

# How Informal Networks Impacts Ambidextrous Innovation via Absorptive Capacity

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**Abstract:** This research empirically investigates the impact of informal networks on ambidextrous innovation (i.e., exploratory innovation and exploitative innovation) and the mediating role of absorptive capacity using 598 manufacturing companies as a sample. The results show that informal networks has a significant positive on ambidextrous innovation. Furthermore, we find that these relationships are mediated by absorptive capacity. These findings enrich the studies on ambidextrous innovation and have significant managerial implications for company managers.

**Keywords:** Informal networks, Ambidextrous innovation, Absorptive capacity.

## 1. Introduction

A key barrier to the modernization and advancement of Chinese companies as well as the development of global competitiveness is the absence of independent innovation potential [1]. As a result, it is not a good idea for Chinese enterprises to focus solely on imitation or independent innovation [2]. What they need is ambidexterity innovation ability. Ambidextrous innovation is the combination and coexistence of two conflicting types of activities. On the one hand, the first is applying current resources and knowledge to carry out incremental innovation activities with only a small amount of risk. On the other hand, the second is the risky, breakthrough innovation activities that investigate new knowledge and resources [3–5].

Prior research has shown that informal networks play a vital role in innovation [6, 7]. For example, to improve both organizational performance and individual performance, organization members will use informal networks to seek out or offer information and advice to others [8–10]. However, scholars are currently primarily concerned with the relationship between formal networks and ambidextrous innovation, with little research on the relationship between informal networks and ambidextrous innovation. Therefore, this research attempts to explore the influence of informal networks on ambidextrous innovation.

According to previous research, absorptive capacity reflects a company's ability to respond to knowledge, and it is a transformation tool between knowledge and innovation [11, 12]. Absorptive capacity is an important factor affecting knowledge acquisition and organizational innovation [13]. In addition, informal networks is an important channel for the circulation of organizational resources and information [14]. Based on these arguments, this research proposes that absorptive capacity may enable firms to acquire explicit and tacit knowledge needed for ambidextrous innovation from informal networks, that is, the association between ambidextrous innovation and informal networks is mediated by absorptive capability.

In summary, this research constructs a theoretical research model from three aspects: informal networks, absorptive capacity, and ambidextrous innovation. First, we explore the mechanism of informal networks on ambidextrous innovation.

Second, by examining the role that absorptive capacity plays as a mediator in the connection between informal networks and ambidextrous innovation, we dig into the inner "black box" mechanism. Third, based on the empirical research results, this research puts forward the path strategy to promote companies' ambidextrous innovation, which provides practical enlightenment for companies' informal networks governance and the improvement of absorptive capacity.

## 2. Theoretical Development and Hypotheses

### 2.1. Informal Networks and Ambidextrous Innovation

An informal network is a group created by colleagues in formal organizations who have complimentary skills because they share the same interests, hobbies, or feelings [15]. Its function is to share information and talk about feelings [16]. All aspects of business activity will be affected by informal network learning and communication from a humanistic perspective [17]. Members of informal networks can engage and communicate informally to transfer tacit knowledge and spur creativity [18]. Additionally, informal networks, which are frequently linked to proximity in geography, might facilitate collaborative innovation synergies and speed up learning [19]. According to some studies, using informal networks to provide high-level assistance helps to cultivate tacit cooperation among employees, increase the ability to identify issues, improve cooperation ability, and thus lower the cost of innovation [20, 21]. This study argues that informal networks of informal communication channels to promote organizational knowledge, particularly innovation activities, have a substantial influence on the streams of tacit knowledge, sharing, absorption, integration, and accumulation, and ambidextrous innovation for enterprise development reserve knowledge of technology innovation resources [22], and assist enterprise progressive innovation and breakthrough campaigns [23]. Therefore, we proposed:

H1: Informal networks has a positive effect on ambidextrous innovation (H1a: exploratory innovation; H1b: exploitative innovation).

## 2.2. Mediating Role of Absorptive Capacity

The requirement and assurance for a company to find, consume, and integrate outside knowledge is absorptive capacity [24]. Strong absorptive capacity means that a company can adapt to the changing innovation environment and technology faster, improve internal and external resource utilization and competitive advantage [25, 26]. The two different forms of absorptive capacity are external and internal absorptive capacity. [25]. External absorptive capacity includes confirmation and acquisition of external knowledge, whereas internal absorptive capacity includes integrating, transforming, and applying new knowledge [25]. Through informal channels, informal networks enable employees and organizations to communicate tacit information and accumulate it [20], laying the groundwork for knowledge acquisition and the development of an organization's absorptive capacity [24]. In other words, an unofficial network can enhance absorptive ability. Additionally, an increase in absorptive capacity enhances the impact of organizational information sharing [22], which facilitates the adoption of company ambidextrous innovation. Therefore, we argued:

H2: The relationship between informal networks and ambidextrous innovation is mediated by absorptive capacity (H2a: exploratory innovation; H2b: exploitative innovation).

## 3. Method

### 3.1. Data Collection

The data of this research mainly comes from the questionnaire, which is conducted on the manufacturing companies in the Yangtze River Delta region. The questionnaire is distributed by the combination of on-site and online distribution, and the content of the on-site questionnaire is consistent with that of the online questionnaire. Three techniques of data collection were used to assure the validity and completeness of the questionnaire. First, for local and surrounding enterprises in Shanghai, field research was used to collect data. Second, a questionnaire survey was conducted on alumni who held management or R&D positions in related enterprises. Third, use the questionnaire research platform to gather data. 900 questionnaires were distributed using the three techniques mentioned above; 671 of them were recovered, 73 of them were rejected, and 598 of them were valid, yielding an effective recovery rate of 66.44%.

### 3.2. Measures

Adapted from Zhou and Li [27] and Atuahene-Gima [28],

exploratory innovation and exploitative innovation were measured with 4 items, respectively. Adapted from McEvily et al. [29] and Aalbers et al. [30], informal networks were measured using six items in two dimensions: network density and network centrality. Adapted from Zahra et al. [31] and Limaj and Bernroider [32], absorptive capacity was measured with 8 items in two dimensions: external and internal absorptive capacity. All variables were evaluated on a seven-point Likert scale, with 1 denoting total disagreement and 7 denoting total agreement, except for the control variables (company age and size).

### 3.3. Scale Validity and Reliability

Factor analysis was done on the variables such as informal networks, absorptive capacity, exploratory and exploitative innovation in order to test the validity and reliability of the questionnaire. In accordance with the findings, each variable's KMO value fell within the range of 0.715 and 0.829, which was larger than or almost equal to 0.700. The Bartlett sphere test result differed considerably from 0, which satisfied the requirement for factor analysis. The variables' Cronbach's coefficients ranged from 0.652 to 0.887, and the combined reliability (CR) value ranged from 0.817 to 0.931, all of which exceeded the threshold value of 0.700, demonstrating the scale's high reliability level. Each item's factor loadings fell within the range of 0.620 to 0.921, exceeding the criterion of 0.500, demonstrating the study scale's strong convergent validity. The threshold value of 0.500 was exceeded by the mean extraction variation (AVE), which demonstrated the clear discriminative validity of each study scale. The AVE values varied from 0.542 to 0.818.

## 4. Analyses and Results

### 4.1. Descriptive Statistics and Correlation Analysis

Table 1 shows the descriptive statistical indicators of the variables, including the mean, standard deviation, and correlation coefficient among variables. The findings indicate that absorptive capacity is strongly positively connected with exploratory innovation, exploitative innovation, and informal networks, and that exploratory innovation and exploitative innovation are significantly positively correlated with absorptive capacity. These results provide a premise for analyzing the mediating effect of informal networks' effectiveness and absorptive capacity. H1a, H1b and H2a, H2b have been preliminarily verified.

**Table 1.** Descriptive statistics and correlations matrix

Variables	Means	S.D.	1	2	3	4	5	6
1. Company age	3.287	1.182	1					
2. Company size	2.741	0.902	0.459***	1				
3. Informal networks	4.006	1.095	0.325***	0.280***	1			
4. Absorptive capacity	5.351	1.045	0.143***	0.125**	0.621***	1		
5. Exploratory innovation	4.804	1.109	0.170***	0.236***	0.559***	0.559***	1	
6. Exploitative innovation	5.352	1.055	0.187***	0.155***	0.647***	0.556***	0.624***	1

Note. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

### 4.2. Main Effect Testing

In Table 2, Models 1 and 3 evaluate the impact of control

variables on the dependent variable, whereas Models 2 and 4 incorporate independent variables to test the main impact of informal networks on ambidextrous innovation. Model 2 in

Table 2 shows that the informal networks ( $\beta = 0.263, p < 0.01$ ) has positive effect on exploratory innovation, thus supporting H1a. Model 4 in Table 2 shows that informal networks ( $\beta =$

$0.306, p < 0.01$ ) has positive effect on exploitative innovation, thus supporting H1b.

**Table 2.** Results of main effect

Variables	Exploratory innovation		Exploitative innovation	
	Model 1	Model 2	Model 3	Model 4
Constant	17.262***	7.080***	19.889***	8.040***
Company age	0.069	-0.051	0.127**	-0.014
Company size	0.002***	0.001**	0.001	-0.002
Informal networks		0.263***		0.306***
R <sup>2</sup>	0.060	0.322	0.041	0.420
Adjusted R <sup>2</sup>	0.055	0.315	0.035	0.414

Note. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

### 4.3. Mediating Effect of Testing

The Baron and Kenny (23) “three-step mediation regression analysis” method was employed in this study to investigate the mediation hypothesis. First, the ambidextrous innovation was regressed using informal networks. Second, the absorptive capacity was regressed using informal networks. Third, the ambidextrous innovation was regressed using informal networks and absorptive capacity. Among them, both the first step and the second step require significant regression coefficients. In the third step, if the regression coefficient of absorptive capacity is significant, while the independent variable informal networks is not, it implies that absorptive ability fully mediates the situation. If the regression coefficients of informal networks and absorptive capacity are both significant, but the regression coefficient of informal networks is weakened, it indicates that

absorptive capacity plays a partial mediating role. Since H1a and H1b have been supported to make the first step valid, this part directly conducts the test of the second and third steps. In the second step, Model 5 in Table 3 shows that the informal networks ( $\beta = 0.326, p < 0.01$ ) have a significant impact on absorptive capacity is significant. In the third step, Model 2 in Table 3 show that informal networks ( $\beta = 0.089, p < 0.01$ ) and absorptive capacity ( $\beta = 0.267, p < 0.01$ ) have significant positive effects on exploratory innovation. Furthermore, Model 4 in Table 3 show that informal networks ( $\beta = 0.083, p < 0.01$ ) and absorptive capacity ( $\beta = 0.609, p < 0.01$ ) have significant positive effect on exploitative innovation. In summary, the results of the three-step regression analysis discussed above show that informal networks, exploratory innovation, and exploitative innovation are all influenced by absorptive capacity to some extent, and H2a, H2b are supported.

**Table 3.** Results of mediating effect

Variables	Exploratory innovation		Exploitative innovation		Absorptive capacity
	Model 1	Model 2	Model 3	Model 4	Model 5
Constant	7.080***	2.668**	8.040***	3.240***	6.682***
Company age	-0.051	-0.035	-0.014	-0.002	-0.013
Company size	0.001**	0.001**	-0.002	-0.002	-0.002
Informal networks	0.263***	0.089***	0.306***	0.083***	0.326***
Absorptive capacity		0.267***		0.609***	
R <sup>2</sup>	0.322	0.420	0.420	0.586	0.553
Adjusted R <sup>2</sup>	0.315	0.411	0.414	0.579	0.549

Note. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

## 5. Conclusion

### 5.1. Empirical Findings

In order to investigate the influence mechanism of informal networks on ambidextrous innovation, theories relating to absorptive capacity and informal networks were merged in this study. The proposed research hypotheses were put to the test using multiple regression analysis, and the findings indicated that they were supported. The findings indicate that informal networks have a considerable beneficial effect on ambidextrous innovation, i.e., they can increase the degree of exploratory and exploitative innovation, which is an essential antecedent variable of ambidextrous innovation. The

relationship between informal networks, exploratory innovation, and exploitative innovation can be partially mediated by absorptive capacity. The mediating impact demonstrates that the company’s ability to absorb new ideas is necessary for the informal networks to play their full role in ambidextrous innovation.

### 5.2. Managerial Implications

This research, based on the previous related literature and the related theories (informal networks theory, the ambidextrous innovation theory, and the absorptive capacity theory), the informal networks (independent variables), ambidextrous innovation (dependent variable), and the

relations between and among absorptive capacity (mediating variable), has carried on the theoretical analysis and empirical research, deepening and expanding the antecedents and mediation mechanism of ambidextrous innovation. Some enlightenment has been obtained for the practice of ambidextrous innovation management.

First, company managers should pay attention to informal networks within their companies. Specifically, company managers should understand what informal networks exist in the company, and who are the core people in those networks, and then mobilize them to serve the company's goal. Furthermore, company managers should establish effective incentive mechanisms and create an innovative cultural atmosphere to encourage informal network members to transfer their knowledge.

Second, company managers need to strengthen their absorption capacity construction. Specifically, company managers should increase the investment in internal technology platform and information construction to improve their information processing ability. Furthermore, company managers should actively guide employees to actively participate in product innovation activities.

### 5.3. Limitations and Future Research

Our research has some limitations. First, the study's sample was limited to manufacturing companies in the Yangtze River Delta, resulting in regional limitations, and it is still necessary to confirm the conclusions of the research's generalizability. Second, this research only examined the mediating effect of absorptive capacity, and other mediating and moderating variables could be further investigated in the future. Third, in this research, informal networks is considered as a whole. In the future, the influence of specific dimensions of informal networks on ambidextrous innovation can be further investigated.

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