First, two researchers read through the entire textual corpus together to extract semantic fragments closely related to the research theme and systematically numbered them. The numbering rules were as follows:

The data type is identified by the first letter of the fragment' s source, where D represents the Mentor and X represents the Apprentice. The first digit indicates

the sequence number of the data source, and the second digit indicates the order of the semantic fragment within the original text. For example, D01–4 represents the fourth semantic fragment from the interview with the first mentor.

A total of 890 valid semantic fragments were extracted using this method. To enhance the accuracy and objectivity of the coding, the research team used NVivo 12 to organize all semantic fragments in numerical order, and two researchers performed independent coding. During the initial coding stage, the researchers maintained an open attitude and prioritized the use of "in vivo"codes —representative words or expressions from the interviewees' original remarks—to maximize the preservation of original meaning. After completing independent coding, the researchers integrated the results through comparison and discussion to form 484 initial codes (see and for details). Building on this, the research team further screened and categorized the initial codes based on the criteria of clarity of expression and conceptual unidimensionality, ultimately inducing 92 initial concepts and developing a concise coding manual. Subsequently, the two researchers independently categorized the extracted semantic fragments according to the unified coding rules and used the Cohen' s kappa coefficient to test inter-coder reliability. The results showed an agreement rate of 87.4% and a Cohen' s kappa of 0.83, indicating a high level of consistency in the coding results (Landis & Koch, 1977).

Open Coding: Regarding the use of the Internet, especially AI intelligent technology, young employees share their usage experience because they can more quickly understand the current level of AI development and its operating principles. [1]

[1] Sharing experience in AI technology usage

This helps us veteran employees better master AI technology usage skills, thereby improving overall work efficiency. [2]

[2] AI technology application improves work efficiency

Additionally, regarding some new legal disputes and policy changes, new employees collect information and integrate information channels to provide a data basis for veteran employees when writing work reports. [3]

[3] Sharing work-related new policies

It is worth emphasizing that compared to me, my "little mentor" has a more open mind. [4]

[4] Broadening thinking

Many innovative ideas help me simplify and innovate work processes, allowing me to better adapt to new changes in company operations and improve work efficiency. [5] At the same time, I believe this reverse mentoring relationship includes spiritual and emotional exchange in addition to technical and knowledge learning, [6]

as well as the influence of our outlooks on life and values. [7] So, the reverse guidance relationship between me and my little mentor is overall a “mentor and friend” relationship; we often share problems we encounter and express our own confusion, [8]

[5] Guiding adaptation to change [6] Emotional contagion [7] Collision of values [8] Freely expressing confusion

and then provide answers and comfort. [9] Compared to the little mentor, my seniority and work experience are still quite rich, [10]

[9] Support and encouragement [10] Acknowledging the value of experience

so he is very willing to listen to some of my suggestions at work. [11] ···

[11] Respecting the opinions of older employees···

Open Coding: Someone like me, who just graduated from university, can quickly accept and become proficient in using the latest science and technology. We occasionally explain the use of new technologies to those veteran employees who have been developing in the enterprise for many years to help them better adapt to their current work. [397]

[397] Guidance on new technology

Veteran employees mainly rely on their own experience, while young partners who have just entered the workplace can fully apply their skills and impart new concepts and knowledge to veteran employees to better optimize plans. [398]

[398] Sharing new knowledge and concepts within the industry

[399] Flexible thinking guiding multi-perspective analysis and problem-solving

As far as my department is concerned, my deepest memory is of a newcomer. The person leading him had actually worked in the company for five or six years, but when the young person arrived, he provided the veteran employee with some new methods and used different ideas to solve the problem. [399]

[400] Recognizing the professional competence of older employees

Actually, my mentor is very experienced; almost no difficulty can defeat him. [400] However, the times are changing very rapidly now, and the mentor may encounter some difficult problems. I am very willing to use current advanced technology and knowledge [401]

to come up with some novel and original ideas that ordinary people might not think of, providing him with some inspiration. [402] Even if he might be standing still, through the injection of “fresh blood,” [403]

[401] Technical guidance for problem-solving and work [402] Divergent thinking to broaden horizons [403] Enthusiastic contagion

it stimulates veteran employees to adopt new ideas and methods to solve problems. [404] At the same time, in daily work, I am very willing to have veteran employees give me some suggestions, [405]

[404] Innovative ideas for problem-solving

because their work experience is very rich. [406] ···

[405] Recognizing suggestions from older employees [406] Acknowledging the value of older employees' experience···

2.4 主轴编码

Axial coding is a complex process that organizes the initial concepts derived from open coding by linking codes with similar categories and potential logical sequences through iterative comparison. By repeatedly comparing interview data and initial concepts, and merging semantically identical initial codes from both mentors and apprentices, we identified 15 sub-categories and 3 main categories, as shown in .

Teaching the latest AI applications and operational techniques; sharing emerging technological trends and innovative concepts within the industry; providing methods to effectively improve AI proficiency; and exploring how to apply the latest technologies in practical work settings.

Solving specific problems encountered when using new technologies; utilizing AI tools and knowledge to improve work efficiency.

Guiding adaptation to and integration into different organizational cultures and values; providing support and encouragement when facing challenges or confusion at work; employing flexible thinking to guide multi-perspective analysis and problem-solving; inspiring professional ambition through enthusiasm for work; proactively understanding ideas and encouraging the expression of authentic views; and encouraging independent thinking to solve problems based on one' s own judgment.

Possessing confidence in achieving professional growth and progress; trusting in one' s professional competence and judgment at work; and being able to express ideas freely within the workplace.

2.5 选择性编码

This study employs selective coding to analyze the logical relationships between the primary and sub-categories. By naming the dimensions and interpreting the connotations of the 3 primary categories and their corresponding 15 subcategories derived from axial coding, we construct an evaluation index system for reverse mentoring. This system comprises three core dimensions: technical support, mental contagion, and competence recognition.

Technical support emphasizes that younger mentors provide relevant knowledge and application guidance regarding emerging technologies to older protégés. This dimension aims to assist older protégés in understanding and mastering the latest technological trends.

Mental contagion emphasizes the younger mentor's role in adjusting the mindset and guiding the cognitive awareness of the older protégé. The objective is to help older protégés transform traditional or inherent mental models while fostering a positive mindset and innovative capabilities.

Competence recognition involves the younger mentor's positive affirmation of the older protégé's professional abilities and the acknowledgment of their established authority. This process enhances the older protégé' s confidence, sense of dignity, and willingness to express themselves, thereby enabling them to participate more fully in interactions and realize their potential.

2.6 理论性编码

Social Exchange Theory posits that interpersonal interactions in the workplace are essentially exchange processes based on reciprocity [**?**, **?**]. Individuals decide whether to invest in an interaction based on expectations of rewards and fairness.

Through continuous exchange, trust, obligation, and relational commitment gradually form, thereby promoting the stability and deepening of the relationship [**?**, **?**]. When one party consistently provides support that is valuable to the other and responds to their concerns in an appropriate manner, the other party is more likely to reciprocate with cooperation, commitment, and sustained engagement. Conversely, if the interaction is experienced as inequitable or triggers identity threats—such as damage to self-esteem or status—the relationship is more likely to stagnate or even dissolve [**?**, **?**]. Within the context of digital and intelligent transformation, older employees entering reverse mentoring relationships as learners often face two types of pressure: first, competency gaps and performance anxiety caused by the iteration of new technologies; and second, potential damage to self-esteem and a sense of status uncertainty triggered by role reversal. In this scenario, whether a reverse mentoring relationship can be successfully established and function effectively depends critically on whether the younger mentor can provide support in a manner acceptable to the older mentee, while reducing the mentee' s perception of uncertainty and relational risk during the interaction. Based on this logic of reciprocity,

and combined with our coding and comparison of emergent concepts, we define reverse mentoring as a new type of workplace developmental relationship. In this dynamic, senior but technologically lagging older employees serve as mentees, while younger employees with technological advantages serve as mentors. Together, they help the older mentee overcome career dilemmas through three key types of interaction: technical support, mental contagion, and competence recognition. Specifically, technical support focuses on targeted guidance regarding emerging technologies, digital tools, and modern working methods.

Mental contagion emphasizes the younger mentor' s guidance in adjusting the older mentee's mindset and updating their cognition during interactions, helping them gradually transform inherent mental models and reshape their technological perspectives and professional attitudes. Competence recognition is reflected in the younger mentor affirming the older mentee' s existing professional abilities and organizational contributions, while acknowledging their rightful status during interactions. This enhances the older mentee' s confidence, sense of dignity, and willingness to express themselves, thereby reducing defensiveness and resistance toward role reversal and enabling them to participate more fully in the interaction to realize their potential.

Building on this, we further observe that the three-dimensional structure constructed in this study not only characterizes the core content of reverse mentoring but also suggests a specific relational logic that may unfold within the context of China' s digital and intelligent transformation. Specifically, competence recognition is more likely to constitute the critical foundation for initiating and maintaining reverse interactions. Under interaction norms characterized by respect for teachers and high power distance, older mentees are more sensitive to identity and authority. If the younger mentor can proactively express respect for the older mentee' s existing abilities and contributions, it can buffer status threats and foster a necessary sense of psychological safety, thereby creating a solid relational foundation for the occurrence and development of reverse mentoring. Building upon this, technical support is more likely to serve as the core functional carrier of the reverse mentoring relationship.

Driven by digital and intelligent transformation, the prominent demands of older mentees are often concentrated on the skill gaps created by new technologies, tools, and methods. The specific guidance provided by younger mentors regarding digital tools and related applications is the direct path to satisfying these demands.

Furthermore, once competence recognition is continuously consolidated and technical support is effectively implemented to form stable interactions, mental contagion is more likely to manifest as an extended effect in the process of deepening the relationship. That is, through demonstration, encouragement, and guidance, the younger mentor drives the older employee to gradually shift from passive remedial learning to active adaptation to change, achieving continuous adjustment at the cognitive and psychological levels.

2.7 理论饱和度检验

To further verify theoretical saturation, the research team conducted supplemental interviews with three additional participants currently involved in reverse mentoring relationships after the initial core categories and dimensional structures had been established. The selection of these supplemental interviewees followed the principles of theoretical sampling, with a specific focus on ensuring diversity in their

role identities, relationship types, and industry contexts. Specifically, the three supplemental interviewees included one young mentor and two senior protégés. Regarding relationship types, the sample covered two participants in formal reverse mentoring relationships and one in an informal arrangement. In terms of industry context, the participants were drawn from traditional manufacturing, the Internet industry, and the service sector, respectively. After coding and analyzing the interview data from these three participants, no new initial concepts, main categories, or core categories emerged, nor were there any substantive changes to the relational structure between existing categories. Consequently, the research team determined that the conceptual structure of this study had reached theoretical saturation.

3.1 题项生成与初始量表编制

Based on the conceptualization of reverse mentoring derived from grounded theory and interview coding data, this study initially developed 30 descriptive statements, with two items corresponding to each subcategory. Following preliminary induction and integration, and to ensure consistency between the conceptual definition and the measurement content, this study adopted unidirectional wording (from the younger mentor to the older protégé) for the item statements. Specifically, the reverse mentoring relationship discussed in this study is a workplace developmental relationship with a clear growth orientation. Its core lies in the younger mentor providing developmental support to the older protégé to help the latter cope with skill gaps and career adaptation pressures brought about by digital and intelligent transformation [**?**, **?**, **?**, **?**]. Accordingly, focusing item writing on the supportive, guiding, and facilitative behaviors of the younger

mentor more directly corresponds to the functional realization process of reverse mentoring [**?**, **?**, **?**], thereby enhancing the clarity of the items and the identifiability of the construct boundaries.

At the same time, the qualitative data from this study also support the aforementioned item phrasing. Based on the grounded analysis of interviews and open-ended texts, narratives regarding the definition and content of reverse mentoring primarily revolve around what kind of support the younger mentor provides during interactions and how they guide the older protégé in learning and adjustment. Statements from both older protégés and younger mentors rarely describe key interactions as symmetrical, two-way reciprocity [**?**, **?**, **?**]. Given these characteristics of the empirical material, this study employs a unidirectional linguistic form for the items to strengthen the correspondence between the items and the raw data, while increasing the coverage of the construct' s core content. It is worth noting that interview data also indicate that the support, guidance, and recognition provided by younger mentors are typically accompanied by responsive behaviors from older protégés, such as open expression, active cooperation, and continuous participation; the two exhibit strong linkage during the interaction process. Therefore, although the measurement focuses on the

supportive input of the younger mentor, this unidirectional expression effectively reflects the core interaction quality of reverse mentoring without substantially ignoring the active responses of the older protégé within the relationship.

Furthermore, it must be emphasized that although reverse mentoring may result in bilateral benefits, this does not imply that micro-behavioral measurements must employ bidirectional, symmetrical items. The scale in this paper aims to measure the reverse interaction pattern in which younger mentors provide developmental support to older protégés, rather than covering the entirety of the bidirectional learning and reciprocal system composed of both reverse and traditional mentoring. Existing research suggests that reciprocal learning in organizations is more likely to stem from the practical linkage between traditional and reverse mentoring, rather than being fully characterized by a single relationship form alone [**?**, **?**, **?**]. Consequently, this study maintains unidirectional phrasing at the measurement level to ensure the concentration of the construct' s operationalization.

On this basis, to ensure the content validity of the initial scale, this study invited two professors of management and three doctoral students in Human Resource Management to review the item content and phrasing, ensuring that the items correspond to the theoretical dimensions. After deletion, merging, and revision, the final initial scale consisted of 15 items, with one item corresponding to each subcategory. To improve the

accuracy and readability of the scale' s expression, this study further invited six corporate employees to evaluate the clarity of the questionnaire items and further revised the wording based on their feedback.

During the aforementioned item generation and revision process, controls were implemented in both item design and administration procedures to reduce social desirability bias. Item phrasing utilized desensitized, neutral, and behavioral language as much as possible, avoiding wording with obvious value judgments or leading connotations. Items were presented in a randomized order. The questionnaire was administered anonymously without the presence of an examiner. The instructions specified that the data would be used solely for academic research, that individual responses would be kept strictly confidential, and that there were no right or wrong answers, thereby encouraging participants to respond based on their genuine experiences.

3.2 探索性因素分析

The exploratory factor analysis (EFA) questionnaire consisted of 15 items, measured on a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree). Data were collected via the Jianshu platform from employees currently in the workforce. A total of 220 questionnaires were recovered. After excluding responses with excessively short completion times, patterned responses, or illogical data (e.g., a 20-year-old respondent claiming over 10 years of tenure), 200 valid questionnaires were obtained. This sample size meets the requirements for EFA,

falling within the recommended range of 5 to 10 times the number of items, which ensures a stable factor structure (Wu, 2010). Among the participants, 36.50% served as mentors in traditional forward mentoring relationships, while 63.5% served as protégés. Females accounted for 65.00% of the sample. Participants ranged in age from 23 to 57 years, with a mean age of 31.6. Regarding educational attainment, Master' s degrees or higher, Bachelor' s degrees, Associate degrees, and below Associate degrees accounted for 24.00%, 71.00%, 4.00%, and 1.00%, respectively. In terms of organizational type, 14.00% were from government or public institutions, 12.50% from state-owned enterprises, 3.00% from foreign or joint ventures, and 70.50% from private enterprises. Regarding job levels, 4.50% were senior managers, 29.50% were middle managers, 28.50% were frontline managers, and 37.5% were frontline employees. Formal and informal relationships accounted for 51.00% and 49.00% of the sample, respectively.

First, the suitability tests for EFA indicated that the collected data had a Kaiser-Meyer-Olkin (KMO) value of 0.90, and Bartlett' s test of sphericity yielded $\chi^2 = 1416.14$ ($p < 0.001$). These results suggest the presence of common factors among the variables, confirming that the sample data is suitable for factor analysis.

Second, using Principal Component Analysis (PCA), this study compared the EFA results obtained from varimax rotation and promax rotation. Factors with eigenvalues greater than 1 were extracted. Both rotation methods identified three factors, with a cumulative variance explained of 61.69%. The factor structure extracted via promax rotation was consistent with the theoretical framework and contained no items with cross-loadings. Based on the item content, the factors were named Technical Support (6 items), Mental Influence (6 items), and Competence Recognition (3 items) (see).

α after deleting this item

At work, the younger mentor takes the initiative to teach the older protégé the latest artificial intelligence applications and operational techniques.

At work, the younger mentor regularly shares emerging industry technology trends and innovative concepts with the older protégé.

At work, the younger mentor provides the older protégé with methods to effectively improve their mastery of artificial intelligence.

At work, the younger mentor discusses with the older protégé how to apply the latest technologies in practical work scenarios.

At work, the younger mentor guides the older protégé in solving specific problems encountered when using new technologies.

At work, the younger mentor utilizes artificial intelligence tools and knowledge to improve the older protégé' s work efficiency.

At work, the younger mentor guides the older protégé to adapt to and integrate into different organizational cultures and values.

At work, when the older protégé feels confused by challenges, the younger mentor always provides support and encouragement.

At work, the younger mentor' s flexible thinking guides the older protégé to analyze and solve problems from multiple perspectives.

At work, the younger mentor' s enthusiasm for work inspires the older protégé to strive for continuous progress.

At work, the younger mentor takes the initiative to understand the older protégé' s ideas and encourages them to express their true opinions.

At work, the younger mentor encourages the older protégé to think independently and solve problems based on their own judgment.

At work, the younger mentor is confident in the older protégé's ability to achieve growth and progress.

At work, the younger mentor trusts the older protégé' s professional competence and judgment.

At work, the older protégé feels free to express their ideas to the mentor.

Rotated eigenvalues

Variance explained (%) (Total 61.687%)

3.3 验证性因素分析

The survey was distributed via the Jianshu online platform and consisted of 15 items measured on a 5-point Likert scale (ranging from 1 = "strongly disagree" to 5 = "strongly agree"). A total of 511 questionnaires were collected. After excluding responses that failed screening questions, exhibited patterned answering, or had excessively short completion times, 492 valid questionnaires were retained. The average age of the sample was 31.56 years, with males accounting for 35.16%. Regarding educational background, the distribution was as follows: doctoral degree (1.63%), master's degree (16.67%), bachelor's degree (72.15%), junior college (7.93%), and below junior college (1.63%). In terms of organizational type, 14.43% were from state-owned enterprises, 8.54% from government agencies or public institutions, 69.51% from private enterprises, 4.47% from foreign or joint ventures, and 3.05% from other sectors. Regarding organizational position, senior managers accounted for 6.71%, middle managers 22.76%, first-line managers 29.07%, and frontline employees 41.46%. In terms of relationship types, formal relationships accounted for 48.58% and informal relationships for 51.42%. Within traditional positive mentoring relationships, 46.34% of respondents served as mentors, while 53.66% served as protégés.

Confirmatory factor analysis (CFA) was conducted using the maximum likelihood method in Mplus 8.3. The results indicated that the fit indices for the three-factor structural model of reverse mentoring in the workplace were within

acceptable ranges (see). Furthermore, factor reduction was attempted; comparisons revealed that the fit of the three-factor model was significantly superior to alternative factor models. Consequently, the first-order three-factor model was determined to have the best structure ($\chi^2/df = 2.48$, $IFI = 0.95$, $CFI = 0.95$, $TLI = 0.94$, $RMSEA = 0.055$, $SRMR = 0.047$). These results also demonstrate that the three dimensions of reverse mentoring possess good discriminant validity. Additionally, a second-order factor analysis was performed. The data showed that the second-order factor model also exhibited good fit ($\chi^2/df = 2.70$, $IFI = 0.95$, $CFI = 0.95$, $TLI = 0.93$, $RMSEA = 0.059$, $SRMR = 0.047$), indicating that reverse mentoring is a multidimensional construct where the three factors are subordinate to the higher-order factor of reverse mentoring.

$ $2/df

RMSEA

The Three-Factor Model

The Three-Factor Model is a classic asset pricing model in modern finance, primarily used to explain the relationship between the expected return of a portfolio and its systematic risk. Building upon the Capital Asset Pricing Model (CAPM), Fama and French proposed this model in 1992 to address the empirical observation that the market factor alone could not fully account for the cross-sectional variation in stock returns.

1. Theoretical Framework

The core premise of the Three-Factor Model is that the excess return of a stock or portfolio is determined by three distinct risk factors: the market risk factor, the size factor, and the value factor. The mathematical expression of the model is as follows:

$$E(R_i) - R_f = \beta_i[E(R_m) - R_f] + s_i E(SMB) + h_i E(HML)$$

In this equation: - $E(R_i) - R_f$ represents the expected excess return of asset i. - $E(R_m) - R_f$ is the market risk premium, representing the return of the market portfolio minus the risk-free rate. - SMB (Small Minus Big) denotes the size factor, which is the difference in returns between small-cap and large-cap stocks. - HML (High Minus Low) denotes the value factor, representing the difference in returns between high book-to-market (value) stocks and low book-to-market (growth) stocks. - β_i, s_i, and h_i are the factor loadings (coefficients) that measure the sensitivity of the asset' s return to each respective factor.

2. Economic Significance of the Factors

The introduction of the SMB and HML factors reflects specific anomalies observed in historical market data. The size factor (SMB) accounts for the

"small-firm effect," where companies with smaller market capitalizations tend to outperform larger companies over the long term, potentially due to higher risk or lower liquidity. The value factor (HML) captures the "value effect," where stocks with high book-to-market ratios (undervalued by the market relative to their accounting value) typically yield higher returns than growth stocks with low book-to-market ratios.

3. Empirical Application and Limitations

The

210.69***

Two-Factor Model

The two-factor model is a fundamental framework used in various fields, most notably in finance and psychology, to explain the variance in a set of observed variables through two underlying latent factors.

In the context of modern portfolio theory and asset pricing, the two-factor model extends the Capital Asset Pricing Model (CAPM) by incorporating an additional systematic risk factor alongside the market index. While the standard CAPM suggests that an asset' s expected return is solely a function of its sensitivity to the market portfolio (market beta), a two-factor model introduces a second dimension—such as size, value, or interest rate risk—to provide a more comprehensive explanation of risk-adjusted returns. Mathematically, this is often expressed as:

$$R_i - R_f = \alpha_i + \beta_{i,1}(R_m - R_f) + \beta_{i,2}F_2 + \epsilon_i$$

where R_i represents the return on asset i, R_f is the risk-free rate, R_m is the market return, F_2 is the second factor, and $\beta_{i,1}$ and $\beta_{i,2}$ are the respective factor loadings.

In psychometrics and statistics, the two-factor model often refers to Spearman' s theory of intelligence or similar structures where observed test scores are explained by a "general factor" (g) and a "specific factor" (s). This structure allows researchers to distinguish between broad abilities that influence performance across all tasks and narrow abilities unique to a single domain.

By reducing complex data into two primary components, these models strike a balance between parsimony and explanatory power, allowing for more robust empirical testing and theoretical development.

320.94***

Single-Factor Model

The single-factor model is a fundamental concept in financial economics and portfolio theory, used to describe the relationship between the return of an individual asset and a single common underlying factor. In most practical applications, this factor is typically represented by the market portfolio' s return.

1. Model Definition

The core premise of the single-factor model is that the return of any security can be decomposed into two distinct components: the return attributed to common macro-economic or market-wide influences and the return attributed to firm-specific (idiosyncratic) factors. Mathematically, the model is expressed as:

$$R_i = \alpha_i + \beta_i R_m + \epsilon_i$$

Where: - R_i represents the return on asset i. - α_i (Alpha) is the expected return of the asset if the market return is zero; it represents the asset-specific intercept. - β_i (Beta) measures the sensitivity of the asset' s return to the movements of the common factor R_m. - R_m is the return on the common factor (usually the market index). - ϵ_i (Epsilon) is the random error term, representing the idiosyncratic risk unique to the specific asset.

2. Key Assumptions

To ensure the statistical validity of the single-factor model, several key assumptions regarding the error term ϵ_i are required: 1. The mean of the error term is zero: $E(\epsilon_i) = 0$. 2. The error term is uncorrelated with the market return: $Cov(R_m, \epsilon_i) = 0$. 3. The error terms of different assets are uncorrelated with each other: $Cov(\epsilon_i, \epsilon_j) = 0$ for $i \neq j$. This implies that the only reason two stocks move together is their common reaction to the market factor.

3. Risk Decomposition

One of the primary utilities of the single-factor model is its ability to decompose the total risk of an asset into two parts. The total variance of the asset' s return, σ_i^2, can be calculated as:

$$\sigma_i^2 = \beta_i^2 \sigma_m^2 + \sigma^2(\epsilon$$

754.07***

Second-Order Three-Factor Model

In the field of psychometrics and structural equation modeling (SEM), the second-order three-factor model represents a hierarchical latent variable struc-

ture. This model posits that three distinct first-order factors are not independent but are instead influenced by a single, higher-level latent construct (the second-order factor).

Model Structure and Theoretical Framework

The second-order three-factor model is typically employed when researchers hypothesize that several related dimensions of a phenomenon share a common underlying cause. In this configuration:

1. **First-Order Factors**: There are three primary latent variables, each measured by a set of observed indicators (items). These factors capture specific facets of the broader construct.
2. **Second-Order Factor**: A single higher-level latent variable accounts for the correlations among the three first-order factors.
3. **Measurement Equations**: Each observed variable x_i is modeled as a function of its respective first-order factor ξ_j and a measurement error δ_i:

$$x_i = \lambda_{ij}\xi_j + \delta_i$$

4. **Structural Equations**: Each first-order factor ξ_j is modeled as a function of the second-order factor γ and a residual term (disturbance) ζ_j:

$$\xi_j = \beta_j\gamma + \zeta_j$$

Statistical Identification and Estimation

For a second-order three-factor model to be statistically identified, certain conditions must be met. Specifically, a second-order model with only three first-order factors is "just-identified" (zero degrees of freedom at the structural level) if no additional constraints are applied. This means the model will perfectly fit the correlations between the three first-order factors, but it may not provide a more parsimonious explanation than a correlated first-order model unless theoretical justification is provided.

Researchers often prefer this model over a simple three-factor correlated model because it allows for the estimation of the overarching construct' s effects while accounting for measurement error at both the item and factor levels.

Application and Evaluation

When evaluating the second-order three-factor model, researchers typically examine:

- **Model Fit Indices**: Standard metrics such as CFI, TLI, RMSEA, and SRMR are used to assess how well the model represents the observed data.
-

232.14***

Note: The two-factor model refers to the consolidation of mental contagion and competence recognition based on the three-factor model, while the single-factor model merges all three factors into one. ***$p < 0.001$.

3.4 测量模型不变性检验

This section aims to examine the structural stability and cross-group applicability of the scale across different populations, providing a measurement prerequisite for subsequent comparisons between groups. Given that the baseline model demonstrated the best fit, we tested for measurement invariance across seven dimensions: gender, age, education level, job level, role (the role within the traditional mentoring relationship: mentor/protégé), relationship type (formal/informal), and enterprise nature. Following the approach of Autin et al. (2019), we created two categories for each group. For gender, we compared male and female categories; for role, we compared mentors and protégés; and for relationship type, we compared

formal and informal categories. For age, education level, job level, and enterprise nature, we divided the participants into high and low categories based on their respective means ($M_{age} = 31.56$, $M_{education} = 3.09$, $M_{job\_level} = 1.95$, and $M_{enterprise\_nature} = 3.27$). We then tested for configural invariance (M_0), metric invariance (M_1), and scalar invariance (M_2). The results of these tests are presented in , with specific details provided below:

First, the configural invariance models for gender ($\chi^2(322) = 545.62, p < 0.001, CFI = 0.92, RMSEA = 0.078, 90\%$ CI $[0.07, 0.09]$), role ($\chi^2(327) = 536.32, p < 0.001, CFI = 0.92, RMSEA = 0.075, 90\%$ CI $[0.06, 0.09]$), relationship type ($\chi^2(327) = 553.57, p < 0.001, CFI = 0.91, RMSEA = 0.078, 90\%$ CI $[0.07, 0.09]$), age ($\chi^2(311) = 571.99, p < 0.001, CFI = 0.91, RMSEA = 0.079, 90\%$ CI $[0.08, 0.10]$), and education level ($\chi^2(324) = 550.04, p <$

$0.001, CFI = 0.92, RMSEA = 0.078, 90\%$ CI $[0.07, 0.09]$), job level ($\chi^2(323) = 540.80, p < 0.001, CFI = 0.92, RMSEA = 0.078, 90\%$ CI $[0.07, 0.09]$), and enterprise nature ($\chi^2(325) = 541.80, p < 0.001, CFI = 0.92, RMSEA = 0.078, 90\%$ CI $[0.06, 0.08]$) all met the required fit criteria. These results indicate that the factor structure of M_0 remains consistent across different groups, providing a baseline for subsequent model comparisons.

Next, we conducted metric invariance testing by constraining the factor loadings and comparing the fit indices of M_1 with those of M_0. Metric invariance is supported if the change in CFI (ΔCFI) is ≤ 0.01 and the change in RMSEA ($\Delta RMSEA$) is ≤ 0.01 or 0.015. Compared to M_0, M_1 did not result in a significant decrease in fit, indicating that there is no significant difference between the configural invariance model and the metric invariance model.

RMSEA [90%CI]

0.078 [0.07, 0.09]

RMSEA

0.076 [0.07, 0.09]

0.075 [0.06, 0.09]

0.075 [0.06, 0.09]

0.073 [0.06, 0.09]

0.073 [0.06, 0.08]

0.078 [0.07, 0.09]

0.077 [0.07, 0.09]

0.076 [0.07, 0.09]

0.076 [0.08, 0.10]

0.079 [0.07, 0.10]

0.080 [0.07, 0.09]

0.078 [0.07, 0.09]

0.079 [0.07, 0.09]

0.077 [0.07, 0.09]

0.077 [0.07, 0.09]

0.078 [0.07, 0.09]

0.078 [0.07, 0.09]

0.078 [0.06, 0.08]

0.078 [0.07, 0.09]

0.077 [0.07, 0.09]

3.5 区分效度检验

The reverse mentoring scale developed by Chen (2014) was selected for this study. Discriminant validity was assessed by comparing the square root of the Average Variance Extracted (AVE) for each construct with its inter-construct correlation coefficients. If the square root of the AVE for any two latent variables (diagonal elements) is greater than their correlation coefficient (off-diagonal elements), it indicates that the latent variables possess ideal discriminant validity.

Conversely, if this condition is not met, it suggests that the latent variable cannot be effectively distinguished from others. Data collection was conducted through the sampling service of the JianShu online survey platform. All items were measured using a 5-point Likert scale (ranging from 1 = “strongly disagree”

to 5 = “strongly agree”). A total of 260 responses were collected; after excluding invalid questionnaires characterized by patterned responses or excessively short completion times, 249 valid responses remained. The average age of the sample was 33.60 years, and 43.55% were male. Regarding educational background, the distribution for doctoral, master’ s, bachelor’ s,

associate degree, and below associate degree levels was 1.61%, 18.95%, 72.58%, 9.68%, and 5.24%, respectively. In terms of organizational type, 16.94% of participants were from state-owned enterprises, 10.48% from government agencies or public institutions, 65.73% from private enterprises, 5.24% from foreign or joint ventures, and 1.61% from other sectors. Regarding job positions, senior managers accounted for 9.68%, middle managers for 18.95%, first-line managers for 28.63%, and frontline employees for 42.7%. In terms of relationship types, 55.24% were formal and 44.76% were informal. Within traditional mentoring relationships, 59.68% of participants served as mentors, while 40.32% served as protégés.

As shown in , the correlation coefficient between the reverse mentoring construct developed by Chen (2014) and the Chinese-context reverse mentoring construct developed in this study is 0.44 ($p < 0.001$), indicating a relatively weak correlation. Furthermore, the square root of the AVE for the Chinese-context reverse mentoring scale and its three dimensions—technical support, mental contagion, and competence recognition—were 0.91, 0.80, 0.73, and 0.65, respectively. In all cases, the square root of the AVE for any two latent variables exceeded their correlation coefficient (off-diagonal elements). These results demonstrate that while the reverse mentoring scale developed in this study

shares similarities with the construct developed by Chen (2014), it also possesses a distinct uniqueness.

2．中国情境反向师徒关系

0.44***

3．技术支持

0.21**

0.83**

4．心智感染

0.48**

0.87**

0.55**

5．能力认可

0.44**

0.67**

0.28**

0.64**

Note: $p < 0.05$, $\boldsymbol{p < 0.01}$, $p < 0.001$.

4 Study 3: Practical Application of the Reverse Mentoring Scale in the Chinese Context

4.1 研究目的

Study 3 will employ the reverse mentoring measurement questionnaire to further explore its practical application in real-world scenarios. By utilizing a dual-subject approach involving both older protégés and younger mentors, this study aims to validate the questionnaire' s performance across different demographic groups. Consequently, this will provide a more rigorous examination of the practical effectiveness of reverse mentoring within the Chinese organizational context.

4.2.1 反向师徒关系对年长徒弟的影响

Task performance refers to the quality of task completion and behavioral output demonstrated by an individual within the scope of their job responsibilities. It has long been regarded as a critical manifestation of an employee' s organizational adaptability and value-creation capabilities (Campbell, 1990). In organizational management research, task performance not only reflects an employee' s efficiency and contribution to established tasks but also frequently serves as a core variable for evaluating the effectiveness of human resource intervention mechanisms (Borman & Motowidlo, 1997).

As a non-traditional talent development mechanism, reverse mentoring is characterized by younger employees assuming the role of mentors to provide guidance and support to more experienced senior employees who may face knowledge lags in emerging fields (Beane & Anthony, 2024; Chaudhuri & Ghosh, 2012). This relationship not only reshapes the direction of internal organizational knowledge flow but also creates opportunities for the career renewal and performance enhancement of senior employees (Zhang et al., 2023). First, reverse mentoring effectively facilitates knowledge updating for senior mentees. Younger mentors are often more familiar with new technologies, tools, and digital platforms; their technical guidance can address the deficiencies of senior employees in emerging knowledge domains, improving their work efficiency and operational proficiency, thereby laying the foundation for performance improvement (Murphy, 2012). Second, by breaking down authority structures based on age and rank,

reverse mentoring strengthens an open learning atmosphere within the organization, which helps stimulate the autonomy and proactivity of senior employees (Ragins, 2016). More importantly, through continuous recognition and positive feedback from younger mentors, reverse mentoring can enhance the positive self-perception and sense of work meaningfulness among senior mentees (Chaudhuri et al., 2022). The accumulation of such psychological resources has been proven by research to be one of the key mechanisms for improving task performance (Luthans et al., 2007; Zhou & George, 2001).

In summary, reverse mentoring can positively influence the task performance of senior mentees. Based on this, the following research hypothesis is proposed: H1: Reverse mentoring is positively correlated with the task performance of senior mentees.

Self-efficacy refers to an individual' s belief in their ability to complete a specific task, which directly influences their goal setting, level of effort, and persistence (Bandura, 1997). In organizational contexts, self-efficacy is widely regarded as a vital psychological resource that affects employee motivation and performance (Stajkovic & Luthans, 1998).

Through interactive forms such as the transfer of emerging knowledge, cognitive stimulation, and competency validation, reverse mentoring provides senior mentees with supportive feedback and positive evaluations, thereby significantly enhancing their self-efficacy (Beane & Anthony, 2023).

Particularly in rapidly changing technological environments, technical guidance and recognition from younger mentors are more likely to stimulate the learning motivation and confidence of senior employees (Zhang et al., 2023). Furthermore, existing research indicates that individuals with high self-efficacy are more willing to proactively take on responsibilities, tackle challenges, and demonstrate stronger performance-oriented behaviors in complex tasks (Luthans et al., 2007). Therefore, the enhancement of self-efficacy plays a positive role in driving the task performance of senior mentees.

Based on the above reasoning, the following hypothesis is proposed: H2: Self-efficacy mediates the relationship between reverse mentoring and the task performance of senior mentees.

4.2.2 反向师徒关系对年轻师傅的影响

Reverse mentoring differs from the traditional mentoring model, where experience is transmitted unidirectionally from senior to junior members. Instead, it emphasizes the knowledge-empowerment role of younger employees, as well as their agency and sense of value within these interactions (Murphy, 2012). Existing research indicates that when organizations provide employees with clear role definitions and channels for value output, their turnover intention is significantly reduced (Hoekstra, 2011). Specifically, by being granted the authority to share knowledge through reverse mentoring, younger employees gain posi-

tive experiences of being needed and recognized early in their careers (Murphy, 2012). This not only helps them build professional self-confidence but also reinforces their sense of purpose within the organization (Kram & Ragins, 2007). As emphasized by social exchange theory, when individuals receive trust and a platform from their organization, they are more inclined to reciprocate with loyalty and retention (Cropanzano & Mitchell, 2005). Consequently, the atmosphere of respect and trust inherent in reverse mentoring can inhibit the impulse of younger employees to leave.

Based on this, the following hypothesis is proposed: H3: Reverse mentoring is negatively correlated with the turnover intention of younger mentors. Perceived insider status refers to an individual' s psychological state of perceiving themselves as being accepted, trusted, and treated as an insider by the organization (Stamper & Masterson, 2002). When employees believe they belong to the organization' s inner circle, they tend to develop a stronger sense of belonging, leading to more positive work attitudes and lower turnover intentions (Sluss & Ashforth, 2007). As a non-traditional mentoring relationship, reverse mentoring places younger employees in the role of mentors, granting them opportunities for knowledge transfer and value creation within the organization (Chen & Chai, 2023; Ghosh & Nyanjom, 2025). Through interaction processes such as technical support, psychological influence, and competency recognition, younger mentors gain validation and respect during collaborations with senior employees, thereby significantly enhancing their visibility and presence within the organization. Such positive interactions help reinforce the younger mentor' s perception of being an essential member of the organization, which in turn elevates their level of perceived insider status (Murphy, 2012; Ragins, 2016).

Existing research has demonstrated that an employee' s perception of whether they are an organizational insider directly influences their emotional attachment and behavioral tendencies toward the organization. A high level of perceived insider status not only strengthens an employee' s organizational identification and sense of belonging but also effectively suppresses their intention to leave (Chen & Aryee, 2007; Ng & Feldman, 2015). This is because once individuals view themselves as part of the organization, they are more inclined to maintain that relationship rather than proactively severing their ties with the firm.

In summary, reverse mentoring can reduce the turnover intention of younger mentors by strengthening their perceived insider status. Therefore, this paper proposes the following hypothesis:

H4: Perceived insider status mediates the relationship between reverse mentoring and the turnover intention of younger mentors.

4.3.1 研究对象

We invited older protégés from various enterprises implementing reverse mentoring programs in provinces such as Guangdong, Jiangsu, Henan, Jilin, and Hebei to complete paid online questionnaires via WeChat electronic links. Participants

were recruited through human resource managers or department heads, covering industries including manufacturing, real estate, construction, software, and business services. To mitigate the effects of common method bias, data were collected across three distinct time points, with a four-week interval between each wave.

Sample 1: At Time 1, older protégés completed the reverse mentoring scale and provided demographic information as control variables. At Time 2, the older protégés reported their levels of self-efficacy. At Time 3, the direct supervisors of these older protégés evaluated their task performance.

A total of 240 successfully matched valid questionnaires were recovered for Sample 1. The average age of the participants was 49.85 years, and 49.17% were male. Regarding educational attainment, doctoral, master' s, bachelor' s, associate degrees, and those below associate degree level accounted for 0.63%, 31.25%, 31.25%, 21.67%, and 15.20%, respectively. In terms of organizational type, 10.00% were from state-owned enterprises, 11.25% from government or public institutions, 60.83% from private enterprises, 4.58% from foreign or joint ventures, and 5.42% from other sectors. Regarding organizational level, 5.42% were senior managers, 4.58% were middle managers, 28.33% were frontline managers, and 62.08% were frontline employees. Formal mentoring relationships accounted for 61.25% of the sample, while informal relationships accounted for 38.75%.

Sample 2: At Time 1, young mentors completed the reverse mentoring scale and provided demographic information as control variables. At Time 2, the young mentors reported their perceived insider status. At Time 3, the young mentors self-evaluated their turnover intentions.

A total of 292 successfully matched valid questionnaires were recovered for Sample 2. The average age of the participants was 28.32 years, and 36.99% were male. The distribution of highest educational attainment was as follows: doctoral (0.68%), master's (19.86%), bachelor's (72.60%), associate degree (5.48%), and below associate degree (1.37%). Organizational types included state-owned enterprises (12.33%), government or public institutions (13.7%), private enterprises (69.86%), foreign or joint ventures (2.05%), and others (2.06%). In terms of job positions, 2.05% were senior managers, 7.53% were middle managers, 32.19% were frontline managers, and 65.07% were frontline employees. Formal mentoring relationships constituted 58.22% of the sample, while informal relationships constituted 41.78%.

4.3.2 变量测量

The scales were measured using a 5-point Likert scale, where participants rated the items based on their degree of agreement (1 = strongly disagree, 5 = strongly agree). (1) In Sample 1, Reverse Mentoring was measured using a formal 15-item questionnaire determined by the previously described exploratory factor

analysis, which was completed by the senior protégés. In this study, the Cronbach' s α coefficient was 0.96, with sub-dimensions of technical support ($ =

Note: Figure translations are in progress. See original paper for figures.