Dual Leadership, Social Network and University Research Team Innovation Performance

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Abstract. Based on the dual leadership theory and social network theory, the research model of "Dual Leadership—Team Social Network—Research Team Innovation Performance" was established. 420 samples from various universities were used as survey objects, and multiple regression analysis methods were used. The data was analyzed with a structural equation model. The results show that: (1) The dual leadership and its two dimensions are significantly positively correlated with the innovation performance of university research teams; (2) the internal social network of the team does not play a mediating role in the imperative leadership and the innovation performance of the university research team; The external social network of the team plays a partial intermediary role between the dual leadership and its sub-dimensions and the innovation performance of the research team in the university; (4) The differentiation of the leadership-member exchange relationship is negative between the dual leadership and the innovation performance of the university research team to adjust.

Introduction

Existing research shows that the leadership style of the instructor influences the behavior of the research team members, and thus plays an important role in the innovation performance of the university research team. Jinlian Luo and et al.\textsuperscript{[1]} based on public opinion, proposed that dual leaders have flexible cognitive and behavioral methods, which help organizations to cope with tensions and break through management dilemmas; Han Yang (2016) constructed an impact model of dual leadership behavior—team dual culture—team innovation performance, which verifies the positive impact of dual leadership on team innovation performance\textsuperscript{[3]}. As an important factor affecting the performance of scientific research and innovation, the dual leadership needs leaders to balance the normative and breakthrough of innovation, solve the contradictory dilemma, and stimulate the overall innovation vitality of the team.

Based on the theory of leadership, social network theory and innovation theory, this paper introduces the social network of the team and the contradiction of dual leadership. Through empirical research, it is confirmed that the dual leadership style has a greater promotion in the innovation process of university research teams. The paper reveals the mediating role of the team social network and the adjustment role of the leadership-member exchange relationship differentiation.

Theory and Assumptions

(1) The dual-headed leadership is a leadership model that uses a contradictory force to balance the balance of leadership strategies in a complex and ever-changing environment. In view of the relationship between the dual leadership and the innovation performance of the research team, based on the research results of the existing literature, the following hypotheses are proposed:

H1: The dual leadership has a significant positive impact on the innovation performance of university research teams.
H1a: Authorized type leadership has a significant positive impact on the innovation performance of university research teams.

H1b: Command-style leadership has a significant positive impact on the innovation performance of university research teams.

(2) The internal social network of the team refers to the various relationship network structures formed among the team members. The greater the density of social networks within the team, the higher the frequency of information exchange. The more favorable it is for team members to form friendly relationships that depend on each other, and to create innovative ideas. Therefore, in response to the mediating role of social networks within the team, this paper proposes the following assumptions:

H2: The dual leadership has a positive impact on the internal social network of the team.
H2a: Authorized leadership has a positive impact on the internal social network of the team.
H2b: Imperative leadership has a positive impact on the internal social network of the team.

H3: The internal social network of the team has a positive impact on the innovation performance of the research team.

H4: The internal social network of the team plays a mediating role between the dual leadership and the innovation performance of the research team.
H4a: The internal social network of the team plays a mediating role between the imperative leadership and the innovation performance of the research team.
H4b: The internal social network of the team plays a mediating role between the authorized leadership and the innovation performance of the research team.

(3) Team external social network is a network structure of various relationships formed between team members and non-team members. The external social network of the team has a higher level of heterogeneity and diversity than the internal social network of the team, which can promote the generation of innovation performance [7]. Therefore, in response to the mediating role of social networks outside the team, this paper proposes the following assumptions:

H5: The dual leadership has a positive impact on the social network outside the team.
H5a: Authorized leadership has a positive impact on the social network outside the team.
H5b: Imperative leadership has a positive impact on the social network outside the team.

H6: The external social network of the team has a positive impact on the innovation performance of the research team.

H7: The team social network plays a mediating role between the dual leadership and the innovation performance of the research team.
H7a: The external social network of the team plays a mediating role between the imperative leadership and the innovation performance of the research team.
H7b: The external social network of the team plays a mediating role between the authorized leadership and the innovation performance of the research team.

(3) Under the traditional power situation in China, the attitudes and behaviors of leaders have an important influence on the development of team members. Team leaders adopt an imperative leadership behavior model that deprives team members of the enthusiasm and initiative to actively acquire the necessary resources, which adversely affects innovation performance. Therefore, this paper proposes the following assumptions:

H8: Leadership-member exchange relationship differentiation has a negative adjustment effect between the dual leadership and the innovation performance of the research team.

Based on the above assumptions, the research model obtained in this paper is shown in Figure 1.
**Research Methods and Data Analysis**

This paper draws on the maturity scale of relevant variables research at home and abroad for questionnaire design. Among them, The dual leadership scale adopts the measurement system of command-style leadership and authorized leadership by GEBERT D & BOERNER S et al.\(^8\), combined with the behavioral scale of public opinion leadership developed by Zhang, targeted adjustments and modifications in the local context, resulting in the formation of 17 items with two dimensions: imperative leadership and authorized leadership. In this study, 500 questionnaires were distributed online and offline, and 420 valid questionnaires were finally collected after eliminating the invalid questionnaires.

In this paper, SPSS is used to analyze the reliability and exploratory factor of the scale, and AMOS is used to verify the factor of the variable. The results of the confirmatory factor analysis are consistent with the model's adaptation criteria. It is further calculated that the convergence validity of the model meets the requirements.

<table>
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<th>Variables</th>
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<th>TW</th>
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<th>LC</th>
<th>TC</th>
<th>C</th>
<th>JH</th>
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Note: The test is Pearson-related double test, *** indicates correlation at 0.001 significance level, and ** indicates correlation at 0.01 level.

This study conducted a hypothesis test on the above model. The main effect test of the dual leadership on the innovation performance of the research team, the adjustment effect test of the leadership-member exchange relationship differentiation and the mediation effect test of the team social network show that, except for the hypothesis that H2b and H4a, other assumptions are obtained. The modified structural equation model path coefficient table is shown in the following table.
Table 2. Modified Structural Equation Model Path Coefficient.

<table>
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<tr>
<th>Regression path</th>
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Conclusions and Recommendations

Based on the dual leadership theory and social network theory, this paper studies the influence mechanism of dual leadership and team social networks on the innovation performance of university research teams. The empirical analysis has the following main conclusions: (1) The dual leadership and its two dimensions are significantly positively correlated with the innovation performance of university research teams. Handling the relationship between imperative leadership and empowered leadership by leaders can promote the improvement of team members’ innovation performance. (2) The internal social network of the team does not play an intermediary role in the imperative leadership and the innovation performance of the university research team. (3) The external social network of the team plays a partial intermediary role between the dual leadership and its sub-dimensions and the innovation performance of the university research team. Through the acquisition of external resources, team members can continuously learn and grow, thus promoting the realization of innovation performance. (4) Leadership-member exchange relationship differentiation plays a negative role in regulating the innovation performance of dual-level leaders and university research teams. A higher degree of leadership-member exchange relationship differentiation will lead to the formation of awareness within the circle, which is not conducive to the improvement of team members' innovation performance.

The conclusion of this paper has the following theoretical significance for the research on the innovation performance of university research teams: the social network theory is used as a mediator variable to enrich the research of social network theory; the differentiation of leadership-exchange relationship as a regulatory variable into the theoretical structure of dual leadership and innovation performance, which increased research on the theme of leadership styles and innovative performance. At the same time, the conclusion of this study has practical significance for the innovation of university research teams: Firstly, in the process of scientific research and innovation, leaders need to adopt a balanced dual-lead leadership model. Leaders must not only standardize the innovation system, but also create an atmosphere of freedom and innovation, and cultivate the autonomy of the innovation subject to lead high team innovation activities. Awareness to lead high team innovation activities. Secondly, the team social network should be established and improved, the quality of social network nodes should be improved, and efficient and high quality innovation platform should be established.

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References


