# The Influence of Supportive Organizational Climate on Employees' Innovation Behavior: The Mediating Role of Team Engagement and Work Engagement

LIPING SONG, SUREERUT INMOR, NACHAYAPAT CUIJTEN*
Faculty of Business Administration,
Rajamangala University of Technology Thanyaburi, Pathum Thani,
THAILAND
*Corresponding Author*

*Abstract:* - This study aims to explore, in the Chinese software and information technology services industry, whether a supportive organizational climate will directly affect employees' innovation behavior and indirectly affect it through employees' team engagement and work engagement. So, this study used quantitative research methods, collected 613 questionnaires in six provinces and cities in China, and analyzed data using SPSS26.0 and AMOS23.0. Finally, the result shows that a supportive organizational climate has a direct positive influence on employees' innovation behavior, and has a positive indirect influence on employees' innovation behavior through team engagement and work engagement, and the mediating effect is more than a direct effect. This article not only further reinforces the foundations of social cognitive theory and self-determination theory, but also fills the research gap on employees' innovation behavior in the Chinese software and information technology service industry: provides leaders with support on how to create a supportive organizational climate to promote employees' innovation behavior, and assists employees in understanding how to stimulate their innovation behavior.

*Key-Words:* - Supportive organizational climate, Employees' innovation behavior, Team engagement, Work engagement, Organizational hierarchy, Interpersonal relationship and communication, Emotional, Vigor, Absorption.

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## 1 Introduction

The Chinese government has been formulating plans and strategies for the development of computer technology since the founding of the People's Republic of China in 1949. However, due to economic and technological constraints, the progress of computer technology was relatively slow. Following the Reform and opening in 1978, the Chinese software industry began to emerge as an independent sector and gradually became the foundation for the development of various industries. To promote national economic growth, the Chinese government took multiple measures to support the development of the software and information technology sectors, such as technical training for employees, financial support, and policy incentives. By the late 19th century and early 20th century, the Chinese software and information technology services industry experienced unprecedented growth and progress. Particularly with the outbreak of the COVID-19 pandemic in 2019 and the technology suppression from outside, the software and information technology industry not only survived but also thrived, showing resilience and vitality. According to the data from National Bureau of Statistics of China and Ministry of Industry and Information Technology of the People's Republic of China, by 2023, there were more than 38,000 large-scale enterprises in the Chinese software and information technology services industry. The industry's main economic revenue grew from 1.8849 trillion yuan in 2011 to 9.5502 trillion yuan in 2021, by the end of 2023, the main economic revenue reached 12.3258 trillion yuan, and by the July 2024, it reached 7.3429 trillion yuan, an increase of 11.2% year-on-year. The number of employees in the industry increased from 2.218 million in 2011 to 5.192 million in 2021, representing a growth rate of 143.98%, the highest among 19 Chinese industries in terms of employee growth. By the end of 2022, the number of employees reached 5.292 million, with the majority concentrated in Beijing, Guangdong, Shanghai, Jiangsu, Zhejiang, and Sichuan.

Although Chinese software and information technology development has made significant progress. Such as: major breakthroughs have been made in key technological fields: chip technology for

electronic products, satellite navigation in aerospace, and network communication technology. However, it still faces numerous challenges. For example, in some areas, critical technologies that are essential remain unresolved, constrained by external limitations; the diverse needs of the public for lifestyle, work efficiency, and information security have also raised higher demands on industry technologies, and so on. These challenges require companies to adjust their development strategies in a timely manner and enhance their competitiveness to adapt to market changes. However, for businesses, all technological competition ultimately boils down to the competition for talent, and the competition for talent depends on the competition for innovation behavior. [1], pointed out that organizational innovation ultimately stems from the internal innovation of employees within the organization. Employees' individual innovation behavior constitutes a micro-foundation [2] of organizational innovation and entrepreneurship [3]. Therefore, leaders of the software and information technology service companies are continuously taking measures to encourage employees' innovative behavior in order to stay competitive in the fierce market.

This development has similarly attracted the attention of scholars. [4], listed 162 Chinese companies in the information transmission, software, and information technology services sector, and analyzed an evaluation system for the continuous operational capability of the industry. This system includes assessments of profitability, operational capability, solvency, development capability, and cash flow capability. [5], explored the moderating effect of checks and oversight mechanisms on the level of strategic aggressiveness in the Chinese software and information technology services companies, and so on. Domestic and international scholars have not only researched the development and innovation of the software and information technology services industry, but also explored factors influencing employees' innovation behavior in this industry: individual characteristics [6], team engagement [7], organizational climate [8], and so on. These factors can all have an impact on employees' innovation behavior.

Therefore, this study focuses on professionals in the Chinese software and information technology service industry, considering employees' team engagement and employees' work engagement as mediating variables, to analyze the influence of supportive organizational climate on employees' innovation behavior, and aims to explore in the software and information technology services industry, whether supportive organizational climate directly influences employees' innovation behavior, and does it have an indirect influence on employees' innovation behavior through employees' team engagement and work engagement. And then, this study hopes to provide leaders with theoretical support that how the leaders should create a supportive organizational climate to promote employees' innovative behavior and organizational development, and also hopes to provide assistance to employees in understanding how to stimulate their own innovation behavior.

# 2 Theoretical Foundation and Hypotheses

## 2.1 The Theoretical Foundation

American psychologist [9] proposed the Social Cognitive Theory based on the traditional behavioral personality theories, He believed that when individuals make judgments and decisions, their behavior will be influenced by others' behavior within the organization and the environment. In line with the theory, this study hypothesizes that employees' behavior is affected by the organizational climate directly.

In 1985, [10] pointed Self-Determination Theory, and then he posited that when the external environment satisfies an individual's competence and relationship needs, while also providing autonomy support, individuals begin to internalize external values and regulations, leading to self-integration into the work and promoting their behavior towards positive and healthy directions, [11]. Therefore, in accordance with the theoretical foundation, this study hypothesizes that organizational climate affects employees' team engagement and work engagement, which in turn affects employees' behavior.

## 2.2 The Definition and Dimension of Variables

### 2.2.1 The Definition and Dimension of Organizational Climate

The term "organizational climate" originated from the concept of "cognitive map" in 1926. Subsequently, scholars began to explore its definition. [12], believed that organizational climate refers to employees' perception of organizational events and environment, and this perception is subject to change. [13], believed that organizational climate refers to employees' perceptions of various aspects of organizational climate and the perceptions of common daily practices within the organization. It is difficult to

assert that all types of organizational climates are suitable for all industries, and not every aspect of the organizational climate has a uniformly positive impact. So, we should analyze which dimensions of organizational climate have a positive impact. [14], summarized the dimensions of organizational climate: organizational hierarchy, interpersonal relationships and support for members, and so on. [15], utilized five dimensions to understand the influence of organizational climate on employees' engagement. They are leadership, employee interpersonal relationships, employee commitment, employee satisfaction, and employee work motivation. This study adopted organizational hierarchy, international leadership and communication.

#### 2.2.2 The Definition and Dimension of Team Engagement

Although the term engagement has been around for many years, there is not many researches on it by scholars both domestically and internationally. Currently, [16] suggested that team engagement refers to members' attachment to the team, as well as the collaboration and interaction among members. There are also some scholars who define team engagement as organizational engagement. For example, [17] pointed out that organizational engagement is an expression of members' physical, cognitive, and emotional engagement with the organization. Although the scholars used the words: organizational engagement, from the definitions and content perspective, organizational engagement and team engagement are essentially similar, and their dimensional divisions for the two concepts are also consistent. Therefore, this study argues that organizational engagement and team engagement are the same. [18], divided team engagement into the integration of behavioral and emotional. [19], divided team engagement into positive cognitive, emotional, and behavioral. On the basis of extensive research by numerous scholars, this study argues that team engagement should start with emotional reliance on the team, which in turn leads to behavioral engagement in team decision-making and execution.

#### 2.2.3 The Definition and Dimension of Work Engagement

The literature review revealed that work engagement originated in positive psychology. Therefore, scholars have analyzed work engagement from different psychological perspectives. In the 1990s, work engagement was defined that employees can express themselves freely and devote themselves to their work, and the two can be effectively combined. [20], believed that work engagement refers to the level of enthusiasm, satisfaction, time, and energy invested by individual in the work process. [21], believed that work engagement refers to the ability to invest one's energy into work and maintain a sustained state. [22] and [23] classified work engagement as vigor, dedication, and absorption. This study supports that work engagement is considered to be the process by which employees devote their concentration and energy to their work, therefore, work engagement is classified as vigor and absorption.

#### 2.2.4 The Definition and Dimension of Employees' Innovation Behavior

[24], believed that employees' new ideas and solutions influenced organizational innovation outcomes. [25], believed that employees' innovation behavior refers to the process of employees' work, the ideas they generate and possess and the result of concertizing such ideas into practical behaviors. [26], believe that innovation behavior includes the generating of new ideas, and technologies, and the experimentation of related new ideas. Research findings showed that both domestic and international scholars generally divided employees' innovation behavior into generating innovative ideas and the act of executing innovation ideas. Therefore, this study adopts this dimension division.

### 2.3 Conceptual Framework and Hypothesis

#### 2.3.1 The Influence of Supportive Organizational Climate on Employees' Innovation Behavior

Scholars have not only studied the definition and dimensions of supportive organizational climate and employees' innovation behavior but also explored whether supportive organizational climate would influence employees' innovation behavior. [27], showed that a supportive organizational climate nurtures employees' innovation. [28], believed that organizational climate influences employees' understanding of the organization and their own actions. [29], believed that colleagues' expectations and leadership support positively influenced employees' innovation behavior, as they represent the organization's level of support and recognition for their innovation efforts. [30], pointed out that a supportive organizational climate has an influence on employees' innovation. So, this study set the following hypothesis:

**H1:** Supportive organizational climate has an influence on employees' innovation behavior.

### 2.3.2 The Mediating Role of Team Engagement

This study found that organizational engagement and team engagement are consistent in definition and content. Therefore, organizational engagement will also be investigated concurrently with team engagement. [31], suggested that a supportive organizational climate can foster the flourishing development of team engagement. [32], pointed out that a supportive innovation climate can really increase employees' team engagement. [33], concluded that organizational climate will affect organizational engagement with statistical significance. [34], pointed out that when all team members can actively engage in the planning, organization, and decision-making processes of the team, they are more likely to share their creativity and address problems in a positive manner. [35], supposed that, when problems arise at work, highly organizationally engaged employees are more willing to actively and enthusiastically explore new ideas and methods for the benefit of the organization or team to solve these problems. They will use available resources to turn these ideas and methods into reality to resolve the crisis facing the organization or team. So, this study set the following hypothesis:

**H2:** Supportive organizational climate has an indirect influence on employees' innovation behavior through employees' team engagement.

### 2.3.3 The Mediating Role of Work Engagement

[36], found that learning opportunities that employees get from the companies, colleagues' help, and leaders' support directly affect employees' work engagement. [37], concluded that colleagues' cooperation and help had positively relationship with work engagement, and the support from companies and leaders' is also an important factor. This suggests that organizational climate affects employees' work engagement. [38], found that if employees can focus and devote themselves to solving problems in their workplaces, it will help them to generate creativity, and these focus and breakthroughs will stimulate more ideas and execute more innovation behaviors. [39], believed that employees, who invest enough or even extra energy, devote themselves to their passions, and pay constant attention to the progress of their work, will tend to adopt more innovation behaviors. [40], showed that the higher the level of employees' work commitment, the more they tend to look for various ways to realize new ideas, and thus the more creativity they show in their work. So, this study set the following hypothesis:

**H3:** Supportive organizational climate has an indirect influence on employees' innovation behavior through employees' work engagement.

Based on the theoretical foundation and hypothesis, this study set the conceptual framework as shown in Figure 1.

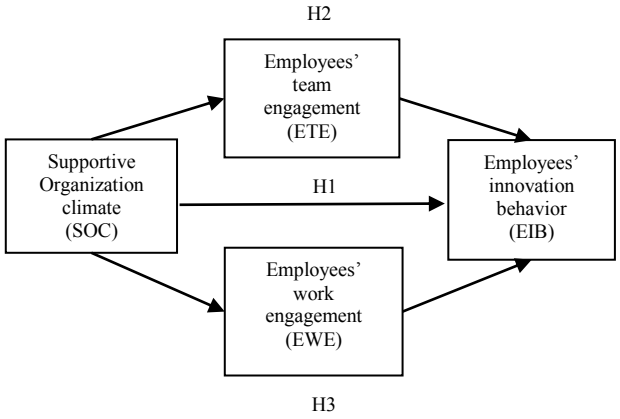


Fig. 1: Conceptual framework

## 3 Research Methodology

The object of this study is to analyze employees' innovation behavior in the Chinese software and information technology services industry. Therefore, employees in this industry are the subjects. According to the data from ministry of industry and information technology of the People's Republic of China, the number of employees in this industry has reached 5.292 million people in 2022. And they are more concentrated in places of Beijing, Guangdong, Shanghai, Jiangsu, Zhejiang, and Sichuan province, accounting for 65.5% of the total national workforce in this industry. Therefore, this survey primarily focused on employees in these six regions. In order to make the collected samples more representative, this research calculated the sample size for each region based on the proportion of employees in each place among the employees in the six regions. Within each selected region, no more than 10 employees were chosen from each software and information technology service company as survey subjects. According to the viewpoint of [41], the sample size should be greater than 500 using the structural equation model. Therefore, this study also required a sample size greater than 500.

This study utilized a survey questionnaire as a tool for quantitative analysis. Firstly, the study formulated 3 measurement items for each observed variable, a total of 24 measurement items, along with 5 personal information items. These measurement items were adapted from maturity scales used by scholars and employed a Likert five-point scale to set

the options for the questions, from strongly disagree to strongly agree.

After setting up the questionnaire, the researcher invited 3 experts to evaluate its Item-objective congruence(IOC). After receiving expert approval and making necessary revisions, the researcher collected a total of 613 valid responses. And then, this study analyzed the data by SPSS26.0 and AMOS23.0.

# 4 Results

Before analyzing the hypothesis, this study tests the model, including reliability and validity analyses, and the goodness of fit test.

## 4.1 Demographic Data

Out of 613 valid questionnaires, 51% are male, slightly more than women; the age of practitioners is generally between 18 and 40 years old, accounting for a combined 87%, this reflects the predominantly youthful nature of the industry; practitioners generally have worked for less than 10 years in their current positions, this also helps to explain why the industry is dominated by young people; the number of interviewees of each region is in line with the predetermined number of interviewees (as shown in Table 1, Appendix).

## 4.2 Reliability Analysis

According to [42], Cronbach's alpha is bused to test items' reliability, and Cronbach's alpha should be greater than 0.700 when the study adopts the maturity scale, 0.500 is the lowest acceptable reliability level when the study develops the scale autonomously. From Table 2 (Appendix), it can be seen that the Cronbach's alpha for the 24 items in this study is from 0.805 to 0.849. All these values are greater than 0.700, which means the items of the questionnaire have high reliability (as shown in Table 2 in Appendix).

## 4.3 Validity Analysis

In this study, the measurement scale was modified from established scales previously used by other scholars. Therefore, this study employed confirmatory factor analysis (CFA) for convergent validity and discriminant validity measurement. According to [43], it is essential to test the fit of model before measuring hypothesis: $X2 = 260.663$, $Df = 224$, $X2/df = 1.164 < 5$, $GFI = 0.966 > 0.95$, $AGFI = 0.955 > 0.95$, $CFI = 0.994 > 0.95$, $TLI = 0.993 > 0.95$, $IFI = 0.994 > 0.95$, $RMR = 0.036 > 0$, $RMSEA = 0.016 < 0.6$. From these values, it can be seen that the fitting indices meet the requirements, indicating that a good fit.

[44] pointed, in the test of convergent validity, the acceptable level of constructive validity (CR) is above 0.700, Average Variance Extracted (AVE) is above 0.500. In Table 3 (Appendix), it can be seen CR for the observed variables are from 0.806 to 0.849, all above 0.700; AVE is from 0.581 to 0.652, all above 0.500. This indicates that the four observed variables have good convergence. (as shown in Table 3 in Appendix).

In discriminant validity measurement, [45] suggested that the square root of the AVE should be greater than the correlation coefficients between the respective pairs of variables. Table 4 (Appendix) instigated each observed variable's square root of AVE is greater than the correlation between observed variables. This indicates that there is a certain distinction among the observed variables of the four variables (as shown in Table 4 in Appendix).

## 4.4 Hypothesis Analysis

To measure the hypotheses, this study utilized AMOS23.0 to conduct measurements on the structural equation model. According to [46] and [47], when testing the mediating effect, the bias-corrected bootstrap method can be used, and this process is repeated 5,000 times, the confidence interval estimate is 95%. Based on the recommendations of two scholars, this study analyzed the data and got the path coefficient as shown in Figure 2 and Table 5 in Appendix.

Figure 2 (Appendix) shows that in the relationships among the four variables, the standardized coefficient of supportive organizational climate on employees' team engagement is 0.635, on employees' work engagement is 0.634, and on employees' innovation behavior is 0.280. These findings indicate that a supportive organizational climate has a significant positive influence on all three variables, with its effect on employees' team engagement and work engagement greater than its effect on employees' innovation behavior. The standardized coefficient of employees' team engagement on employees' innovation behavior is 0.265, and the standardized coefficient of employees' work engagement on innovation behavior is 0.314. This suggests that both employees' team engagement and work engagement will influence employees' innovation behavior, with their effects being relatively similar.

Table 5 (Appendix) shows that in the total effect of supportive organizational climate on employees' innovation behavior, the P-value is 0.000, less than 0.050, the confidence interval ranges from 0.500 to

0.961, without crossing 0, the non-standardized coefficient is 0.690, the standardized coefficient is 0.647. That means a supportive organizational climate positively influences employees' innovative behavior.

Among these, the direct effect of supportive organizational climate on employees' innovative behavior, P-value is 0.048, less than 0.050, the values of the confidence interval is from 0.003 to 0.719, without crossing 0, the non-standardized coefficient is 0.298, the standardized coefficient is 0.280. So, it can be concluded that a supportive organizational climate will influence employees' innovation behavior positively and directly, and when a supportive organizational climate increases by one standard deviation, employees' innovation behavior increases by 0.280 standard deviations. So, H1 is valid.

In the indirect effect of employees' team engagement, the P-value is 0.034, less than 0.050, the values of the confidence interval are from 0.017 to 0.327, without crossing 0, the non-standardized coefficient is 0.179, and the standardized coefficient is 0.168. This indicates that supportive organizational climate affects employees' innovation behavior through employees' team engagement indirectly and significantly, and when supportive organizational climate increases by one standard deviation, employees' innovation behavior increases by 0.168 standard deviations through employees' team engagement. So, H2 is valid.

In the indirect effect of employees' work engagement, the P-value is 0.010, less than 0.050, the values of the confidence interval are from 0.073 to 0.391, without crossing 0, the non-standardized coefficient is 0.212, and the standardized coefficient is 0.199. This indicates that supportive organizational climate affects employees' innovation behavior through employees' work engagement indirectly and significantly, and when supportive organizational climate increases by one standard deviation, employees' innovation behavior increases by 0.199 standard deviations through employees' work engagement. So, H3 is valid.

At the same time, the table also shows that the direct effect of a supportive organizational climate on employees' innovation behavior is 0.280, while the indirect effect through employees' team engagement and work engagement is 0.367. This shows that the indirect effect of a supportive organizational climate on employees' innovation behavior, mediated by team engagement and work engagement, is greater than its direct effect.

# 5 Conclusion and Discussion

## 5.1 Conclusion

The result of this study showed that: in the Chinese software and information technology services industry, if the organizational hierarchy of a company is set up in a scientific and reasonable way, work processes are clear and well-defined, colleagues encourage and support each other, and team collaboration and communication are smooth, employees will perceive their company as having a supportive organizational climate, which directly influences their innovation behavior. This positive perception of the organizational climate also makes employees more willing to engage in the organization or team, more dedicated to their work, and, in turn, further promotes their innovation behavior indirectly.

At the same time, this study presented another interesting finding: the mediating effect of employees' team engagement and work engagement outweighs the direct effect of a supportive organizational climate on employees' innovation behavior. This means that if an organization fosters a supportive climate, employees will first develop emotional and autonomous behaviors towards the organization, and feel more vigor in their work, be more inclined to find solutions when facing difficulties. As a result, this enhances their creative ideas and execution, ultimately promoting innovative behavior.

## 5.2 Discussion

The research results are consistent with the findings of scholars: the climate in which organizational members operate is crucial for encouraging innovative behavior among employees, [48]. Theoretically, the success or failure of employees' innovation depends on organizational climate. For example, a company's effective communication mechanisms and its support for innovation: providing sufficient resources such as funding and time, all contribute to fostering employees' innovation, [49]. This is consistent with the result of "interpersonal relationship and communication" and "leadership and support" influencing employees' innovation behavior. An innovative organizational climate encourages individuals to become creative thinkers and problem solvers, thereby fostering the generation of innovative ideas, processes, and products among employees [50], and such innovative ideas are often supported and even rewarded, [51].

Additionally, [52] believed that interpersonal interaction processes are positively correlated with employees' team engagement. [53], found that

pointed that the structure of the organization and team leadership affect employees' team engagement. This research result coincides with the findings of this study: when the organizational hierarchy is designed more reasonably and scientifically, and when communication and interaction among colleagues are more effective, employees are more likely to develop positive perceptions and emotions toward the organization, and are more likely to internalize organizational rules and values through autonomous behavior, leading to stronger team engagement. This is consistent with the findings of [54] who discovered organizational climate has a relationship with employees' team engagement.

At the same time, employees' organizational engagement is a core resource for promoting innovative behavior. To foster innovation within the organization, attention should be given to employees' organizational engagement, as it positively influences innovation. Employees' engagement and innovation reinforce each other—engaged employees may be more innovative, and innovative organizations also can inspire and attract employees, [55]. [56], indicated that effective communication among team members impacts employees' effective cognition of the team, which contributes to team innovation. [57], concluded that employees who emotionally identify strongly with the organization will be motivated to complete their tasks diligently, thereby improving their work performance. From this, it can be seen that employees' emotions toward the organization influence their behavior.

Meanwhile, employees' work engagement promotes their pro-activity, enhances their dedication, and makes them more positive and responsible, thereby fostering organizational innovation, [58]. Employees encounter unexpected difficulties in their work, and only through perseverance, time, and effort, can they overcome these difficulties and achieve innovative activities [59], leading to creative outcomes.

## 5.3 Research Contributions

This study, through data analysis, explores the effect of a supportive organizational climate, employees' team engagement, and work engagement on employees' innovation behavior in the Chinese software and information technology services industry. It fills a research gap regarding the innovation behavior of employees in this sector and provides a theoretical reference for scholars studying the behavior of workers in this industry. Additionally, it further solidifies the theoretical foundation of Social Cognitive Theory and Self-Determination Theory regarding the interrelationship between environment, individuals, and behavior. This study also provides an in-depth analysis of the definitions and dimensional classifications of employees' team engagement, organizational engagement, and work engagement. It concludes that employees' team engagement and organizational engagement are different expressions of the same concept, and it clarifies team engagement and work engagement are two different concepts. This offers valuable reference points for scholars researching employee team involvement and work engagement.

In terms of practical significance, this study confirms that a supportive organizational climate positively affects employees' innovation behavior. On one hand, the findings provide practical guidance for software and information technology service companies on how to create a supportive organizational climate: If a company's workflow and job responsibilities encourage innovative thinking, allow employees to make autonomous decisions within their scope of the authority without needing to seek approval from superiors, and establish clear organizational structures and development plans to improve efficiency, furthermore, employees can receive encouragement and support from colleagues and maintain harmonious relationships, they are more likely to perceive the company as having a supportive organizational climate. As a result, they will have a stronger sense of belonging and admiration for their organization, and become more engaged and focused on the company's growth, which in turn fosters their innovation behavior.

On the other hand, the study also provides guidance for employees' personal development. According to the findings, the effect of "generating innovation ideas" on employees' innovation behavior is more significant than "the act of executing innovation ideas". This means, that for employees, to develop innovative products or provide innovative services within a company, they must first approach problems from different perspectives and consider solving issues in new ways to generate innovative ideas and insights. Additionally, they should be willing to share and discuss their innovative ideas with colleagues. This process is more crucial in promoting employees' innovative behavior than preparing resources, making plans, or applying new processes and technologies.

## 5.4 Limitations and Future Research

Although the results of this study provide numerous references for researchers in terms of both theory and practice, there are still imperfections in the scope of

the sample and the literature review. In future research, scholars can broaden the scope of the study in terms of the selection of the research sample to make the sample more representative; meanwhile, the references in terms of employee team participation and employee work engagement as mediating variables should be studied and described in more depth.

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- Liping Song, formulate and volute overarching research goals and aims, design the methodology, collect, statistics, analysis data and interpret results, write - original draft..
- Sureerut inmor, and Nachayapat Cuijten, Manage and coordinate responsibility for the research activity planning and execution, guidance to complete thesis revisions, Check the final draft and submission process.

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The authors have no conflicts of interest to declare.

# APPENDIX

Table 1 Respondents' Individual Information

| Basic Information | Options | Frequency | Percentage |
|---|---|---|---|
| If working in this industry | yes | 613 | 100% |
| | no | 0 | 0 |
| Gender | male | 315 | 51% |
| | female | 298 | 49% |
| Age | 18-25 years old | 183 | 30% |
| | 26-33 years old | 224 | 36% |
| | 34-40 years old | 126 | 21% |
| | 41-50 years old | 62 | 10% |
| | 51-60 years old | 18 | 3% |
| Years of Employment in Current Company | Less than 1 year | 167 | 27% |
| | 1-2 years | 122 | 20% |
| | 3-5 years | 202 | 33% |
| | 6-10years | 79 | 13% |
| | More than 10 years | 43 | 7% |
| Location of the Company | Beijing | 181 | 30% |
| | Guangdong | 155 | 25% |
| | Shanghai | 89 | 15% |
| | Jiangsu | 70 | 11% |
| | Zhejiang | 67 | 11% |
| | Sichuan | 51 | 8% |

Table 2. Reliability Test results

| Latent variables | Observed variables | Number of Items | Cronbach's alpha |
|---|---|---|---|
| Supportive Organizational Climate(SOC) | Organizational hierarchy(OH) | 3 | 0.805 |
| | Interpersonal relationships and communication(IRC) | 3 | 0.821 |
| Employees' Team Engagement(ETE) | Emotional(EL) | 3 | 0.846 |
| | Autonomous behavior(BR) | 3 | 0.832 |
| Employees' work engagement(EWE) | Vigor(VR) | 3 | 0.834 |
| | Absorption(AN) | 3 | 0.829 |
| Employees' Innovation behavior(EIB) | Generating innovation ideas(GII) | 3 | 0.849 |
| | The act of executing innovation ideas(AEII) | 3 | 0.835 |

Table 3. The Convergent Validity Test Result

| Observed Variables | Items | Factor Loading | R2 | | AVE | CR |
|---|---|---|---|---|---|---|
| Organizational hierarchy(OH) | | OH1 | 0.759 | 0.576 | | |
| Organizational hierarchy(OH) | | OH2 | 0.794 | 0.630 | 0.581 | 0.806 |
| Organizational hierarchy(OH) | | OH3 | 0.732 | 0.536 | | |
| Interpersonal relationships and communication(IRC) | | IRC1 | 0.799 | 0.638 | | |
| Interpersonal relationships and communication(IRC) | | IRC2 | 0.771 | 0.594 | 0.620 | 0.830 |
| Interpersonal relationships and communication(IRC) | | IRC3 | 0.792 | 0.627 | | |
| Emotional(EL) | | EL1 | 0.799 | 0.638 | | |
| Emotional(EL) | | EL2 | 0.800 | 0.640 | 0.646 | 0.846 |
| Emotional(EL) | | EL3 | 0.813 | 0.661 | | |
| Autonomous behavior(BR) | | BR1 | 0.790 | 0.624 | | |
| Autonomous behavior(BR) | | BR2 | 0.803 | 0.645 | 0.623 | 0.832 |
| Autonomous behavior(BR) | | BR3 | 0.774 | 0.599 | | |
| Absorption(AN) | | AN1 | 0.772 | 0.596 | | |
| Absorption(AN) | | AN2 | 0.798 | 0.637 | 0.617 | 0.829 |
| Absorption(AN) | | AN3 | 0.787 | 0.619 | | |
| Vigor(VR) | | VR1 | 0.783 | 0.613 | | |
| Vigor(VR) | | VR2 | 0.792 | 0.627 | 0.627 | 0.835 |
| Vigor(VR) | | VR3 | 0.801 | 0.642 | | |
| Generating innovation ideas(GII) | | CII1 | 0.818 | 0.669 | | |
| Generating innovation ideas(GII) | | CII2 | 0.782 | 0.612 | 0.653 | 0.849 |
| Generating innovation ideas(GII) | | CII3 | 0.823 | 0.677 | | |
| The act of executing Innovation ideas(AEII) | | QEII1 | 0.773 | 0.598 | | |
| The act of executing Innovation ideas(AEII) | | QEII2 | 0.777 | 0.604 | 0.628 | 0.835 |
| The act of executing Innovation ideas(AEII) | | QEII3 | 0.827 | 0.684 | | |

Table 4. The Discriminant Validity Test Results

| | VR | AN | AEII | GII | BR | EL | IRC | OH |
|---|---|---|---|---|---|---|---|---|
| **VR** | **0.792** | | | | | | | |
| **AN** | 0.520 | **0.785** | | | | | | |
| **AEII** | 0.347 | 0.285 | **0.792** | | | | | |
| **GII** | 0.381 | 0.302 | 0.546 | **0.808** | | | | |
| **BR** | 0.344 | 0.247 | 0.323 | 0.370 | **0.789** | | | |
| **EL** | 0.346 | 0.321 | 0.320 | 0.319 | 0.580 | **0.804** | | |
| **IRC** | 0.287 | 0.240 | 0.295 | 0.273 | 0.307 | 0.268 | **0.778** | |
| **OH** | 0.292 | 0.297 | 0.364 | 0.330 | 0.298 | 0.309 | 0.531 | **0.762** |

***Note:*** *1. Bolded data are the root mean square of AVE for this observed variable*
*2. OH: Organizational hierarchy, IRC: Interpersonal relationships and communication, GII: Generating innovation ideas, AEII: The act of executing Innovation ideas, VR: Vigor, AN: Absorption, EL: Emotional, BR: Autonomous behavior.*

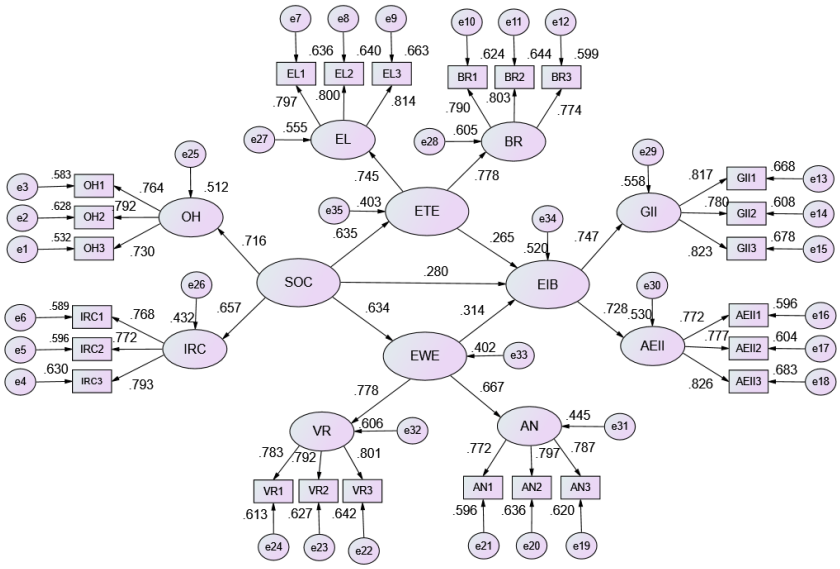


Fig. 2: Path Analysis

***Note:*** *SOC: Supportive Organizational Climate, OH: Organizational hierarchy, IRC: Interpersonal relationships and communication, EIB: Employees' innovation behavior, GII: Generating innovation ideas, AEII: The act of executing Innovation ideas, EWE: Employees' work Engagement, VR: Vigor, AN: Absorption, ETE: Employees' Team Engagement, EL: Emotional, BR: Autonomous behavior.*

Table 5. Results of the total effect

| Effect Types | Non-standardized Impact Values | | | | Standardized Values |
|---|---|---|---|---|---|
| | Estimate | Lower | Upper | P-value | |
| Total Effect | 0.690 | 0.500 | 0.961 | 0.000 | 0.647 |
| Direct Effect | 0.298 | 0.003 | 0.719 | 0.048 | 0.280 |
| Indirect Effect | 0.391 | 0.167 | 0.620 | 0.008 | 0.367 |
| SOC→ETE→EIB | 0.179 | 0.017 | 0.327 | 0.034 | 0.168 |
| SOC→EWE→EIB | 0.212 | 0.073 | 0.391 | 0.010 | 0.199 |

***Note:*** *SOC: Supportive Organizational Climate, EIB: Employees' innovation behavior, EWE: Employees' work Engagement, ETE: Employees' Team Engagement.*