The influence of transactional leadership style on employees' innovation ability

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ABSTRACT

Purpose: This study delves into two mainland Chinese footwear manufacturing companies to understand the link between transactional leadership and employee creativity, focusing on the mediating role of psychological empowerment.

Design/Methodology/Approach: Employing descriptive statistical analysis, reliability analysis, confirmatory factor analysis, correlation analysis, and regression analysis, the study collected 576 valid questionnaires. Data analysis was conducted using SPSS 25 and Analysis of Moment Structures statistical software.

Findings: Results confirm that psychological empowerment positively influences employee creativity. Transactional leadership also has a significant positive impact. Notably, psychological empowerment partially mediates the relationship between transactional leadership and creativity.

Conclusions: Both transactional leadership and psychological empowerment are key factors in enhancing employee creativity, particularly in the two Chinese private footwear companies studied.

Research Limitations: The research focuses on large and medium-sized firms from two Chinese regions, excluding smaller entities. Several potential influencing factors for creativity still need to be addressed.

Practical Implications: Business leaders are advised to possess professional, solid skills, ensure fair treatment of employees, and provide appropriate rewards. Such practices can bolster team cohesion, spur innovation, and support sustainable enterprise growth.

Contribution to literature: This work underscores the influence of psychological empowerment and transactional leadership on creativity, shedding light on the former's mediating role. The findings enrich the literature and offer a foundation for future research in similar domains.

Keywords: *Creativity, Innovation effectiveness, Leader-member exchange, Leadership style, Psychological empowerment, Transactional leadership.*

1. INTRODUCTION

1.1. Introduction Background

1.1.1. Social Introduction

In today's highly competitive business environment, innovation has become a critical factor for the success of organizations. Companies must continually adapt to change in order to meet market demands, and the innovative capabilities of their employees are one of the key elements in achieving this goal. Leadership style plays a pivotal role in shaping employee behaviors and attitudes, and transactional leadership, as a widely applied management approach, has garnered significant attention for its impact on employee innovation capabilities. This study aims to delve deep into the relationship between transactional leadership style and employee innovation capabilities while also examining the moderating effect of psychological empowerment in this relationship. By researching this issue, we can gain a better understanding of how leadership style influences employee innovation performance and the role of psychological empowerment in this process. This study aims to make a valuable contribution by enabling leaders to effectively harness their own capabilities in order to inspire staff creativity, thereby bolstering their organization's competitive advantage. This study will combine theoretical frameworks, empirical research

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methods, and real-world case analyses to comprehensively explore the impact of transactional leadership style on employee innovation capabilities and how psychological empowerment plays a role in it. Through an in-depth examination of this topic, we hope to provide practical guidance and strategic recommendations for leaders on how to foster employee innovation in an ever-evolving business environment.

However, in recent years, due to the insufficient number of workers in enterprises coupled with rising labor costs, the shoe manufacturing industry has turned for the worse in an already sluggish environment. Hence, a considerable number of enterprises have headed to Southeast Asia or Africa, where the economies are rather undeveloped, to carry out production in an effort to survive as well as reduce their production costs. At the same time, by upgrading machinery and equipment, increasing R&D budgets, modifying production technology, training staff for skills, improving the production environment, strengthening management, and other methods, some domestic private enterprises strive to operate continuously and reduce the overall cost of production. Thus, in the future development of an enterprise, it must be people-oriented, strengthen its management, and keep in mind that innovation is simply the decisive factor for every company.

1.2. Background

It is well acknowledged that the success of anything is not determined by how much enthusiasm and recklessness one has for the thing but by mastering specific methods and the guidance of correct theory, as well as by continuous hard work and practices. In terms of employee effectiveness, the concept of "innovation" was first introduced by the renowned Austrian economist, Joseph Schumpeter, in his groundbreaking book "Theory of Economic Development" in 1912. Defining innovation from an economic perspective: innovation is a production function formed by the combination of production factors. Any changes in factors and combination patterns will lead to changes in the production function, hindering or promoting economic development. The connotation of innovation under this definition includes two aspects: the invention of innovation and the extension of innovation, where invention of innovation refers to the development of newly invented products, processes, mechanisms, and systems. The extension of innovation refers to the application process of innovation in an economic society.

Kanter (1988), a profound figure in the school of innovation process, believes that innovational behavior is a multi-stage process that begins with creative thinking and ends with the implementation with each stage requiring different innovation activities organized by different groups. After the "concept of innovation" has gradually been recognized in the respective fields, Marquish (1982) pointed out that innovation refers to the result of a company's new products or services or technological transformation being used as new methods. Henceforth, in order to stimulate and improve the innovation ability of employees, leaders must understand and grasp the psychological characteristics of employees from different levels, leading them to conduct training, to continue their educations, and to follow the guidance of the company. By doing so and using the incentive system, the employees can finally master their work skills, and cultivate a spirit of love and dedication to their job, grow their creativity, and inject new vitality into the overall development of the enterprise.

1.3. Research Purpose

The research objectives of this study are to investigate the impact of transactional leadership style on employees' innovation capabilities. 2 Analyze how employees' perceptions of transactional leadership styles influence their innovation performance. 3 Explore potential improvements and recommendations to enhance the positive effects of transactional leadership on employees' innovation capability.

2. LITERATURE REVIEW

2.1. Leader-Member Exchange Theory

There are traditionally two methods for leadership science research. The first is to study the personality traits of leaders and non-leaders; the second is to try to study individual performance in the team and grasp the understanding of leadership through this process. In the past, when studying the topic of leadership theory, most researchers assumed that the members of the group and the leader were similar in certain aspects of behavior, and that the leader adopted an average leadership approach to his subordinates (Schriesheim & Kerr, 1974). In fact, leaders are limited by personal and organizational resources (such as time, energy, roles, discretion, etc.) and cannot evenly allocate resources to each employee, resulting in informal groups that are centered on the leader (Dansereau, Graen, & Haga, 1975; Graen & Scandura, 1987).

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Leader-member exchange theory (LMX) is derived from vertical dyad linkage theory (VDL), but VDL theory only distinguishes between leaders and subordinates for internal and external groups, and does not consider the role-making variables placed. Scholars such as Graen and Cashman (1975) conducted in-depth research after 1975 and began to use the perspective of role-making to carry out the team formation, acquisition, and final evolution of the roles of leaders and subordinates after the formal relationship began, which gave them interactive explanations between the two parties.

In addition, social exchange theory is inserted to discuss the changes in social relations between leaders and subordinates, such as interpersonal relations and the relations through the interaction process. Leaders will classify subordinates into an external group and an internal group based on their skills, willingness to take on more working responsibilities, and trustworthiness (Liden & Graen, 1980).

A study by Graen and Cashman (1975) shows that leaders provide members of the internal group with more attention, support, information, influence, recognition, assistance, and high-quality relationships. Compared to subordinates from external groups, subordinates from internal groups are more likely to receive greater resources from their leaders. They tend to have access to more information, higher levels of trust, greater levels of attention from their leaders (Dansereau et al., 1975), empowerment (Wayne, Liden, & Sparrowe, 1994), and higher performance ratings (Gerstner & Day, 1997; Varma & Stroh, 2001). In addition, turnover rates among internal group members are relatively low, and their relationships with their leaders are generally satisfactory (Varma & Stroh, 2001).

Keller and Dansereau (1995) believe that when the quality of the exchange relationship between the leader and the subordinate is good, the leader will give subordinates more bargaining power and support the subordinate's self-worth, so that the subordinates feel that their sense of mastery has increased compared to before. What's more, in the process of empowerment, leaders should show support for subordinates rather than control roles (Wellins, Byham, & Wilson, 1991). Leaders provide more support to their team members and spend more time training them, ensuring that they have the right skills. The more coaching behaviors the leaders present, the more self-efficacy their employees will exert. Finally, according to the research on leaders and subordinate relations, team members are not only considered to have more responsibilities but are also expected to make more contributions to the organization (Liden & Graen, 1980). The so-called increase in work responsibility can be seen as an increase in self-awareness, and at the same time, providing more contributions to the work means increasing influence (Gómez & Rosen, 2001).

The establishment of an exchange relationship between leaders and members is an ongoing process that is subject to change over time. According to Bauer and Green (1996) analysis of the exchange relationship between a leader and a member, the formation and development of a "vertical duality" exchange relationship can be divided into three stages: the contact and evaluation stage, the cognition and action stage, and the affection and trust stage Figure 1.

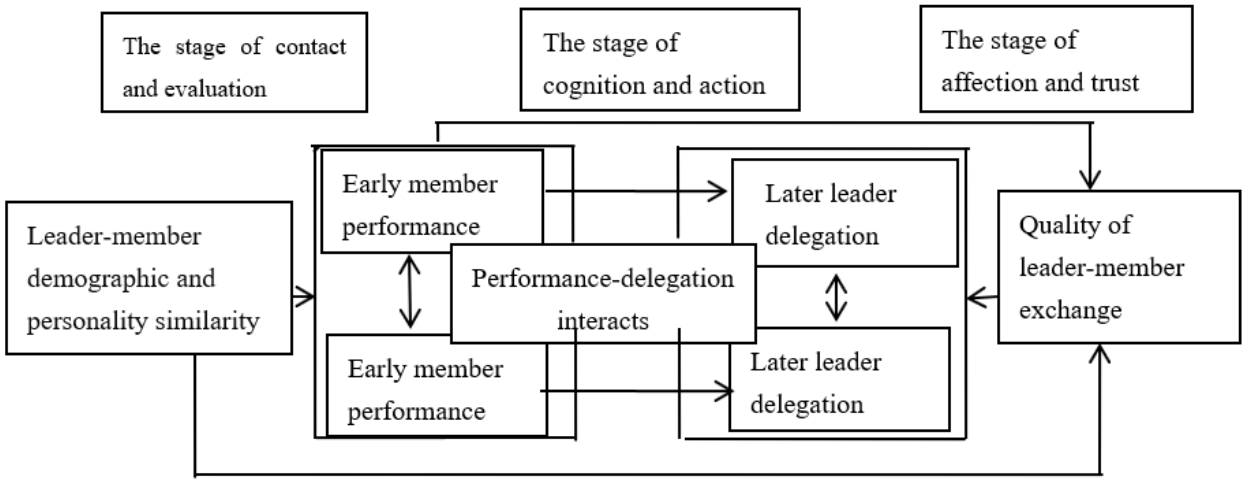

Figure 1. Model of leader-member exchange development.

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As depicted in the figure above, during the contact and evaluation stage, leaders and members have limited information about each other, which means that their initial relationship development is influenced by their personal characteristics and similarities. However, as time goes on and contact increases, previous stereotypes or biases won't have an impact on the leader's perception and assessment of their subordinates (Dienesch & Liden, 1986). Personal aptitude, perceived resources, and power which are typically the outcomes of the leader's delegation have an impact on the member's performance. However, delegation itself involves risks for the leader, so they must first establish trust in their subordinates before taking action (Lewis & Weigert, 1985). In the recognition and action stage, members who exhibit higher levels of attributes are more likely to be trusted and delegated. In the affection and trust stage, members with higher performance are more likely to gain trust and more delegation (Dienesch & Liden, 1986). Through continuous emotional accumulation, performance evaluation, and delegation, leaders and members establish high-quality communication relationships in the affection and trust stage (Bauer & Green, 1996). On the contrary, in constant communication, members without emotional support and delegation can only maintain low-quality communication with the leaders. Based on the research of Bauer and Green (1996) and Xu (2000), the LMX theory passes the following four stages as shown in Table 1.

Table 1. The development of leadership-member exchange.

Stages	Main theories	Content	Analysis
Stage one	VDL	There exists a vertical relationship between leaders and subordinates.	It introduced the internal group and external group.
Stage two	The further development of leadership-member exchange theory.	Different LMX theories have different outcomes	The roles between leader and subordinates.
Stage three	The duality exchange relationship between leaders and subordinates.	It explores a vertical duality exchange relationship between a leader and a member.	The roles between leaders and subordinates.
Stage four	Take the duality exchange relationship to the team and community level.	Further developing duality exchange relationship to the community.	Duality exchange relationship and team network.

In this study, it is suggested that the leadership-member exchange theory has evolved from the earlier vertical dyad linkage (VDL) theory. While the VDL theory focuses on the relationship and development process between the leader and specific members, the leadership-member exchange theory emphasizes the importance of understanding the individualized nature of the leader-member exchange (LMX) relationship. VDL recommends that superiors selectively establish trust relationships with specific subordinates. This trust relationship may be caused by their abilities and skills, or it may be an organizational leadership relationship that forms a network-level leadership relationship. It can be seen from the development process of the four stages that the research on the LMX relationship has been continuously developed. The level of theoretical research started at the individual level, followed by the interaction between individuals and leaders, the team level, and finally the organizational level. The assumption in this theory is that the leader has or possesses limited resources that can attract subordinates (Green, Anderson, & Shivers, 1996). In the second stage, based on the analysis of the connotation and characteristics of the concept of leader-member exchange, it focuses on the impact of leader-member exchange on employee attitudes and behavior. The reasons for the existence of the LMX relationship are analyzed, and the role of the LMX relationship is discussed. In the third stage, the leader establishes a dual relationship with multiple subordinates, which is called "leadership making". This stage is not just about the definition of the relationship between insiders and outsiders. In the fourth stage, due to the diversification and complexity of the transformation from individual to team, LMX relationship organization develops into interdependent dyadic relationships. The exchange relationship between leaders and subordinates can also exist among colleagues, team members, or even across organizations.

2.2. Transactional Leadership

2.2.1. The Concept of Transactional Leadership

There are many definitions of transactional leadership. Transactional leaders usually achieve their goals by means that include the material and psychological aspects of satisfying subordinates. Pillai, Schriesheim, and Williams

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(1999) believe that leaders should reward or remunerate those employees who have made greater successes based on their efforts in order to achieve a transactional relationship between the two parties. Yang and Yang (2016) found that transactional leadership styles are conducive to the formation of incremental innovation, and employees are more inclined to make standardized commitments and emotional commitments that are constructive to the formation of corporate innovation.

2.2.2. Measurement of Transactional Leadership

Currently, foreign researchers divide transactional leadership into two, three, and four-dimensional structures. This research refers to the measurement scale of bass. Zhang (2002) added three new dimensions: external relations and gaining support. The three dimensions of transaction leadership are summarized as follows: contingency rewards; leaders should give appropriate rewards to reward completion. Task employees, give them more opportunities to complete tasks, and provide appropriate promotion space; provide proactive exception management; give employees sufficient observation and guidance in the process of completing tasks to prevent errors; in passive exception management, leaders only intervene when employees make mistakes.

2.2.3. Related Researches on Transactional Leadership

In an organization, the leader leads the members through transactions, which are also the exchange of interests between the leader and the members. Kanungo (1982) found in the research that transactional leaders will use their power to reward employees and require them to show loyalty and associated behaviors. Transactional leaders will set up organizational goals based on the roles and job requirements of employees in a way to motivate members (Robbins & Judge, 2007). Zhu, Sosik, Riggio, and Yang (2012) used psychological empowerment as a mediating element to examine the impact of transactional leadership on followers' connections with the company. The findings suggest a link between corporate identity and transactional leadership's ability to sway followers. In his research, on transactional leadership and testing of the theoretical model of security leadership, Wang and Waldman (2014). According to the research, it has been shown that the integration of several leadership styles can effectively enhance performance outcomes. Transformational leadership can enhance employees' psychological capital, while transactional leadership can motivate employees to achieve performance goals through rewards and punishments. This has practical implications for both leaders and organizations, helping them better manage their workforce and improve performance levels.

Ding, Geng, and Shan (2021) Through the questionnaire survey of six state-owned enterprises, the synergistic moderating effect of transformational and transactional leadership styles on creativity and employee innovation is verified: a strong interaction between transformational and transactional leadership significantly positively moderates creativity and employee innovation. There is no significant moderating effect of transformational and transactional leadership on creativity or employee innovation alone. Shi, Zhao, Liang, and Wang (2021) collected data from 244 employees in China through a questionnaire survey. The study posits that transactional leadership has a positive impact on employees' innovative capabilities, which is mediated through the mechanisms of psychological safety and a positive personality. Fei (2021) Scholars have examined the variables that would impact employee creativity and invention and discovered that there are significant disparities between the effects of various leadership philosophies on employee creativity. Transactional leadership, ethical leadership, transformational leadership, service-oriented leadership, leader-member exchange, empowering leadership, inclusive leadership, and authentic leadership all significantly positively correlate with employee innovation performance, with the correlation growing over time. Lin, Luan, and Zhao (2022): Using meta-analysis as the research method, based on 129 pieces of literatures, the following conclusions are drawn: (1) Transactional leadership is significantly related to task performance (ρ=0.28), organizational citizenship behavior (ρ=0.34), and innovation performance (ρ=0.27). Positive correlation; (2) After controlling for transformational leadership, transactional leadership explained a significant increase in variance for task performance but not for organizational citizenship behavior or innovation performance; (3) The performance evaluation method significantly moderated the variance of transactional leadership relationship with task performance and innovation performance. Zhang, Li, and Lei (2022) conducted surveys among employees from diverse industries and backgrounds, analyzing the relationship between leaders and employees' social exchange relationships and work engagement. The research findings reveal that transactional leadership has a significantly positive influence on employees' work engagement, and this influence is achieved through the social exchange mechanisms between leaders and employees. Brownell

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(1983) believes that transactional leaders in organizations will focus on task orientation and decentralize innovation tasks. Although employees do not innovate voluntarily, they will actively contribute innovative behaviors and achieve the purpose of innovation when they are required to do so. Based on that, this study proposes.

H_1: Transactional leadership style has a positive impact on the innovation effectiveness of employees.

2.3. Psychological Empowerment

2.3.1. The Concept of Psychological Empowerment

Empowerment has received more and more attention in academic and practical environments (Donovan, Rossiter, Marcoolyn, & Nesdale, 1994), and it is believed that empowering employees will benefit employees and managers, thereby affecting both management and organizational effectiveness (Koberg, Boss, Senjem, & Goodman, 1999). The earliest concept of psychological empowerment originated from the social movement of self-help views in the 1970s. Blauner (1964) mentioned the workers' autonomous behaviors of automated work in different working conditions. It wasn't until Conger and Kanungo (1988) and Thomas and Velthouse (1990) integrated psychological empowerment into the fields of psychology and management that scholars began to pay attention to the psychological cognitive level of psychological empowerment in work tasks. Binyamin and Carmeli (2020) define psychological empowerment as the extent to which employees perceive themselves as capable, autonomous, and influential in their work, thereby fostering employees' job performance and organizational change. Zhang, Zheng, and Cai (2021) pertain to the extent to which employees perceive themselves as capable, autonomous, and influential in their work, leading to increased job satisfaction and reduced job burnout.

2.3.2. Measurement of Psychological Empowerment

Thomas and Velthouse (1990) proposed a psychological empowerment model, describing in detail the cognitive variables that resulted in this motivation. They believe that psychological empowerment is intrinsic motivation and the motivational effects produced by the individual's internal assessment of the task. By measuring the cognitive variables, which determine the psychological empowerment of the employees, their subjective assessment of their work would be reflected. Meanwhile, Spreitzer (1995) takes the model designed by Thomas and Velthouse (1990), proposes meaning, self-efficacy, self-determination, and impact as four levels of psychological empowerment, and develops a method for evaluating them. Therefore, this article adopts the psychological empowerment model proposed by Spreitzer (1995).

2.3.3. Related Researches on Psychological Empowerment

When employees experience changes in their psychological empowerment within the organization, it will directly affect their performance and behavior. In order to further understand the relationship between psychological empowerment and other variables, scholars at home and abroad have conducted various researches on this variable. Zheng (2011) finds out that when employees realize the meaning, ability, and self-determination of their psychological empowerment, they will not only reduce behaviors that hurt others but also curtail harmful behaviors within the organization. Ren, Cui, and Liu (2020) The higher the organizational engagement atmosphere, the higher the employee's individual work engagement level; psychological empowerment, as an overall construct, can mediate the positive impact of organizational engagement atmosphere on employees' individual work engagement across layers; psychological empowerment is in the cross-layer mediation process. The dimensions of autonomy, efficacy, and meaning of work played a significant mediating role, while the dimension of influence did not play a mediating role. Sun (2022) considers that psychological intervention for adolescents through psychological empowerment can help adolescents improve their mental health quality and has positive significance in promoting the healthy growth of adolescents. Su and Yu (2022) proposed that managers should pay attention to the structural empowerment effect and guide team innovation by paying attention to the psychological state of employees and creating an atmosphere of knowledge sharing.

According to Bowen and Lawler (1992), rewards and incentives will also have an impact on how psychologically empowered employees are, and a reward and incentive structure that is tied to individual performance is advantageous for raising psychological empowerment among employees. It is suggested that, in light of the technique's literature review:

H_2: Transactional leadership style has a positive impact on psychological empowerment.

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H_3: Psychological empowerment has a positive impact on employees' innovation ability.

2.4. Innovation Effectiveness

2.4.1. The Concept of Innovation Effectiveness

The innovation effectiveness of employees, or employee creativity, is currently the core competitive advantage for the survival and development of Chinese private enterprises. Employee creativity, according to Zhou and George (2001), is defined as the capacity of an organization's members to provide creative, appropriate, practical, and accurate solutions through the thinking process. Chen, Ding, Lin, and Huang (2003) intend to start from the perspective of the corporate world and believe that creativity refers to the ability of organizational members to generate innovative opinions and ideas in the field of work. Gumusluoglu and Ilsev (2009) hold the notion that the process by which members of an organization produce new results in a working environment is employee innovation. Özsomer, Altaras, and Cooil (2020) introduced a framework for innovation capability, which encompasses factors such as an organization's resources and capabilities, strategic direction, organizational culture, and leadership. Liu, Chen, and Chen (2021) define innovation capability as the potential and capacity of both the organization and its employees in the context of innovation.

2.4.2. Measurement of Innovation Effectiveness

The research scope of innovation effectiveness is mainly based on the creativity 4-PS theory mentioned by Rhodes in the mid-1960s, covering person, process, place and product. In addition, Chen et al. (2003), on the grounds of 4-PS theory, further divide creativity into two parts: creativity demand and creativity supply. The former uses an organizational or work standpoint to examine the degree of creativity that organization members should possess, and the latter refers to the performance of creativity, which refers to the methods used by the organization's members to produce fruitful new ideas and their capacity for innovation.

2.4.3. Related Research on Innovation Effectiveness

Regarding leadership styles, scholars hold different views on the role of transactional leadership contingency rewards in influencing employee innovation behavior:

Ricketts and Nelson (1987) believe that transactional leaders in organizations will focus on task orientation and separate innovation tasks. Although they are hesitant to take the initiative to innovate, employees must actively engage in innovative behaviors and accomplish the goal of innovation when their leaders demand it.

Mei (2011) uses both qualitative and quantitative research based on made-up deductive reasoning to look at how shared transactional leaders' psychological empowerment affects employees' willingness to be creative.

Zhang et al. (2022) Government R&D support has an incentive effect on the innovation ability of enterprises, and this effect is more prominent in enterprises with severe financing constraints.

Li and Gao (2022) The average age of the executive team is negatively correlated with the innovation capability of the enterprise, and the product market competition cannot adjust the correlation; the average education background of the executive team is positively correlated with the innovation ability of the enterprise.

To sum up, this research believes that transactional leadership can greatly enhance the innovation effectiveness of employees through the external motivation and needs of employees, thereby promoting the innovative behavior of employees. Accordingly, the following hypothesis is put forward:

H_4: Psychological empowerment has a mediating effect between transactional leadership style and employee innovation effectiveness.

3. RESEARCH METHODS

The purpose of this study is to investigate the relationship between effective employee creativity and transactional leadership, as well as the mediating effect that psychological empowerment has on the first two variables. This chapter includes five parts: the first part draws a research framework based on the literature analysis; the second part comprehensively puts forward research hypotheses; the third part further explains the definitions of the proposed variables and their measurements; the fourth part includes research objects and sampling methods; the fifth part touches upon the introduction of analysis tools and the analysis of data through different research methods.

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3.1. Research Framework

The research's rationale and purpose, as well as the findings of the literature review, indicate that transactional leadership style has an impact on how effectively employees innovate. In addition, this research uses the literature review of Chapter 2 as the theoretical basis to further propose the research framework as shown in Figure 2.

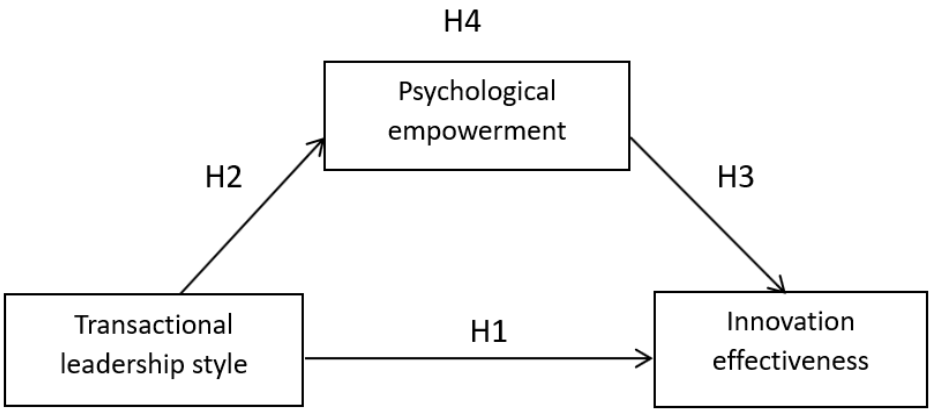

Figure 2. Research framework.

3.2. Research Hypothesis

This study primarily examines the relationship between transactional leadership style and employee innovation effectiveness as well as the mediating role of psychological empowerment in this relationship. Hence, the following theories are put forth:

H_1: Transactional leadership style has a positive impact on employees' innovation effectiveness.

H_2: Transactional leadership style has a positive impact on psychological empowerment.

H_3: Psychological empowerment has a positive impact on employees' innovation effectiveness.

H_4: Psychological empowerment has a mediating effect between the transactional leadership style and the innovation effectiveness of employees.

3.3. Variable Definition and Measurement

3.3.1. Transactional Leadership

3.3.1.1. The Dimensions and Operational Definitions of Transactional Leadership

Transactional leadership is the exchange of benefits between leaders and employees to establish reciprocal relationships so that employees can successfully complete the tasks assigned by the leader. The three benchmarks from Bass and Avolio (1989)—contingency reward, passive management by exception, and active management by exception—are mostly used in this work.

3.3.1.2. The Source of the Scale of Transactional Leadership

The Transactional Leadership Scale of this research comes from Bass and Avolio (1993), which divides transactional leadership into three dimensions and twelve items, including contingency compensation, passive management by exception, and active management by exception, to name a few examples. The remaining questions are all forward-looking questions, except for questions 7 through 9.

3.3.2. Psychological Endowment

3.3.2.1. The Dimensions and Operational Definitions of Psychological Empowerment

The operational definition of psychological empowerment in this research adopts the cognitive model of psychological empowerment proposed by Thomas and Velthouse (1990). It believes that psychological empowerment is the intrinsic motivation and motivational effects produced by the individual's evaluation of tasks and cognition, which focuses on the process that the individual senses from the empowerment. As for the measurements, the four dimensions of meaningfulness, competence, choice, and impact of intrinsic drive and impact from Thomas and Velthouse (1990) are applied to understand the cognition of an individual on psychological empowerment.

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3.3.2.2. The Source of the Scale of Psychological Empowerment

In the measurement of psychological empowerment, the psychological empowerment scale from the studies of Spreitzer (1995) and Thomas and Velthouse (1990) is introduced for this paper.

3.3.3. Innovation Effectiveness

3.3.3.1. The Dimensions and Operational Definitions of Innovation Effectiveness

Taking the reference from Chen et al. (2003) and drawing the lesson from Zhou and George (2001) point of view, this paper argues that employee creativity means that leaders believe that subordinates have the ability to generate innovative ideas and thoughts in practical work.

3.3.3.2. The Source of the Scale of Innovation Effectiveness

The scale of this research is taken from the creativity table designed by Zhou and George (2001), and there are a total of thirteen research questions after revising the vocabulary or sentences to meet the needs of this research.

3.4. Sampling Object

The objects of this research are in Quanzhou City, Fujian Province, and Taizhou City, Zhejiang Province, where there are many Chinese footwear private enterprises. These two regions are important production bases for my country's private footwear industry and are known as the "Chinese shoe capital". Questionnaires were handed out to the employees, below the level of manager, of the shoe factories A and B. This survey research adopts non-random convenience sampling, so the questionnaire is distributed according to the scholar Thompson (2000) suggestion: in the factor analysis, the ratio of each item to the sample number is about 1:10 to 1:15. There are 43 questions for this research, and the number of samples needed is between 430 and 645. Therefore, 700 is a more appropriate number of questionnaires to be distributed.

3.5. Data Analysis Methods

After the formal questionnaires are collected, the invalid questionnaires are eliminated one by one, and the valid questionnaires will be sorted and compiled and then input into the computer file. Statistical Package for the Social Sciences25 and AMOS will be applied to carry out statistical tests for regression intermediary analysis, confirmatory factor analysis, reliability analysis, correlation analysis, and descriptive statistical analysis.

4. STATISTICAL ANALYSIS

Based on sample statistics and by using SPSS 25 and AMOS, the outcomes of reliability analysis, confirmatory factor analysis, correlation analysis, and regression analysis, as well as descriptive statistical analysis on the 570 valid questionnaires, are illustrated in this chapter to check the practicality of this research.

4.1. Descriptive Statistical Analysis

This article collected a total of 570 valid samples and conducted a descriptive analysis of the basic situation of the surveyed subjects in terms of gender, education level, birth place, monthly income, seniority, job title, etc. The analysis from the SPSS 25 software shows that: 1. The number of men working in the manufacturing industry is much higher than that of women, indicating that women are less likely to work in this industry, and it also reflects that shoe manufacturing is a labor-intensive industry. 2. People engaged in the footwear manufacturing industry are generally less educated. Compared with other industries, the education requirements of the footwear manufacturing industry are not the most important. 3. Urban residents are even less willing to engage in this kind of work. 4. The wages for manufacturing shoes are not very high. 5. Compared with other manufacturing industries in China, the turnover rate of workers engaged in shoe industry is higher. This also explains why so many shoe factories have turned to other, less developed, developing economies.

4.2. Reliability Analysis

In the reliability analysis, Cronbach's Alpha reliability coefficient is mainly used to check the consistency of the survey questionnaire research variables in each measurement item. Nunnally (1978) believes that the variables will be reliable if the reliability of each aspect of the study is estimated to exceed 0.7. Refer to Table 2, reliability

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analysis of items related to each dimension of transactional leadership, psychological empowerment, and employees' innovation capability.

Contingency reward, passive management by exception, active management by exception, meaningfulness, competence, choice, impact, and employee creativity are the three variables and a total of eight dimensions in this study. The results of each variable's reliability test are displayed in Table 3. For each variable dimension, the Cronbach's Alpha coefficients are as follows: contingency reward: 0.804; passive management by exception: 0.876; active management by exception: 0.870; meaningfulness: 0.841; competence: 0.837; choice: 0.836; impact: 0.814; and employee creativity: 0.933. It is clear from the aforementioned reliability coefficients that they are all greater than the benchmark of 0.7, demonstrating the good internal consistency and reliability of the variable dimensions. Each measurement item satisfies the criteria for the research when the correlation coefficient of the Cognitive Interviewing and Testing Consultant is greater than the threshold of 0.5. The analysis of "Cronbach's Alpha value after removing items indicates that the elimination of any individual item does not yield an increase in Cronbach's Alpha, hence providing evidence for the reliability of the variables.

4.3. Confirmatory Factor Analysis

This study uses SPSS 25 and AMOS statistical software to analyze the dimensions of each variable. Each measurement index has a standardized factor load larger than 0.6. The CR value represents the dependability of the measurement variables' composition. The internal consistency of these indicators increases with reliability. The appropriate cutoff is 0.7 (Hair Jr, Anderson, Tatham, & Black, 1997).

4.3.1. Transactional Leadership

Transactional leadership has 3 dimensions: contingency reward, passive management by exception, and active management by exception. Contingency reward, passive management by exception, and active management by exception are the three dimensions of transactional leadership. There are a total of 12 measuring questions. The following Figure 3: Transactional Leadership Confirmatory Factor Analysis and Table 3 are the results of confirmatory factor analysis; Table 4 is also the same.

Table 2. The analysis regarding transactional leadership, psychological empowerment, and innovation capability is as follows.

Factor	Item	Corrected item-total correlation	Cronbach's alpha if item deleted	Cronbach's alpha
Contingent reward	x11	0.614	0.756	0.804
	x12	0.594	0.767	
	x13	0.590	0.770	
	x14	0.682	0.723	
Passive management by exception	x21	0.811	0.810	0.876
	x22	0.769	0.828	
	x23	0.704	0.858	
	x24	0.670	0.867	
Active management by exception	x31	0.786	0.809	0.87
	x32	0.703	0.842	
	x33	0.699	0.844	
	x34	0.706	0.841	
Meaningfulness	m11	0.656	0.807	0.841
	m12	0.657	0.806	
	m13	0.708	0.784	
	m14	0.677	0.798	
Competence	m21	0.731	0.745	0.837
	m22	0.702	0.776	
	m23	0.672	0.800	
Choice	m31	0.711	0.758	0.836
	m32	0.698	0.772	
	m33	0.682	0.787	
Impact	m41	0.687	0.828	0.814

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Factor	Item	Corrected item-total correlation	Cronbach's alpha if item deleted	Cronbach's alpha
	m42	0.687	0.829	
Employee creativity	y1	0.676	0.928	0.933
	y2	0.673	0.929	
	y3	0.617	0.931	
	y4	0.659	0.929	
	y5	0.708	0.927	
	y6	0.739	0.926	
	y7	0.663	0.929	
	y8	0.710	0.927	
	y9	0.711	0.927	
	y10	0.716	0.927	
	y11	0.762	0.925	
	y12	0.692	0.928	
	y13	0.694	0.928	

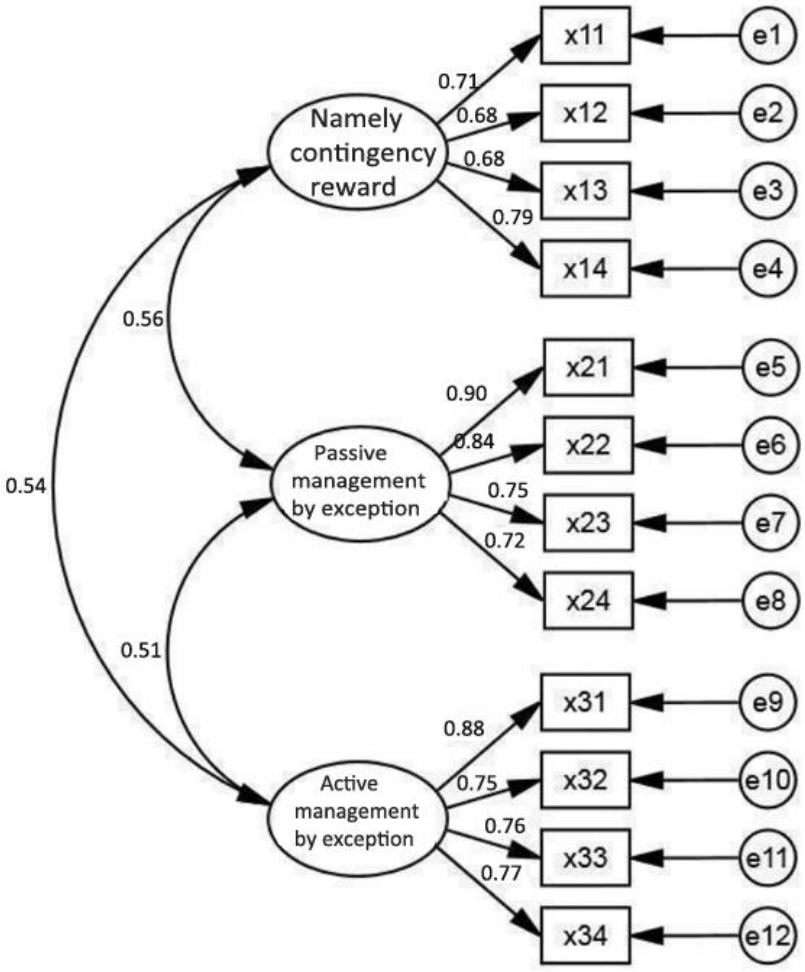

Figure 3. Transactional leadership CFA.

From the above Figure 3 transactional leadership CFA, transactional leadership has three dimensions. The factor loadings of questions x11-x12 under the contingency reward are: 0.71, 0.68, 0.681, and 0.79. The second

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dimension, passive management by exception, has the questions x21-x24f with factor loadings of 0.90, 0.84, 0.75 and 0.72. With active management by exception, the four questions of x31-x34 have factor loadings of 0.88, 0.75, 0.76 and 0.77. Since the factor loadings of the above questions are all greater than 0.5 and above 0.7, it means that the three dimensions have good convergence validity.

As shown in Table 3, Chi Square Divided by Degrees of Freedom has statistical value of 2.28, which is less than the desired value of 3. Furthermore, AGFI, GFI, NFI, TLI, IFI, and CFI, all reach the standard of 0.9 or more, while root mean square residual is 0.047, which is less than 0.08, and the root mean square error of approximation is 0.047, which is less than 0.08. Each fit index meets the general research standards. Therefore, it can be judged that this model is well-fitted.

Table 3. The fits indices of confirmatory factor analysis.

Fit indices	Ideal value	Result	Fit goodness
CMIN	——	116.287	——
DF	——	51	——
CMIN/DF	<3	2.280	Good
RMR	<0.08	0.047	Good
GFI	>0.8	0.968	Good
AGFI	>0.8	0.951	Good
NFI	>0.9	0.967	Good
IFI	>0.9	0.981	Good
TLI	>0.9	0.976	Good
CFI	>0.9	0.981	Good
RMSEA	<0.08	0.047	Good

Table 4. Results of the confirmatory factor analysis of the aspects of transactional leadership are shown.

Variables	Constructs	Factor loadings	T - value	CR	AVE
Contingency reward	x11	0.707		0.807	0.513
	x12	0.680	14.186		
	x13	0.681	14.202		
	x14	0.790	15.874		
Passive management by exception	x21	0.900		0.881	0.650
	x22	0.843	25.810		
	x23	0.748	21.438		
	x24	0.721	20.302		
Active management by exception	x31	0.879		0.872	0.631
	x32	0.754	20.662		
	x33	0.763	21.006		
	x34	0.773	21.410		

Table 4 shows that each index of contingent reward, passive management by exception, and active management by exception has a standardized factor loading greater than 0.6. The composition reliability (CR) value, also known as the internal consistency of construct indicators, is the dependability of the measurement variable as a whole. The internal consistency of these indicators increases with reliability. The acceptable threshold is generally thought to be 0.7 (Hair Jr et al., 1997), while the table gives 0.807, 0.881, and 0.872 respectively. The variation explanatory power of the latent variable for each measurement item is determined using the average variance extracted (AVE). The latent variable has the best reliability and convergence validity if the AVE value is higher. According to Fornell and Larcker (1981), the standard value must be greater than 0.5 (i.e., the dimension's explainable variation must be greater than the measurement error). The AVE values of the aforementioned dimensions are, accordingly, greater than 0.5 and are 0.513, 0.65, and 0.631, respectively, indicating that each variable has good convergence validity.

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4.3.2. Psychological Empowerment

The four components of psychological empowerment are impact, competence, choice, and meaningfulness. There are a total of 12 measuring questions. Confirmatory factor analysis was used to produce the following Figures 4, Tables 5, and Tables 6.

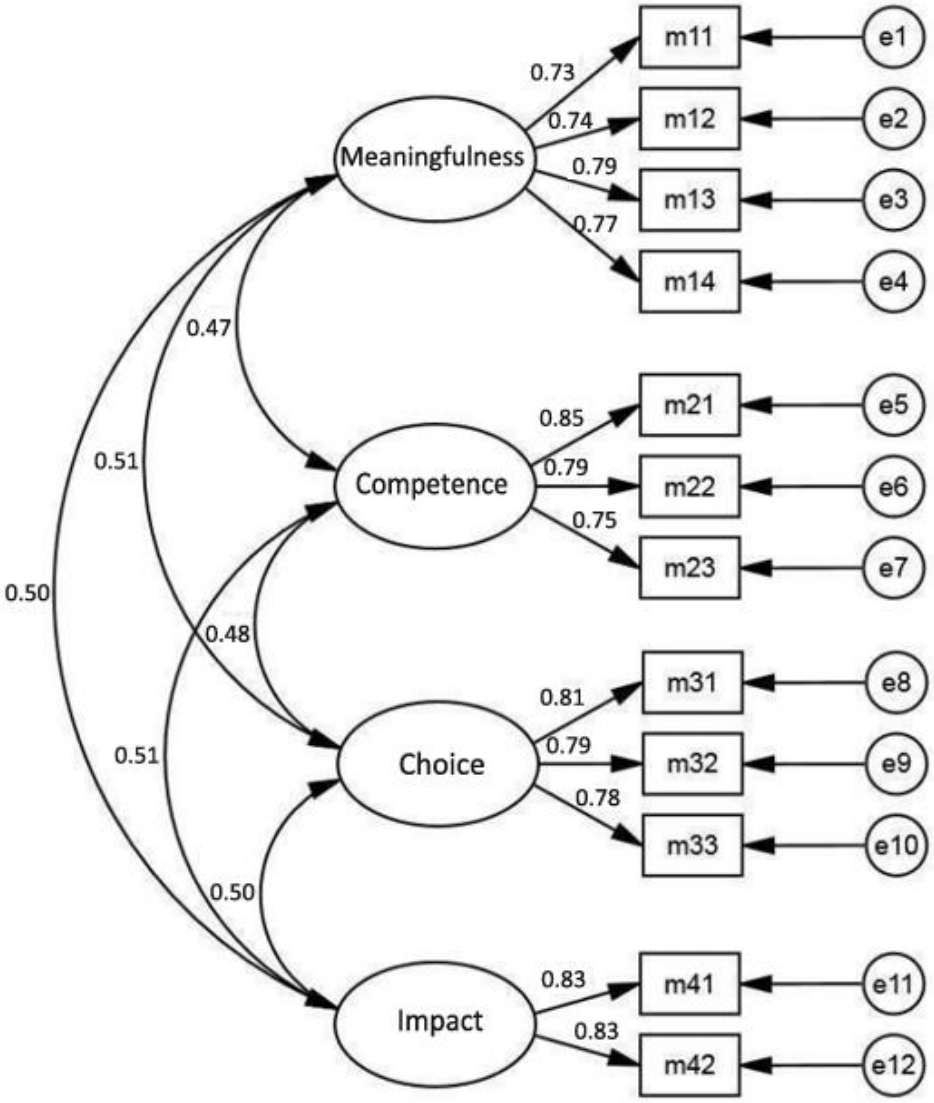

Figure 4. Psychological empowerment CFA.

From the above Figure 4, it can be illustrated that psychological empowerment is divided into four dimensions, of which dimension 1 has four questions m11-m14, and the factor loading of each item is: 0.73, 0.74, 0.79, 0.77; dimension 2, competence has three questions m21-m23, and the factor loading coefficient of each item is: 0.85, 00.79, 0.75; dimension 3, choice includes three questions 31 -m33, and their factor loadings are: 0.81, 0.79, 0.78; dimension 4, impact has two questions m41-m42, both with the factor loadings of 0.83. The factor loadings of the above questions are all greater than 0.5 and above 0.7, indicating good convergence validity.

From Table 5, we can see that the statistical value of CMIN/DF is 2.041, which is less than 3 of the ideal value. Adjusted Goodness-of-Fit Index、Goodness-of-Fit Index、Normed Fit Index、Tucker-Lewis Index、Incremental Fit Index、 Comparative Fit Index all reach the standard of above 0.9, while RMR is 0.038 which is less than 0.08 and RMSEA is 0.043 which is less than 0.08. Each index meets the general research standards, so it can be considered that this model is well-fitted.

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Table 5. The fits indices of confirmatory factor analysis.

Fit indices	Ideal value	Result	Fit goodness
CMIN	——	97.953	——
DF	——	48	——
CMIN/DF	<3	2.041	Good
RMR	<0.08	0.038	Good
GFI	>0.8	0.972	Good
AGFI	>0.8	0.955	Good
NFI	>0.9	0.969	Good
IFI	>0.9	0.984	Good
TLI	>0.9	0.978	Good
CFI	>0.9	0.984	Good
RMSEA	<0.08	0.043	Good

Table 6. Analysis results of confirmatory factors of psychological empowerment.

Variables	Constructs	Factor loadings	T - value	CR	AVE
Meaningfulness	m11	0.730		0.842	0.571
	m12	0.736	16.148		
	m13	0.786	17.100		
	m14	0.769	16.792		
Competence	m21	0.851		0.839	0.636
	m22	0.789	19.305		
	m23	0.749	18.414		
Choice	m31	0.809		0.836	0.629
	m32	0.794	18.630		
	m33	0.777	18.317		
Impact	m41	0.828		0.814	0.686
	m42	0.829	14.868		

Table 6 shows that each dimension's factor loadings—meaningfulness, competence, choice, and impact—are all greater than 0.6. The composition reliability (CR) value, also known as the internal consistency of construct indicators, is the dependability of the measurement variable as a whole. According to Hair Jr et al. (1997), the acceptable threshold is commonly regarded as being 0.7; however, the values in Table 6 are 0.807, 0.881, and 0.872, all of which are higher than 0.7. The table displays the average variance extracted (AVE), which is larger than 0.5 and indicates that each variable has good convergence validity. It has values of 0.571, 0.636, 0.629, and 0.551, respectively.

4.3.3. Employee Creativity

13 measuring questions are included in one dimension of employee creativity. The following Figure 5 CFA of employee creativity and Tables 7 and 8 represent the results of confirmatory factor analysis.

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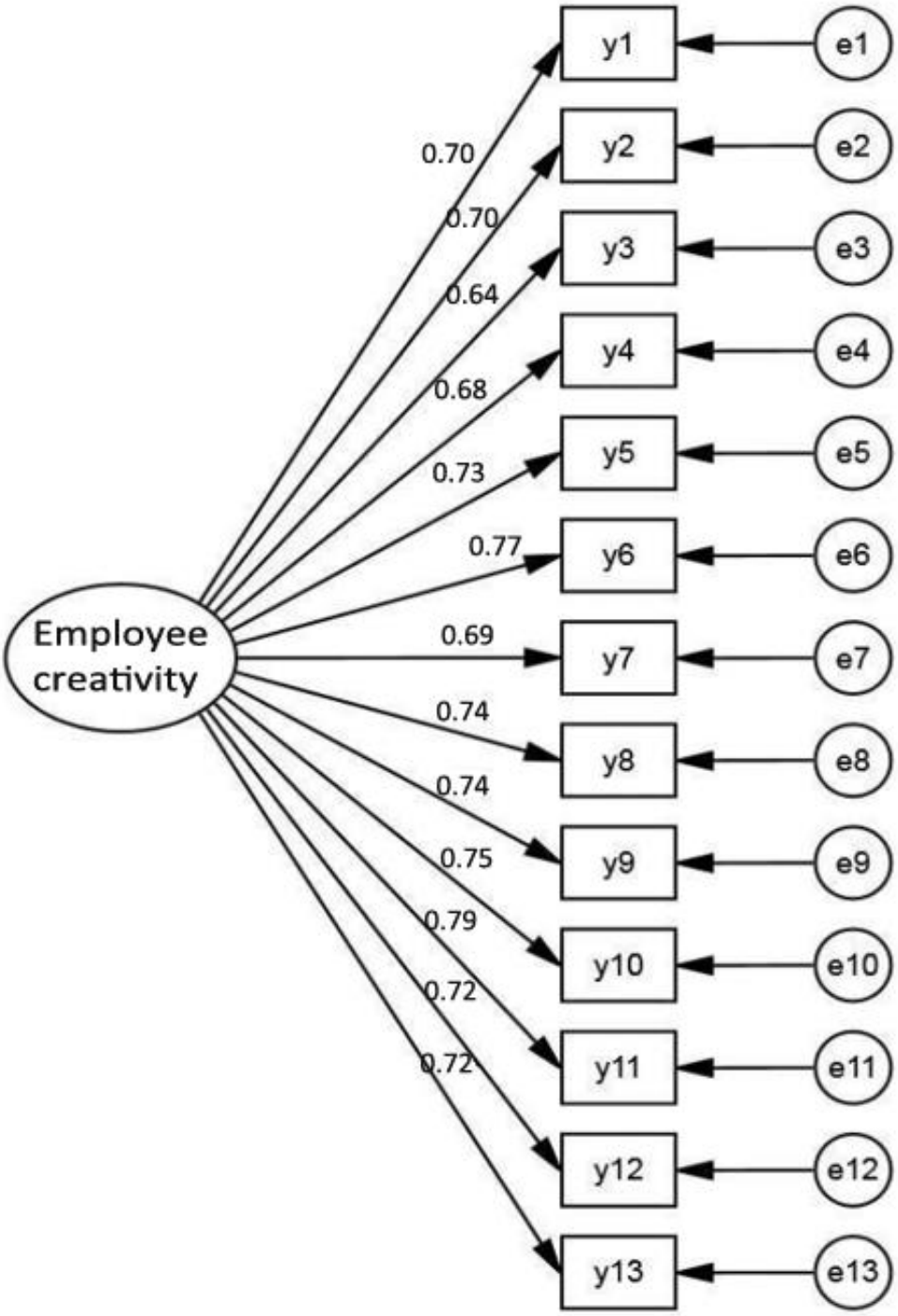

Figure 5. Employee innovation ability CFA.

From the above Figure 5, it can be seen that employee creativity includes 13 items y1-y13, and the factor loadings of them are 0.70, 0.70, 0.64, 0.68, 0.73, 0.77, 0.69, 0.74, 0.74, 0.75, 0.79, 0.72 and 0.72. As these factor loadings are all greater than 0.5 and above 0.7, it indicates that this dimension has good convergence validity.

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Table 7. The fits indices of confirmatory factor analysis.

Fit indices	Ideal value	Result	Fit goodness
CMIN	——	187.886	——
DF	——	65	——
CMIN/DF	<3	2.891	Good
RMR	<0.08	0.034	Good
GFI	>0.8	0.950	Good
AGFI	>0.8	0.931	Good
NFI	>0.9	0.955	Good
IFI	>0.9	0.970	Good
TLI	>0.9	0.964	Good
CFI	>0.9	0.970	Good
RMSEA	<0.08	0.057	Good

As can be seen from Table 7 above, the statistical value of CMIN/DF is 2.891, which falls within the range of the ideal standard value of less than 3. The standards for AGFI, GFI, NFI, TLI, IFI, and CFI are all 0.9 or above, whereas RMR and RMSEA are both less than 0.08 at 0.034 and 0.057, respectively. It can be said that this model is well-fitted because each fitting index complies with general research criteria.

Table 8. Analysis results of confirmatory factors of employee creativity.

Variables	Constructs	Factor loadings	T - value	CR	AVE
Employee creativity	y1	0.697		0.934	0.520
	y2	0.703	15.991		
	y3	0.637	14.538		
	y4	0.68	15.497		
	y5	0.733	16.652		
	y6	0.767	17.380		
	y7	0.691	15.740		
	y8	0.737	16.735		
	y9	0.741	16.837		
	y10	0.747	16.952		
	y11	0.793	17.939		
	y12	0.718	16.329		
	y13	0.717	16.307		

Each employee creative assessment index has a standardized factor load greater than 0.6, as can be seen in Table 8 above. The composition dependability (CR) rating is larger than the recommended threshold of 0.7 at 0.934. The variable has good convergence validity, as indicated by the average variance extracted (AVE), which is 0.52, which is higher than the recommended value of 0.5.

4.4. Correlation Analysis of Transactional Leadership, Psychological Empowerment, and Employee Creativity

The primary focus of correlation analysis is the correlation of variables. The correlation coefficient's range of values is between -1 and 1. The correlation between two variables is stronger when the absolute value is higher.

Based on these criteria, this study will analyze the connection between transactional leadership, psychological empowerment, and employee creativity. The details are in Table 9.

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Table 9. Correlation analysis of transactional leadership, psychological empowerment, and employee creativity.

Variable	Transactional leadership	Psychological empowerment	Employee creativity
Transactional leadership,	1		
Psychological empowerment	0.649**	1	
Employee creativity	0.661**	0.643**	1

Note: **, p<0.01.

Table 9 above clearly showed that transactional leadership and psychological empowerment had a substantial positive association (r = 0.649, p = 0.01). Also, there is a strong positive association between it and employee creativity (r = 0.661, p = 0.01). Employee creativity and psychological empowerment have a substantial positive association (r = 0.643, p = 0.01).

4.5. Regression Analysis

4.5.1. Regression Analysis of Transactional Leadership to Psychological Empowerment

The regression analysis is created as shown in Table 10 by adopting gender, education level, place of birth, monthly income, seniority, title, and department as control variables, transactional leadership as independent variables and psychological empowerment as dependent variables.

Table 10. Regression analysis of transactional leadership to psychological empowerment.

Background variables	Psychological empowerment	
	M1	M2
	B	β
Gender	0.079	0.018
Education level	0.212***	0.081*
Birthplace	-0.040	-0.015
Monthly income	0.096*	0.027
Seniority	0.107**	0.053
Title	-0.048	-0.053
Transactional leadership		0.624***
R^2	0.079	0.435
Adjust R^2	0.068	0.427
F	7.007***	54.495***

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

The R-square for Model 1 in Table 10 above indicates that the explainable variation in psychological empowerment is 7.9%, or 0.079. Education level has a substantial negative impact on psychological empowerment (=0.107, p 0.01), monthly income has a significant positive impact (=0.096, p 0.05), and seniority has a significant positive impact (=0.107, p 0.01). Other than the aforementioned three, no other aspect appears to have an impact on psychological empowerment. With regard to model 2, the R-square is 0.435, indicating that the explainable variance of psychological empowerment is 43.5% and that transactional leadership has a substantial positive effect on psychological empowerment (=0.624, p 0.001), so the hypothesis cannot be ruled out.

4.5.2. Regression Analysis of Transactional Leadership, Psychological Empowerment, and Employee Creativity

By taking gender, education level, birthplace, monthly income, seniority, job title, department as control variables, transactional leadership, psychological empowerment, organizational citizenship behavior as independent variables, and employee creativity as dependent variables, regression analysis is done as shown in Table 11.

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Table 11. Regression analysis of employee creativity.

Background variables	Employee creativity	
	M1	M2
	B	B
Gender	0.088*	0.009
Education level	0.136**	-0.004
Birthplace	-0.048	-0.007
Monthly income	0.083*	-0.023
Seniority	0.151***	0.092**
Job title	0.016	0.035
Transactional leadership		0.339***
Psychological empowerment		0.308***
R^2	0.062	0.552
Adjust R^2	0.051	0.544
F	5.376***	69.663***

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

The R-square for Table 11 Model 1 is 0.062, indicating that the employee's innovation ability's explainable variation is 6.2%. Looking at model 2, it is evident that the R-square is 0.552, reflecting that the explainable variation of employee innovation ability is 55.2%. A closer look reveals that gender (=0.088, p 0.05), education level (=0.136, p 0.01), monthly income (=0.083, p 0.05), and seniority (=0.151, p 0.001) all have significant positive effects on employee creativity, while others have no effect at all. The hypothesis is supported by the considerable positive influence of transactional leadership on employee creativity (=0.339, p 0.001) and the strong positive impact of psychological empowerment on employee innovative ability (=0.308, p 0.001).

4.6. The Analysis of Mediating Effect

According to Baron and Kenny (1986), if we want to add the mediating variable that we want to measure to the direct effect path, it mainly depends on whether the significance of the direct effect changes due to the introduction of mediating variables. If the effect of the original direct path changes from significant to insignificant after the mediating variable is added, then it is a full mediating effect; if the original direct path effect is reduced but still in a significant range after the addition of the mediating variable, then it is called a partial mediating effect. On the contrary, if the significance of the original direct effect does not change, it is called no mediating effect.

4.6.1. Mediating Test of Psychological Empowerment

By taking gender, education level, birthplace, monthly income, seniority, title, and department as control variables, transactional leadership as independent variables, psychological empowerment as a mediating variable, and employee creativity as dependent variable. The Mediating test analysis is shown in Table 12.

First off, it is evident from the aforementioned Table 12 model 2 that transactional leadership significantly affects employee creativity (=0.651, p 0.001). Second, it is demonstrated from model 4 that transactional leadership significantly affects psychological empowerment (p = 0.001, r = 0.624). Thirdly, according to model 5, employee creativity is significantly impacted by psychological empowerment (p = 0.001, r = 0.368). Fourthly, it was found that adding psychological empowerment and transactional leadership to the product regression analysis caused the standardized coefficient of employee creativity to fall from 0.651 to 0.421 while still having a statistically significant impact, indicating that psychological empowerment partially mediates the impact of transactional leadership on employee creativity. Our study hypothesis is supported by this finding; hence, it is sound.

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Table 12. The mediating test of psychological empowerment.

Background variables	Employee creativity		Psychological empowerment		Employee creativity
	M1	M2	M3	M4	M5
	β	β	B	β	β
Gender	0.088*	0.024	0.079	0.018	0.018
Education level	0.136**	0	0.212***	0.081*	-0.030
Birthplace	-0.048	-0.023	-0.04	-0.015	-0.017
Monthly income	0.083*	0.01	0.096*	0.027	0
Seniority	0.151***	0.094**	0.107**	0.053	0.074*
Title	0.016	0.011	-0.048	-0.053	0.030
Transactional leadership		0.651***		0.624***	0.421***
Psychological empowerment					0.368***
R^2	0.062	0.448	0.079	0.435	0.525
Adjust R^2	0.051	0.440	0.068	0.427	0.517
F	5.376***	57.525***	7.007***	54.495***	69.38***

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

5. RESEARCH CONCLUSIONS AND RECOMMENDATIONS

This chapter summarizes the pertinent information, explains the study findings, and offers practical management recommendations based on these findings so that the company can refer to them and draw lessons for future management.

5.1. Research Conclusion

We used SPSS 25 and AMOS statistical software to do reliability analysis, confirmatory factor analysis, correlation analysis, and regression analysis on 576 valid questionnaires for this study. The results showed that all of the research hypotheses were correct.

5.2. Conclusion Discussion

5.2.1. Research Hypothesis Verification and Result Discussion

The results of the regression analysis support the validity of the hypothesis that psychological empowerment has a substantial positive influence on employee creativity (=0.308, p0.001) and that transactional leadership has a significant positive impact on employee creativity (=0.339, p0.001). With the analysis of product regression, the standardized coefficient of employee creativity has dropped from 0.651 to 0.421 but still has a significant impact, asserting that psychological empowerment has the partial mediating effect for the impact on transactional leadership on employee creativity. Thus, the hypothesis stands.

5.3. Research Inspiration

By investigating the impact of transactional leadership on employees' innovation effectiveness through psychological empowerment in two private footwear companies in China, the following suggestions are put forward for the future employment and management of similar companies:

(1) Business leaders must have good professional skills and management capabilities, must treat employees fairly and justly, and strive to give more encouragement, more praise, and less punishment. Put more effort into looking for the merits of employees and appointing them wisely to respected positions so that their skills can be put in to maximum use. Appropriate rewards will be crucial for personnel with outstanding performance, which will in turn enhance team awareness and encourage innovation to work hard for the sustainable operation of the company.

5.4. Research Limitations and Recommendations

5.4.1. Research Limitations

Only typical large and medium-sized private firms in two regions of China were chosen when the questionnaire for this study was released, and small ones were disregarded. Therefore, there exist limitations in terms of reasoning

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and interpretation. In order to study deeper in the follow-up and obtain more valuable data, a wider range of surveys should be conducted on a broad range of subjects.

There are many factors that affect enterprise creativity, such as organizational climate, leadership knowledge management, professional technology, etc. These factors are not discussed in this study, which means that the impact on enterprise creativity is not fully reflected.

5.4.2. Research Recommendations

The research suggestions are as follows: 1. Examine Different Types of Transactional Leadership Styles: Further research can explore the varied effects of different types of transactional leadership styles, such as reward-based and rule-based, on employees' innovation capability. This will help gain a deeper understanding of the effectiveness of various leadership approaches. 2. Investigate Employee Characteristics: The study can consider individual employee characteristics, such as personality traits, experience, educational background, etc., to determine how these traits interact with transactional leadership styles and influence innovation capability. 3. In-Depth Examination of Leader-Employee Interactions: Further investigation can delve into the interaction dynamics between leaders and employees, including factors like communication frequency, feedback mechanisms, etc., and their impact on employees' innovation capability.

FUNDING

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INSTITUTIONAL REVIEW BOARD STATEMENT

The Ethical Committee of the International College, Krirk University, Thailand has granted approval for this study on 17 March 2023 (Ref. No. 2023-0317).

TRANSPARENCY

The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

COMPETING INTERESTS

The authors declare that they have no competing interests.

AUTHORS' CONTRIBUTIONS

The ideas, concepts, and design of the research, the concepts, instruments development and data analysis, W.Z.; the data analysis, and formatting article, X.M.S. Both authors have read and agreed to the published version of the manuscript.

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