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How Does Distributed Leadership Promote Employees' Innovation Behavior: Mediating Role of idiosyncratic deals and Moderating Role of Proactive Personality

Zili Fan
Hubei University of Technology
Yitong Li
Hubei University of Technology
Yige Wu
Henan Polytechnic University
Ting Peng
Hubei University of Technology
Shangju Li
Hubei University of Technology
Jinli Xue (jinlixue03@163.com)
Henan Polytechnic University

Research Article

Keywords: distributed leadership, idiosyncratic deals, proactive personality, innovation behavior

Posted Date: August 11th, 2023

DOI: https://doi.org/10.21203/rs.3.rs-3200084/v1

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Additional Declarations: No competing interests reported.

Abstract

Background

As a new way of leadership, distributed leadership plays an important role in dealing with complex external environment, optimizing organizational decision-making and promoting employee participation. Based on social cognitive theory, this paper reveals how distributed leadership promotes employees' innovation behavior through idiosyncratic deals, as well as moderating role of proactive personality in this process.

Methods

In order to reduce the effects of common method biases and causal lag effect, this study was divided into three stages for data collection, with a time interval of half a month. 321 employees from 7 enterprises in Wuhan, China were selected as samples. Hypothesis test was carried out by Linear Regression method, Bootstrap method and Johnson-Neyman method.

Results

The results show that distributed leadership is positively related to innovation behavior; distributed leadership has a positive impact on innovation behavior through idiosyncratic deals; proactive personality positively moderates the relationship between distributed leadership and idiosyncratic deals, and further moderates mediating effect of idiosyncratic deals between distributed leadership and innovation behavior.

Conclusion

This paper expands the research perspective of distributed leadership, indicating that it can not only support employees from top to bottom, but also enable employees to actively negotiate idiosyncratic deals with the organization from bottom to top, which promotes the enthusiasm and initiative of employees in innovation. This provides theoretical basis and practical enlightenment for managers to adopt distributed leadership.

0 Introduction

With the advent of the VUCA era, ambiguity, complexity, uncertainty and variability have become prominent features in modern market competition. Faced with the ever-changing external environment, the flat organizational structure and flexible management strategy are favored by more and more enterprises[1], which also means that leaders need to have a huge amount of cross-border knowledge reserves, strong energy and strategic vision that is flexible according to the market. However, the energy and time of leaders are limited, and they cannot be outstanding in all fields. It is difficult for leaders to make decisions in the face of many tasks they are not good at[2]. Therefore, how to optimize the allocation of human capital in enterprises, liberate leaders from the areas they are not good at, fully mobilize the talents of subordinates has become the focus of this paper.

In the past, the traditional management concept ignored the importance of knowledge heterogeneity and liquidity of leadership[3]. Leaders were driven to the market and assigned to areas where they were not good at, while a large number of talented and good at this field were buried in the miscellaneous daily work day after day[4]. With the continuous awakening of employees' self-consciousness, they are more eager to make full use of their talents in work. They are no

longer willing to accept leadership passively, but actively put forward their demands to leaders or organizations[5]. Therefore, managers began to rethink whether there is leadership mode that can realize the rotation of leadership, let employees with relevant knowledge background assume certain leadership functions and give full play to their knowledge heterogeneity. In order to deal with this problem, this paper uses a new style of leadership, namely distributed leadership. As an emerging leadership style, distributed leadership is conducive to breaking the barriers of ranks and driving the flexible flow of high-quality human capital between the upper and lower levels, which may be an important breakthrough to solve the above problems.

As a new generation of employees in the modern workplace, they are highly goal-driven, generally show the characteristics of high knowledge, high education, high flexibility, have strong learning ability and self-realization needs, and will take corresponding actions according to the recognition and evaluation of the objective environment, and finally achieve their goals. This situation provides the chance for the application of distributed leadership[6]. This emerging leadership method uses the method of advocating role exchange and responsibility sharing to let subordinates assume certain leadership responsibilities in their own areas of expertise[7], which is conducive to the employees who have self-realization needs stand out in the team and take the initiative to negotiate with their superiors a idiosyncratic deals that is more suitable for their talents, which makes them actively seek new ideas and new methods to solve problems when dealing with personalized work content that is more compatible with their own, thus promoting the innovation behavior of employees.

In addition, whether an individual can take action actively under the goal-driven and external environment cognition will also be affected by individual characteristics[8]. Among them, proactive personality, as an important individual trait, plays an important role in the promotion process of distributed leadership to employees' innovation behavior. Employees with a high proactive personality tend to be more forward-looking about the future, more revolutionary about the current situation, and more active and persistent in the face of goals[9]. Therefore, such employees are more willing to accept the distributed leadership style, and more responsive to the distributed management of leaders, and will actively explore new technologies and methods to achieve or even exceed the organization's expectations.

To sum up, this paper constructs a moderated mediating model based on social cognitive theory, as shown in Fig. 1. The purpose is to explore the relationship between distributed leadership and employees' innovation behavior, and pay attention to the mediating and moderating role played by idiosyncratic deals and proactive personality in this process mechanism, so as to provide more theoretical inspiration and practical guidance for the superiors to adopt distributed leadership.

1 Literature review and hypothesis deduction

1.1 Distributed leadership and innovation behavior

According to social cognitive theory, individuals formulate corresponding plans through their cognition of the external environment, and then take specific actions to achieve this goal[10]. In the workplace environment, the leadership style adopted by superiors is one of the main external environments perceived by employees, and also an important antecedent variable affecting employees' behavior[11]. Employees will develop different action plans according to different leadership styles. Distributed leadership, a dynamic and interactive way of leadership, emphasizes "role exchange and responsibility sharing", provides an acceleration channel for the professional promotion of employees[12], which makes a large number of new generation employees' heterogeneous talents play across ranks, which increase employees' innovative self-efficacy and stimulate employees to take initiative in innovation[13]. Therefore, this paper believes that the

distributed leadership style adopted by superiors is conducive to motivating employees to actively adopt new ideas and new ways to solve problems creatively.

To be specific, first of all, with the popularity of the Internet, online office has become the norm of modern enterprises. The new generation of employees have gradually adapted to the characteristics of the low power distance in the online world[13], and do not blindly follow the authority. The distributed leadership has blurred the power boundary between the upper and lower levels, so that the subordinates can spend more energy on improving performance and self-growth, rather than dealing with various human relationships, which also enables employees to truly feel the value of work, and then show more initiative to innovate[14]; Secondly, the new generation of employees generally have higher education, but lack of practical exercises. Distributed leadership can enable employees to play leadership roles in their fields of expertise, and promote their rapid growth and goal realization[15]. This increases their innovative self-efficacy on the basis of improving their ability, and makes them more confident to engage in innovation behaviors beneficial to the organization; Finally, the new generation of employees have distinctive personalities and desire a free, open and fair working environment[16]. Distributed leadership provides them with an open and fair working environment, encourages employees to conduct self-management, cultivates employees' positive, optimistic and healthy psychological state[17], and promotes them to spontaneously take innovative actions in an open working environment. Based on this, this paper puts forward the following assumptions:

H1: Distributed leadership is positively related to innovation behavior.

1.2 The mediating role of idiosyncratic deals

First of all, distributed leadership emphasizes the need to respect the heterogeneity of employees' knowledge, empower talented employees, and let them play a certain leadership role in their fields of expertise[18], so as to provide more opportunities for the display of employees' heterogeneous talents[19]. idiosyncratic deals are non-standard work arrangements that employees actively propose and negotiate with their superiors and organizations based on their special talents. Therefore, In the face of distributed leadership, employees may have more opportunities to show their special talents to the organization, and will take the initiative to negotiate with their superiors idiosyncratic deals that are conducive to giving play to their special talents, so as to stimulate their self-efficacy when dealing with idiosyncratic deals, and then, which will make employees actively explore innovative work methods, and display more innovation behaviors.

Secondly, distributed leadership is one of the manifestations of superior support[20]. Some scholars have found in empirical research that the adoption of distributed leadership by managers is more conducive to the transmission of support and care to subordinates[21], which will make subordinates realize that this is the cultivation and recognition of the organization. Therefore, employees also will be more confident to actively prove their talents to the organization and seek job opportunities that are more suitable for their own advantages. In these jobs, employees will have more sense of achievement and organizational self-esteem, and employees will be willing to spend more energy and time to study the tasks, and constantly optimize and upgrade their solutions[22].

Finally, distributed leadership blurs the rank boundary between superiors and subordinates, advocates the management concept of dynamic interaction and shared responsibility, which is reflected in the vertical influence of superiors and subordinates as well as the horizontal influence between colleagues, so as to achieve team goals. Employees will realize that in this open and equal organizational atmosphere, it is more beneficial for them to put forward idiosyncratic deals to the organization, and in the face of personalized work content that is more suitable for them, employees will also be

more willing to change their attitude, that is, from what I was forced to do to what I want to do, and actively take innovative behavior. Based on this, this paper puts forward the following assumptions;

H2: Distributed leadership is positively related to idiosyncratic deals

H3: Idiosyncratic deals mediate the relationship between distributed leadership and innovation behavior, that is, distributed leadership positively affects idiosyncratic deals, and then promotes innovation behavior.

1.3 The moderating role of proactive personality

The social cognition theory further points out that in the process of social cognition and taking corresponding actions, the difference of individual characteristics will affect their judgment of the external environment, and the difference of judgment will affect the individual's self-cognition, and then affect the subsequent behavior[23]. Unlike the passive personality who endure the current situation and adapt to the environment, individuals with the trait of proactive personality are more inclined to actively recognize the objective environment, and actively identify opportunities according to their own cognition, and find the right time to change the current situation[24]. Thus, we infer proactive personality may be moderating role in the impact of distributed leadership on innovation behavior

Firstly, employees with high proactive personality have the quality of persevering for goals, have a very clear plan for their career, and can be specifically implemented in action and fully put into work. Therefore, when facing distributed management, such employees will be more proactive in applying to their superiors for idiosyncratic deals that is more consistent with their abilities, while increasing their internal motivation, Improve innovative self-efficacy, and then employees are more willing to take innovation behavior.

Secondly, change-oriented is a typical characteristic of proactive personality. Such employees will not be satisfied with the status quo and like challenging work content. Faced with the open power and responsibility management system of distributed leadership, proactive employees will be more confident to propose to the leadership to assume certain leadership functions, and then carry out relatively difficult, challenging and personalized work content, and apply their relevant professional knowledge to actual management, and adopt new ideas new technologies and new methods are constantly iterated and upgraded to optimize the work efficiency.

Finally, employees with high proactive personality will pay more attention to their future growth, and taking precautions is their thinking inertia. In the face of today's competitive and innovative market environment, they are more aware that the traditional standardized human resource management model is no longer suitable for this rapidly changing market. They are more willing to add non-standard management strategies on the basis of previous management, seize the opportunity for leaders to adopt distributed management, and put forward their own requirements to the organization, And after getting idiosyncratic deals, they will fully show their uniqueness and heterogeneity, apply what they have learned to the actual management of the enterprise, and take forward-looking innovative actions to make up for the past management loopholes of the organization. Accordingly, the following assumptions are proposed in this paper:

H4: Proactive personality positively moderates the relationship between distributed leadership and idiosyncratic deals, that is, the higher proactive personality, the stronger impact of distributed leadership on idiosyncratic deals.

H5: Proactive personality positively moderates the mediating role of idiosyncratic deals, that is, the higher proactive personality is, the stronger indirect effect of distributed leadership on innovation behavior through idiosyncratic deals.

2 Participants and Methods

2.1 Participants and Procedures

This study uses the questionnaire survey method to collect samples, conduct in-depth observation in enterprises, and distribute and collect the questionnaires on site. The survey period is from October to November 2022. The respondents are employees from seven enterprises in Wuhan, China. Considering that distributed leadership and idiosyncratic deals are relatively emerging leadership methods and management strategies, enterprises are required to have a relatively flat organizational structure and flexible management methods, so the types of enterprises are mainly concentrated in Internet enterprises. Time1, Time2, and Time3 are used to measure the time points in order of half a month, among which Time1 measures gender, age, education, tenure, distributed leadership and proactive personality, Time2 measures idiosyncratic deals, and Time3 measures innovation behavior. A total of 437 questionnaires were distributed and 338 questionnaires were recovered. After recovery, 17 invalid samples were removed. Finally, a total of 321 valid questionnaires were collected, with an effective recovery rate of 73.46%.

The characteristics of the sample are: in terms of gender, 195 men (60.74%) and 126 women (39.26%); In terms of age, 109 people aged 20-25 (33.95%), 93 people aged 26-30 (28.97%), 89 people aged 30-35 (27.72%), and 30 people aged 35-40 (9.36%); In terms of age, 105 people (32.71%) in 1-5 years, 122 people (38.01%) in 6-10 years, 49 people (15.26%) in 11-15 years, and 45 people (14.02%) in 16-20 years; In terms of education, the number of undergraduate students is the highest, 165 (51.40%).

2.2 Measures

We controlled for the effects of demographic characteristics such as gender, age, education and tenure. The questionnaire used the 5-level Likert scale, ranging from 1(strongly disagree) to 5(strongly agree).

Distributed Leadership. Using the nine-item scale developed by Chang[25]. A sample item is:“ supervisor encourages colleagues to boldly display their strengths and not be afraid of making mistakes”. Cronbach’s alpha was 0.897.

Idiosyncratic Deals. Using the six-item scale developed by Hornung et al[26]. A sample item is:“ I requested and successfully negotiated special opportunities for learning skills”. Cronbach’s alpha was 0.945.

Proactive Personality. Using the six-item scale developed by Bateman et al[27]. A sample item is:“ I will make corrections when I see something I don't like”. Cronbach’s alpha was 0.890.

Innovation Behavior. Using the six-item scale developed by Scott et al[28]. A sample item is:“ I always seek to apply new processes, technologies and methods”. Cronbach’s alpha was 0.916.

Control Variables. In order to avoid the interference of the causal relationship between variables in this paper by demographic variables, the influence of demographic variables such as gender, age, education and tenure on the research was controlled.

2.3 Statistical Analysis

Firstly, we used AMOS 24.0 to conduct confirmatory factor analysis (CFAS), and then used SPSS 24.0 to provide descriptive statistics, including mean, standard deviation and correlation matrix. Then, based on the code provided by Edward et al.[29] and Preacher et al.,[30] MPLUS 7.4 software is used for hypothesis testing, in which bootstraps is 5000. In

addition, Johnson-Neyman (J-N) method is used to optimize the moderating effect test by providing confidence intervals for a simple slope rather than tracing point method.

3 Results

3.1 Confirmatory Factor Analyses

The confirmatory factor analysis was used to evaluate the differentiated validity of the four main variables: distributed leadership, proactive personality, idiosyncratic deals and innovation behavior, and the fitting indexes between the models were compared and analyzed. The results of confirmatory factor analysis showed that the fitting of the four-factor model was superior to other models, and all indicators met the requirements of the judgment criteria (X^2/df=1.824, *CFI*=0.957, *TLI*=0.952, *RMSEA*=0.050, *SRMR*=0.034). The results showed that the discriminant validity of variable measurement was high, and the four-factor model was the best fit model.

In order to evaluate its potential impact, we added common method factors on the basis of the four-factor structure and built a five-factor model structure, drawing on the practice of Podsakoff et al.[30]. The results have improved (X^2/df=1.622, *CFI*=0.976, *TLI*=0.971, *RMSEA*=0.032, *SRMR*=0.020), indicating that there is a certain degree of common method deviation. However, by comparing the models before and after the control of potential factors, the improvement of *RMSEA*, *CFI*, *TLI* and other indicators is limited, less than 0.02, indicating that the common method deviation will not pose a threat to the interpretation of the research results.

3.2 Descriptive Statistics

The mean value, standard deviation and correlation coefficient between variables are shown in **Table 1**, and the correlation coefficient between variables is less than 0.7. In Table 1, distributed leadership is significantly positively correlated with innovation behavior (r=0.329, p<0.001); There was a significant positive correlation between distributed leadership and idiosyncratic deals (r=0.419, p<0.001); There was a significant positive correlation between idiosyncratic deals and innovation behavior (r=0.335, p<0.001). The results preliminarily support H1, H2 and H3.

Table 1 Means, Standard Deviations, and Correlation Matrix for Key Measures

Variables	*M*	*SD*	1	2	3	4	5	6	7
1.Gender	1.611	0.488							
2.Age	2.121	0.988	0.075						
3.Education	2.389	0.825	0.162**	0.333***					
4.Tenure	2.890	1.015	-0.058	-0.157**	0.033				
5.Distributed leadership	3.086	0.931	0.052	0.078	0.189**	0.209***			
6.Idiosyncratic deals	3.610	1.085	0.008	0.012	0.143**	0.202***	0.419***		
7.Proactive personality	3.558	0.946	0.046	0.092	0.122*	0.065	0.234***	0.259***	
8.Innovation behavior	2.781	0.771	0.213***	0.341***	0.441***	0.064	0.329***	0.335***	0.202***

Notes: N=321; *p<0.05;**p<0.01; ***p<0.001

3.3 Hypothesis Testing

This paper uses hierarchical regression and uses Spss22.0 and Mplus7.0 as analysis tools to verify the above assumptions[31,32]. The results of hierarchical regression analysis are shown in **Table 2**.

Table 2 Hierarchical Regression Results

Variables	Idiosyncratic deals				Innovation behavior			
	Model 1		Model 2		Model 3		Model 4	
	β	*s.e*	*β*	*s.e*	*β*	*s.e*	*β*	*s.e*
Intercept	-0.472	0.305	-0.301	0.301	-1.484	0.208	-1.411	0.195
Gender	-0.033	0.113	-0.073	0.111	0.218**	0.074	0.224**	0.072
Age	-0.028	0.059	-0.037	0.058	0.169***	0.038	0.174***	0.037
Education	0.101	0.072	0.079	0.069	0.279*	0.046	0.262**	0.045
Tenure	0.118*	0.055	0.095	0.055	0.035	0.036	0.016	0.035
Distributed leadership	0.449***	0.061	0.349***	0.067	0.197***	0.039	0.126**	0.041
Proactive personality			0.204**	0.048				
Distributed leadership*Proactive personality			0.155*	0.051				
Idiosyncratic deals							0.157***	0.035
R^2	0.194		0.236		0.317		0.345	
ΔR^2	0.194		0.041		0.317		0.027	
F	15.288***		13.916***		29.388***		29.165***	

Notes: *N*=321; *p<0.05;**p<0.01; ***p<0.001

H1 aims to study the direct relationship between distributed leadership and innovation behavior. Model 3 in Table 2 shows that distributed leadership has a significant positive impact on employee innovation behavior (β= 0.197, p<0.001), thus H1 is verified;

Then, according to the method of Baron et al.[33], we test the mediating effect. Model 3 in Table 2 shows that distributed leadership has a significant positive impact on innovation behavior (β= 0.197, p<0.001), model 1 shows that distributed leadership has a significant positive impact on idiosyncratic deals (β= 0.449, p<0.001), model 4 shows that, compared with model 3, the positive impact of distributed leadership on innovation behavior decreases, but it is still significant (β= 0.126, p<0.001), indicating that idiosyncratic deals play a mediating role between distributed leadership and innovation behavior. Therefore, both H2 and H3 are verified.

In order to further test the significance of the mediating effect, this paper uses the Bootstrap method to test mediating effect according to the suggestion of Wang et al.[34]. The number of Bootstrap samples is 5000. Mediating effect value is 0.066, 95%IC is [0.036, 0.123], excluding 0. The result further shows that idiosyncratic deals play a mediating role between distributed leadership and innovation behavior.

H4 aims to reveal the moderating effect of proactive personality. Model 2 in Table 2 shows the interaction coefficient between distributed leadership and proactive personality (β= 0.155, p<0.05). The proactive personality positively moderates the relationship between distributed leadership and idiosyncratic deals, thus H4 is verified.

In order to further verify the moderating effect of proactive personality, we used Johnson-Neyman (J-N) method to explore the specific form of regulatory effect. The J-N method makes up for the deficiency of the test adjustment effect of tracing point method, and helps us to mine more information by providing a simple slope confidence band. The results are shown in **Figure 2**. For the part with proactive personality greater than -0.994, the confidence band of the simple slope line is above the 0 axis, which is significant. Because the slope line is greater than 0 and the whole slope is inclined to the right and upper, it means that with the increase of proactive personality, the positive role of distributed leadership on personalized work protocols is enhanced.

H5 predicted proactive personality moderated the mediating effect of idiosyncratic deals between distributed leadership and innovation behavior. This paper uses Mplus7.0 as the analysis tool according to the moderated mediating effect test method[34] and the auxiliary test documents provided by Edwards et al.[29]. The results are shown in **Table 3**.

Table 3 Analysis Results of Moderated Mediating Effect (Proactive Personality)

Variable		First stage	Second stage	Direct effect	Indirect effect	Total effect
		X→M	M→Y	X→Y	P_{YM}*P_{MX}	P_{YX}+ [P_{YM}*P_{MX}]
		[95% CI]	[95% CI]	[95% CI]	[95% CI]	[95% CI]
Proactive personality	high	0.535	0.252	0.249	0.135	0.384
		[0.417, 0.644]	[0.122, 0.372]	[0.143, 0.351]	[0.027, 0.131]	[0.227, 0.418]
	low	0.213	0.028	0.028	0.006	0.034
		[-0.032, 0.442]	[-0.088, 0.156]	[-0.142, 0.188]	[-0.002, 0.084]	[-0.109, 0.219]
	difference	0.321	0.224	0.224	0.129	0.350
		[0.077, 0.582]	[0.046, 0.411]	[0.046, 0.411]	[0.011, 0.107]	[0.091, 0.439]

Notes: *p<0.05;**p<0.01; ***p<0.001

According to Table 3, under the high proactive personality, the 95%IC of indirect effect is [0.027, 0.131], excluding 0; Under the low proactive personality, the 95%IC of indirect effect is [-0.002, 0.084], including 0; However, under the conditions of high and low proactive personality, the indirect effect is significantly different ($\Delta\gamma$= 0.129), 95%IC is [0.011, 0.107], excluding 0. It can be seen that proactive personality will strengthen the mediating role of idiosyncratic deals between distributed leadership and innovation behavior. Thus, H5 is verified.

4 Discussion

4.1 Theoretical Implications

Firstly, when previous scholars studied leadership, most of them were based on the assumption that employees are born to be led by their superiors, and demonstrated it from the perspective of relationship theory, behavior theory and trait

theory[35]. However, this study believes that employees are not born to want to be led, especially the new generation of employees after 80 and 90 who are more proactive and eager for their talents to be fully used in the organization. Therefore, this paper follows the emerging leadership style of distributed leadership and proposes that leadership should not be fixed, but mobile. In addition to the unilateral declaration of leaders, the legitimacy of leadership also requires the authorization of employees[8], which not only challenges the traditional management concept of leadership first to provide new ideas and methods for the new generation of employees to realize their self-worth, but also opens up a new theoretical perspective for enterprises to adapt to the rapidly developing market environment in the future.

Secondly, idiosyncratic deals characterized by non-standard and customization is used as an mediating role to further demonstrate the positive impact of distributed leadership in mobilizing the enthusiasm of subordinates to promote their initiative to take innovative behaviors. Previous studies mainly discussed from social exchange[36], organizational support[37] and so on, which remained at the psychological abstract level and lacked practical proof and agreement. As a result, it made the relationship unstable. Starting from the rigid institutional level, this paper takes the idiosyncratic deals as a concrete work agreement as mediating variable, providing guidance for the implementation of leadership style. In addition, the antecedent variables and outcome variables of idiosyncratic deals were further explored. Previous studies focused on the impact of individual characteristics of employees on idiosyncratic deals[38-41]. In the meta-analysis of idiosyncratic deals, Liao et al.[42] pointed out that leadership is the important factor that should be considered in the future of idiosyncratic deals, and should try to explore this emerging non-standard work arrangement from multiple perspectives. Therefore, in response to this call, this paper fills in this theoretical gap, and uses distributed leadership as a antecedent variable to explore its role in promoting idiosyncratic deals.

Finally, existing research shows that proactive personality can effectively predict idiosyncratic deals and innovation behavior, but most of them use it as an independent variable to explore how proactive personality to stimulate employees' positive work attitude and behavior. However, it is rarely used as a moderating role to explore its interference with the leadership type and the mechanism of employee behavior. This paper verifies through empirical analysis that when the superior adopts the emerging leadership style of distributed leadership, employees with high proactive personality will actively respond to this leadership style, are more willing to negotiate idiosyncratic deals, and stimulate employees' innovation behaviors, which corroborates Parker's theoretical research on proactive personality.

4.2 Practical Implications

Firstly, in actual management, leaders need to clearly understand themselves, know what they can do, and also know what they can't do. They should dare to give up leadership in areas they are not good at, and let employees with corresponding knowledge backgrounds assume leadership responsibilities, which can not only reduce pressure for themselves, but also inspire employees to actively play their heterogeneous talents, help talented employees stand out in the enterprise and retain truly valuable talents for the enterprise..

Secondly, enterprises should sign idiosyncratic deals with employees according to their knowledge heterogeneity and the actual market environment. However, this kind of customized special work content is not the normal situation of enterprises. idiosyncratic deals are an important supplement to the standardized human resources of enterprises, but can not replace the standardized work arrangement. Moreover, this non-standard work agreement is also implemented by a small number of core employees who can bring high value to the enterprise[10], However, the adoption of idiosyncratic deals for front-line employees with strong substitutability will result in higher labor costs. Therefore, when adopting this emerging work agreement, managers should not generalize but tailored according to actual developmental demand of the enterprise.

Finally, in practical operation, it is necessary to pay attention to the individual characteristics of employees, and select as many employees with high proactive personality as possible for distributed management, so as to promote the efficient flow of high-quality human capital in enterprises. what`s more, when selecting and evaluating talents, enterprises can also investigate their proactive internal quality as much as possible, provide employees' savings for the play of distributed leadership, and promote this efficient leadership style to be better implemented and implemented in actual enterprise management.

4.3 Limitations and Directions for Future Research

This study contains the following limitations, which can be further improved in future research.

Firstly, this paper adopts a multi-period survey method to reduce the impact of common method deviation to a certain extent. However, the process of promoting employees' innovation behavior by distributed leadership has a certain time interval. Therefore, the time dimension will be added in the follow-up research, and the log method will be used to track and record the progress and changes of distributed leadership in promoting innovation behavior. Moreover, the innovation behavior does not mean that it can produce actual beneficial results for the organization. Whether the innovation behavior conforms to the actual situation of the organization, and whether it can be successfully translated into actual production benefits are the key issues to be considered in the follow-up study.

Secondly, in this study, although proactive personality is considered as an individual trait of employees, the scope is relatively narrow. Therefore, more individual characteristics of these excellent employees will be considered in the subsequent research, such as traditionality, modernity, etc.

Thirdly, this study does not strictly distinguish the types of idiosyncratic deals (developmental I-deals, task I-deals, flexible I-deals, Financial I-deals, etc.). Because of the different types of idiosyncratic deals, the impact of the idiosyncratic deals on employees' innovation behavior will also be different[43], which provides a new theoretical perspective for further exploring the impact of idiosyncratic deals on innovation.

Finally, based on social cognitive theory, this paper only discusses the mediating role of idiosyncratic deals and the moderating role of proactive personality. Subsequent research can also explore the role of other incentives (such as psychological empowerment, organizational self-esteem and perceived insider status) in the relationship between distributed leadership and employees' innovation behavior, as well as other work-related results (such as productivity, work quality, etc.).[44]

5 Conclusion

Distributed leadership is a new way of leadership, which plays a important role in today's market environment that advocates talent competition and innovation-driven development. Through empirical research, the results show that distributed leadership is positively related to innovation behavior; idiosyncratic deals mediate the relationship between distributed leadership and innovation behavior, that is, distributed leadership has a positive impact on innovation behavior through idiosyncratic deals; The proactive personality positively moderates the relationship between distributed leadership and idiosyncratic deals, and further moderates the mediating role of idiosyncratic deals between distributed leadership and innovation behavior.

Declarations

Acknowledge

The authors are grateful to all the participants who took part in this study.

Authors' contributions

Zili Fan and Jinli Xue conceptualized the study. Validation and study methodology was prepared by Yitong Li. Formal statistical analysis and data curation was conducted by Yige Wu. Original draft preparation was prepared by Zili Fan. Ting Peng and Shangju Li reviewed and edited the manuscript. Overall, study was supervised by Zili Fan and Jinli Xue. All authors have read and agreed to the published version of the manuscript.

Availability of data and materials

The data are not publicly available due to restrictions, their containing information that could compromise the privacy of research participants.

Ethics approval and consent to participate

Before starting our research, we submitted our research plan to the Academic Ethics Committee of the School of Economics and Management of Hubei University of Technology, and obtained the moral approval and review of the content of the plan. All the participants willingly took part in the questionnaire survey and written informed consent was provided by the participants and institutions.

Consent for publication

Not application.

Competing interests

The authors declare that they have no potential conflict of interest in the publication of this research output.

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Figures

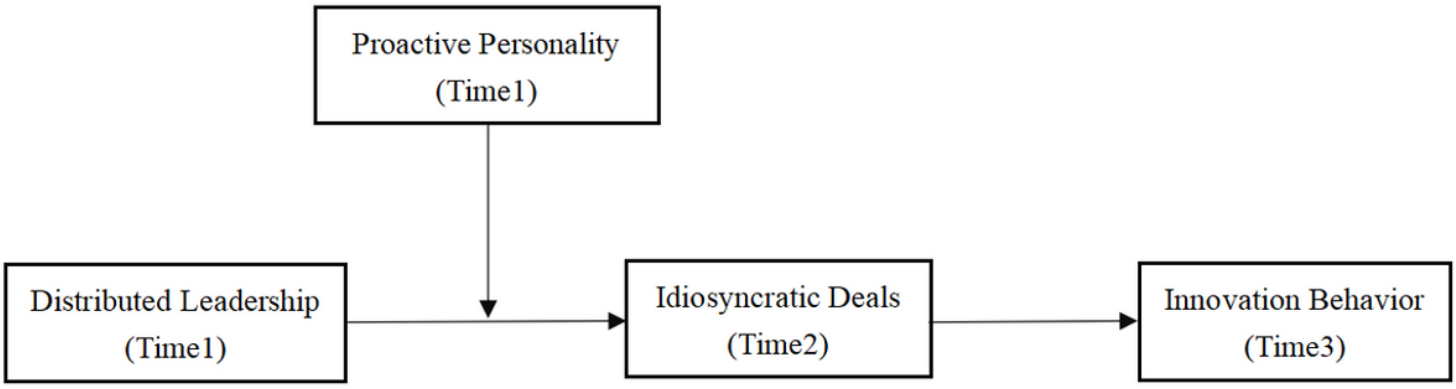


Figure 1

Theoretical model

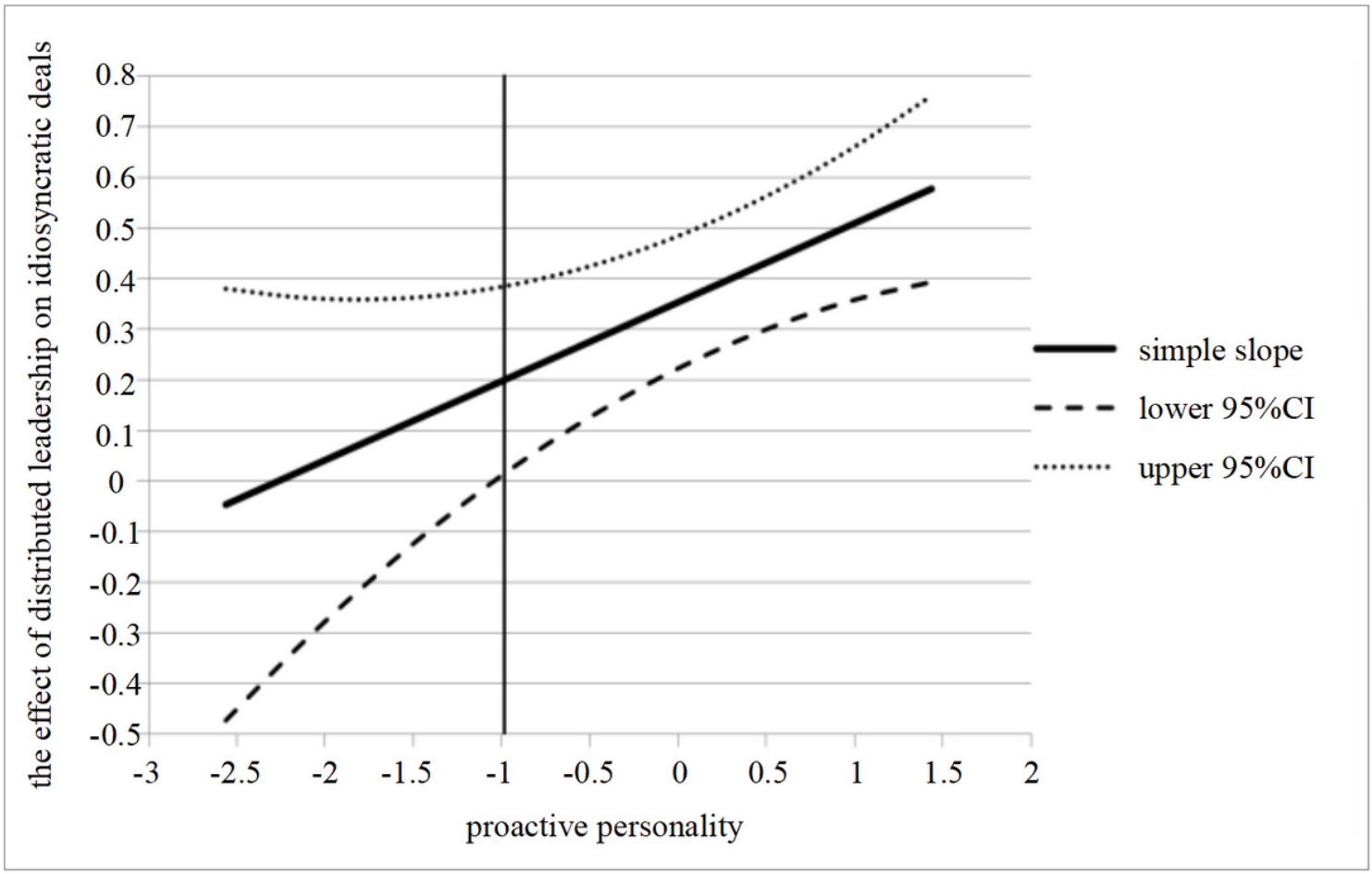


Figure 2

The Moderating Role of Proactive Personality (J-N)