

# The Impact of Empowering Leadership on Employee Improvisation: Roles of Challenge-Hindrance Stress and Psychological Availability

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**Purpose:** The purpose of this research is to explore the effect of empowering leadership on employee improvisation, including the mediating roles of challenge stress and hindrance stress as well as the moderating role of psychological availability.

**Methods:** Four proposed hypotheses were tested using hierarchical regression analysis and the bootstrapping method by reference to two waves of data collected in 2021 from 248 employees working for organizations located in southern China.

**Results:** The results showed that empowering leadership had a positive effect on employee improvisation, which was mediated by challenge stress and hindrance stress. That is, empowering leadership promoted challenge stress and decreased hindrance stress, thereby stimulating employee improvisation. Furthermore, psychological availability strengthened the positive effect of challenge stress on employee improvisation and weakened the negative effect of hindrance stress on employee improvisation. Psychological availability also moderated the indirect relationships among empowering leadership, challenge/hindrance stress and employee improvisation.

**Conclusion:** In theoretical terms, this study identifies a new antecedent of employee improvisation: empowering leadership. This study also advances knowledge concerning the mechanism by which empowering leadership exerts its influence by drawing on cognitive transactional theory. Moreover, this study's exploration of the moderating role of psychological availability enriches the literature concerning the boundary conditions of the challenge-hindrance stress model. In practical terms, this study provides useful insights that can help organizations activate employee improvisation and manage employees' work pressure.

**Keywords:** empowering leadership, employee improvisation, challenge stress, hindrance stress, psychological availability

## Introduction

Organizations face increasingly complex external environments and must often address various unstructured and unexpected situations.<sup>1</sup> Due to these highly dynamic and volatile external environments, employees' adoption of preset action strategies to deal with emergencies may lead to action failure and even cause the organization to miss out on opportunities for development.<sup>2</sup> To enhance organizational competitiveness and environmental adaptability, it is critical for HR managers and team leaders to cultivate employees' flexible thinking and ability to adapt to the situation so that the latter can engage in spontaneous and creative behaviors in unpredictable situations.<sup>3</sup> Employee improvisation represents one such an extemporaneous behavior, which is a mixture of spontaneity and creativity<sup>4</sup> and is defined as "the process of composing creative solutions to emergent issues within a short timeframe".<sup>1</sup> Increasing demands, which require employees to respond to emergencies quickly, highlight the importance of identifying the factors that drive employees to exhibit improvisation behavior.

Previous studies have explored the antecedents of employee improvisation, including both individual factors, such as mindfulness, resilience,<sup>2</sup> proactive attitude,<sup>1</sup> workplace spirituality, positive affect<sup>5</sup> and psychological capital,<sup>6</sup> and

situational factors, such as team cohesion,<sup>7</sup> team innovative climate,<sup>1</sup> procedural justice,<sup>4</sup> and knowledge management practices.<sup>8</sup> However, few studies other than Cunha et al (2003),<sup>9</sup> Liu et al (2022),<sup>5</sup> and Rego et al (2022),<sup>6</sup> have investigated the antecedents of employee improvisation from the perspective of leadership style. Considering the fact that the leader is the target of followers' imitation and learning behavior as well as a reference point for employees to make behavioral decisions in the workplace,<sup>10</sup> it is necessary to understand the impact of leadership on employee improvisation, particularly because organizations can manage this behavior by selecting and nurturing appropriate leaders.

Unlike previous research that has focused on servant leadership,<sup>9</sup> entrepreneurial leadership<sup>5</sup> and leader humility,<sup>6</sup> this study linked empowering leadership with employee improvisation to examine whether and how leadership that is characterized by the encouragement of self-management and opposition to the bondage of powerlessness affects employee improvisation. Empowering leadership, which refers to

leader behaviors directed at individuals or entire teams and consisting of delegating authority to employees, promoting their self-directed and autonomous decision making, coaching, sharing information, and asking for input,<sup>11</sup>

aims to increase employees' autonomy and their control over their work.<sup>12</sup> Hitherto, empirical studies have examined the influence of empowering leadership on creativity,<sup>13</sup> task performance,<sup>14</sup> and organizational citizenship behavior.<sup>15</sup> However, the impact of empowering leadership is complex and uncertain,<sup>12</sup> and the scholarly consensus that it is absolutely beneficial to employee performance may be premature.<sup>16</sup> This possibility suggests that researchers should explore the influence of empowering leadership on other criterion variables, for example, employee improvisation, to better reflect the behavioral processes that foster creativity.<sup>17</sup>

This study further explored the mechanisms linking empowering leadership with employee improvisation. Cognitive transactional theory claims that individuals first make challenging/threatening/obstructive stress appraisals of their current environment or contemporary events; second, these differential cognitive appraisals affect the coping behaviors exhibited by those individuals.<sup>18</sup> Cheong et al (2019),<sup>19</sup> in their review of research on empowering leadership, suggested that empowering leadership may stimulate employees to encounter a differentiated stress experience. In light of these arguments, we speculate that empowering leadership may affect employees' cognition of challenge stress and hindrance stress and that different categories of stress serve as mediating mechanisms with respect to the effect of empowering leadership on improvisation. Cavanaugh et al (2000)<sup>20</sup> divided work stress into challenge stress and hindrance stress according to their "good" or "bad" characteristics. Challenge stress refers to "eustress", with which an employee is able to successfully cope and which can contribute to the employee's personal growth and goal achievement; this category includes time pressure, workload, and job responsibility.<sup>21</sup> Hindrance stress refers to "distress", with which it is difficult for employees to deal and which may not be conducive to the realization of career goals; this type of stress includes role conflict, role ambiguity, and job insecurity.<sup>21</sup> Empowering leadership provides followers with authority and responsibility. Under these circumstances, followers may view empowering leadership as an opportunity rather than a hindrance to their growth and career achievement. That is, empowering leadership may increase employees' challenge stress and promote improvisation, and it may also decrease employees' hindrance stress and thus stimulate improvisation.

Based on cognitive transactional theory, when individuals make cognitive evaluations of stressors, their choice of coping strategies is partly determined by their resources (eg, physical health, control beliefs, and social support). Furthermore, the initiation of improvisation behavior is inseparable from the support provided by material, psychological and cognitive resources.<sup>22</sup> In light of these arguments, we proposed that the influence of challenge/hindrance stress on improvisation may be determined by the abundance of personal resources and the employee's ability to creatively integrate and utilize the available resources. Psychological availability, which refers to the "sense of having the physical, emotional, or psychological resources to personally engage at a particular moment",<sup>23</sup> represents a typical personal factor that can impact challenge/hindrance stress and result in timely coping behavior. This research draws on cognitive transactional theory to suggest that psychological availability moderates the effect of challenge/hindrance stress on employee improvisation and further moderates the indirect relationships between empowering leadership and employee improvisation via challenge stress and hindrance stress since psychological availability refers to employees' reservoir of coping resources.

In summary, this research makes the following theoretical contributions: (1) by examining the influence of empowering leadership on employee improvisation, this research expands the contextual antecedents of employee improvisation and enriches our understanding of the consequences of empowering leadership; (2) by exploring the mediating roles of challenge stress and hindrance stress, this research opens the black box of the relationship between empowering leadership and employee improvisation by introducing a new theoretical foundation, that is, cognitive transactional theory; and (3) by identifying the moderating role of psychological availability, this research improves our knowledge of the contingency factors that foster coping behavior, which has been overlooked by previous studies using cognitive transactional theory, and extends the literature concerning the boundary conditions of challenge stress and hindrance stress.

## Theoretical Background and Hypothesis Development

### Cognitive Transactional Theory

Cognitive transactional theory explains the mediating mechanism underlying the relationships between stressful environmental antecedents and individual emotions, subject well-being and physical health. This theory considers cognitive appraisal and coping to be two important process mechanisms.<sup>18</sup> First, cognitive appraisal, which includes both primary appraisal and secondary appraisal, depends on whether the external environment is related to individual well-being and, if so, in what ways it is thus related. Primary appraisal refers to an individual's judgment that the environment has beneficial or harmful effects on the individual's values, goals, self-esteem, health, etc. As an important supplement to this primary evaluation, secondary appraisal refers to the individual's assessment of the coping options that can effectively enable the individual to prevent losses or improve the individual's prospects for obtaining benefits.<sup>24</sup> There is no chronological order in which the primary and secondary appraisals must take place. The convergence of primary appraisal and secondary appraisal enables individuals to determine whether stressful external environments harm, threaten, or challenge their individual well-being. A harmful evaluation indicates that the individual has continuously experienced loss or restriction; a threatening appraisal refers to an injury or loss that has not yet occurred but can be anticipated; and a challenge appraisal focuses on the potential for gain or mastery.<sup>25</sup>

Second, the appraisal of harm, threat, or challenge determines the different coping modes that individuals adopt to regulate their short-term emotional responses.<sup>18</sup> Coping refers to an individual's efforts to continually change his or her cognition and behavior to address specific external/internal demands that are assessed as taxing or beyond the individual's current resources.<sup>24</sup> Individual coping activities are improvisational responses in the context of specific stressful situations and the individual's own resources. Coping strategies are not distinguished into good or bad strategies, and it is unclear whether any given strategy can achieve beneficial results in the future. Coping strategies are only the actions taken by individuals in the present to manage internal and external demands.<sup>18</sup> Individuals can choose from two types of coping strategies: problem-focused coping and emotion-focused coping. Problem-focused coping is used to change the stress caused by conflicting person-situation relationships, and emotion-focused coping is used to regulate stressful emotions.<sup>25</sup> Cognitive transactional theory not only proposes the mediating role of cognitive appraisal and coping in this context but also highlights the fact that the way in which individuals actually choose to cope depends on the resources that are available to them, such as the individual's physical resources (eg, health and energy), psychological resources (eg, positive beliefs), and competencies (eg, social skills).<sup>18</sup> Based on cognitive transaction theory, this study constructed the following moderated mediation model of the effect of empowering leadership on employee improvisation.

### Empowering Leadership and Employee Improvisation

Unlike authoritarian leadership with a vertical management style, empowering leadership clarifies the meaning of work to employees actively, gives them decision-making power and autonomy, and trusts employees' working ability.<sup>26</sup> This research posits that empowering leadership promotes employee improvisation. First, empowering leaders allow employees to make independent decisions concerning how to complete their work assignments, thus enhancing their sense of control over their work in a changeable environment and providing opportunities for employees to engage in

improvisation behavior and reducing their perception of risk and the impairment of their image.<sup>27</sup> Empowering leadership strengthens employees' cognitive flexibility and self-learning ability,<sup>28</sup> which enables them to plan and act quickly when they encounter opportunities. Therefore, employees are more willing to engage in tasks that lie outside their defined work roles, such as actively identifying new work procedures.<sup>29</sup> Second, by conveying information related to work meaning, communicating work progress and sharing resources with employees, empowering leaders can easily allow employees to realize their importance to the organization and enhance their sense of responsibility.<sup>30</sup> Empowering leadership also encourages employees to participate in decision-making to enhance their sense of self-worth. Under the influence of high levels of organizational responsibility and self-esteem, employees are highly motivated to engage in improvisation behavior. Third, empowering leaders believe in employees' ability to exhibit high performance and provide timely resource support, which improves the trust between leaders and employees<sup>27</sup> and enables employees to maintain a high level of psychological safety. Consequently, employee improvisation can be stimulated. Previous research has found that empowering leadership positively predicts employee innovation behavior,<sup>29</sup> taking charge,<sup>31</sup> and voice.<sup>32</sup> Based on the theoretical background and empirical research mentioned above, we propose the following hypothesis:

Hypothesis 1: Empowering leadership is positively related to employee improvisation.

## The Mediating Role of Challenge Stress

According to cognitive transactional theory,<sup>18</sup> job demands may be appraised as challenge stress if they are able to promote individual growth and career achievement. Empowering leadership attaches importance to the training of employees and implements a series of developmental investment measures to improve employees' work skills and performance. This research speculates that empowering leadership may increase employees' challenge stress. First, empowering leaders encourage employees to develop themselves and improve their work skills, and such leaders also propose challenging work requirements for employees in job design, which are reflected in increasing workload, task complexity and time urgency.<sup>33</sup> Empowering leaders provide employees with the power to work, emphasize the execution of responsibilities, and enlarge their work roles<sup>34</sup> so that employees face higher levels of challenge stress. Second, empowering leaders delegate work authority, which in turn enhances employees' flexibility in their daily work and stimulates their working potential.<sup>28</sup> Empowering leaders share information with employees and encourage them to participate in decision-making; accordingly, employees can accumulate psychological and cognitive resources, exert stronger control over their work,<sup>27</sup> and maintain a high level of absorption when responding to challenging work. Even when they encounter setbacks, they can maintain their confidence and resilience.<sup>35</sup> In summary, under the influence of empowering leadership, employees take on challenging tasks and improve their coping ability, which makes them more likely to view the work arrangements assigned by empowering leaders as a form of challenge stress that is conducive to personal growth and career development.

When individuals perceive high levels of challenge stress, they may adopt problem-oriented coping strategies in response. This research posits that challenge stress promotes employee improvisation. First, challenge stress involves unexpected and novel work tasks that can activate employees' enthusiasm and interest with respect to overcoming difficulties.<sup>21</sup> Under conditions of challenge stress, employees who adopt conventional work styles may struggle to cope with job demands, thus motivating them to utilize innovative ways of thinking and seek alternative solutions through improvisation. In addition, employees are more likely to successfully manage challenge stress, leading to a high level of self-efficacy<sup>36</sup> and motivating employees to improvise. Moreover, resource gain is a key factor that can allow employees to initiate improvisation.<sup>4</sup> Although coping with challenge stress consumes individual resources, successfully overcoming challenge stress contributes to individuals' promotion opportunities, growth, and accumulation of resources.<sup>20</sup> The high instrumentality of challenge stress can strengthen employees' job involvement and lead to a resource value-added spiral, thus activating their improvisation. Empirical research has found that challenge stress promotes employees' innovation performance.<sup>37</sup>

Overall, empowering leaders encourage employees' self-development and skill learning, focus on their opinions in the decision-making process and authorize them to make independent decisions, which may increase their challenge stress. Furthermore, challenge stress has a high likelihood of leading to successful coping and is highly instrumental, prompting employees to initiate improvisation behaviors. Lin et al (2020)<sup>38</sup> found challenge stressors to play a positive mediating

role in the relationship between transformational leadership and thriving at work. We thus propose the following hypothesis:

Hypothesis 2a: Challenge stress significantly mediates the relationship between empowering leadership and employee improvisation.

## The Mediating Role of Hindrance Stress

Hindrance stress occurs when job demands limit individual growth and the achievement of career goals. In the decision-making process, empowering leaders attach importance to employees' opinions and grant them job autonomy, which may decrease employees' hindrance stress. First, empowering leadership encourages employees to participate in decision-making and share work-related information, which helps employees improve the clarity of their tasks and understand the expectations of the organization regarding their work roles,<sup>12</sup> thus reducing the hindrance stress caused by role ambiguity. Additionally, empowering leaders provide employees with autonomous work space, allow them to make decisions independently, and enable them to determine the sequence in which their work is completed freely,<sup>30</sup> which contributes to reducing employees' strain and anxiety resulting from role conflict. Furthermore, empowering leaders trust employees to exhibit high performance, create an open, fair and harmonious organizational atmosphere,<sup>29</sup> and ultimately alleviate the hindrance stress caused by interpersonal conflict and job insecurity. Finally, empowering leaders take the initiative to simplify rules and regulations and improve decision-making efficiency, which can mitigate red tape and bureaucratic restrictions in organizations<sup>27</sup> and weaken the obstacles caused by organizational administrative management systems for employees' daily work.

When individuals face conditions of high hindrance stress, they are more likely to adopt emotional coping strategies, such as withdrawal and rationalization. This research argues that hindrance stress inhibits employee improvisation. First, high levels of hindrance stress cause employees to develop vague and conflicting cognitions of their work content, completion methods and performance results. Employees invest most of their energy into the task of coping with in-role requirements,<sup>38</sup> and so they lack sufficient motivation to engage in extrarole improvisation. Second, hindrance stress, such as cumbersome approval procedures and a strongly political organizational atmosphere, impose external restrictions on employees' independent actions,<sup>36</sup> thus reducing the possibility of improvisation. Third, when employees perceive high levels of hindrance stress, they may believe that there is a low likelihood of interpersonal cooperation, and so their improvisation behaviors are difficult for coworkers to understand and support. Especially in the context of an unsafe work environment, the organization is less tolerant of employees' errors, and it becomes difficult for employees to obtain psychological safety,<sup>21</sup> thus inhibiting their improvisation. Finally, the low instrumental nature of hindrance stress inhibits employees' perception of resource input-output balance,<sup>39</sup> and the resulting spiral of resource loss prevents employees from initiating improvisation. Empirical studies have found that hindrance stress is negatively related to employees' innovation performance.<sup>37</sup>

Overall, empowering leaders offer employees the power to make their own decisions, create a harmonious and win-win working atmosphere, and eliminate redundant administrative approval procedures that may reduce employees' hindrance stress. Furthermore, low levels of hindrance stress improve employees' ability to deal with emergencies and stimulate improvisation. We thus propose the following hypothesis:

Hypothesis 2b: Hindrance stress significantly mediates the relationship between empowering leadership and employee improvisation.

## The Moderating Role of Psychological Availability

Psychological availability reflects an individual's assessment of his or her capability to cope with the physical, emotional, and cognitive demands of his or her job.<sup>23</sup> Individuals who have higher levels of psychological availability are fully engaged in their work and are capable of handling their job requirements and exhibiting high job performance.<sup>40</sup> Based on cognitive transactional theory, this research expects that psychological availability moderates the relationships between challenge stress/hindrance stress and improvisation.

Psychological availability may enhance the positive effect of challenge stress on employee improvisation. First, a high level of psychological availability indicates that the employee has been fully prepared for the physical,

emotional and cognitive requirements of his or her work.<sup>41</sup> Challenge stress and employees' work ability exhibit a positive match, which is more conducive to the employees' initiation of improvisation in response to emergencies. Second, a high level of psychological availability stimulates employees' self-realization.<sup>40</sup> Under conditions of high psychological availability, employees are more convinced that coping with challenge stress is instrumental; that is, they can obtain resources thereby, which makes them more willing to initiate improvisation. Furthermore, when psychological availability is high, employees exhibit higher degrees of dependence on their work and emotional commitment to the organization.<sup>42</sup> Coping with challenge stress allows employees to identify with their organization/work,<sup>43</sup> and high psychological availability contributes to strengthening the organizational/job identity generated by challenge stress. Employees may be more likely to implement improvisation under these circumstances. In contrast, when employees' psychological availability is low, they are not well prepared to deal with challenge stress and lack the ability to identify and integrate the available resources. There is no beneficial match between challenge stress and work ability, which impairs work engagement and reduces employees' identification with their work/organization, thus weakening the valence of challenge stress for employees and inhibiting their improvisation. We thus hypothesize the following:

Hypothesis 3a: Psychological availability significantly moderates the relationship between challenge stress and employee improvisation; when psychological availability is higher, the positive relationship between challenge stress and employee improvisation is stronger.

Psychological availability may weaken the negative effect of hindrance stress on employee improvisation. First, hindrance stress consumes employees' physical and cognitive resources. Employees with high psychological availability have rich resource reserves,<sup>41</sup> are able to stay focused and maintain flexible thinking when dealing with hindrance stress, and are more likely to exhibit improvisation to manage vague and uncertain tasks. Second, when employees perceive high levels of hindrance stress, they may feel as if their workplace is less tolerant of errors. Employees with high psychological availability possess a stronger ability to avoid risks and pay more attention to the benefits of extrarole behavior instead of worrying about the associated costs.<sup>42</sup> The frustration and ego depletion resulting from hindrance stress may be alleviated under conditions of psychological availability. Third, high psychological availability also indicates that an employee has stable emotional resources.<sup>23</sup> Hindrance stress leads to emotional exhaustion, but employees with high psychological availability thrive at work, which may weaken the job burnout caused by hindrance stress and stimulate improvisation. In contrast, when employees' psychological availability is low, they lack physical strength and cognitive resources. Hindrance stress exerts a stronger inhibitory effect on work engagement under conditions of low psychological availability,<sup>44</sup> which causes employees to focus on the costs of improvisation rather than the benefits, thus impeding improvisation even further. In addition, low psychological availability also causes employees to lack emotional stability. The depletion of emotional resources caused by hindrance stress fails to be repaired via the self-regulation process. Under the influence of a pessimistic work mood, the negative effect of hindrance stress on improvisation may be enhanced. Previous research has found that neuroticism exacerbates the negative relationship between hindrance stress and anger, subsequently leading to more counterproductive behavior.<sup>45</sup> Therefore, we propose the following hypothesis:

Hypothesis 3b: Psychological availability significantly moderates the relationship between hindrance stress and employee improvisation; when psychological availability is higher, the negative relationship between hindrance stress and employee improvisation is weaker.

Combining Hypotheses 2a and 3a, empowering leaders provide employees with work resources and attach importance to their skill learning and self-development, which may improve their challenge stress. Especially when employees have high psychological availability, they can quickly integrate the available resources to adopt positive coping strategies, for example, improvisation. Therefore, we propose the following hypothesis:

Hypothesis 4a: Psychological availability significantly moderates the indirect relationship between empowering leadership and employee improvisation through challenge stress.

Combining Hypotheses 2b and 3b, empowering leaders encourage employees to participate in decision-making, reduce the constraints associated with the administrative process, and provide employees with job autonomy, which is conducive to reducing their hindrance stress. When the employee's psychological availability is high, the negative impact

of hindrance stress on improvisation and the mediating role of hindrance stress in the relationship between empowering leadership and improvisation are weakened. We thus propose the following hypothesis:

Hypothesis 4b: Psychological availability significantly moderates the indirect relationship between empowering leadership and employee improvisation through hindrance stress.

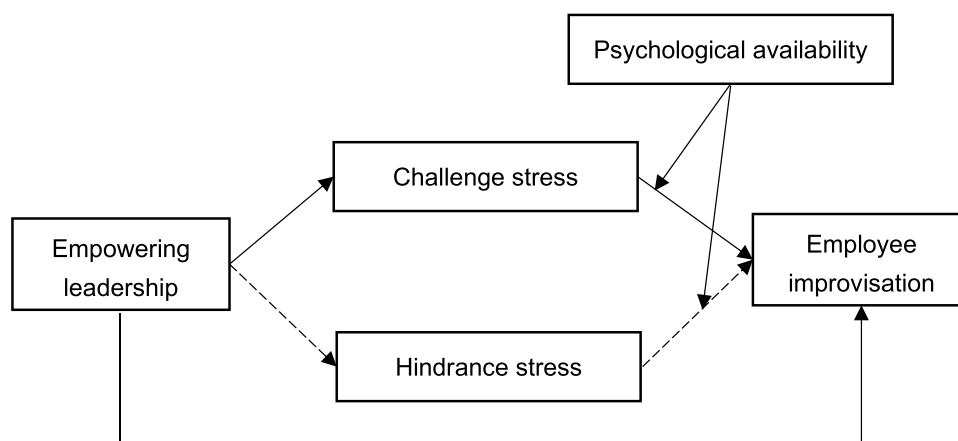
Based on these assumptions, the theoretical framework of this research is shown in Figure 1.

## Research Methodology

### Sample and Data Collection Procedure

This research investigated full-time employees engaged in R&D, creative design and implementation. Because these workers are directly connected with the actual needs and requirements of customers and because they assume the responsibility to create new products, develop updated technologies and provide personalized solutions, their daily work is characterized by unpredictability and urgency. Starting in 2021, we contacted the administrative committee of a large economic and technological development zone located in southern China and selected 55 companies with different sizes and ownership that operated in different industries by using a random sampling method by reference to a directory of 206 companies. We first contacted the human resources managers of these 55 companies to explain the research purpose, the selection criteria for the subjects and the reward for the survey. Subsequently, 43 companies agreed to support this survey, and the human resources managers distributed the electronic questionnaire link to employees who were responsible for R&D or creative design within their company. The industries involved in this sample included the production and manufacturing of products such as automobiles, medical equipment, and safety monitoring equipment and service providers working in fields such as software development, advertising and exhibition. We started by assigning a unique number to each company. Participants were first required to provide the company number and the last four digits of their mobile phone number. In each questionnaire, participants were reminded that the number was used only for the purposes of matching during the two-stage investigation. In addition, we explained to the participants that this survey was completely voluntary, that the data were strictly confidential, and that the data would be used only for academic research.

The questionnaire distribution process was divided into two stages. Empowering leadership, challenge stress, hindrance stress, and demographic information were measured in the first stage. A total of 331 questionnaires were returned. Two weeks later, human resources managers were asked to send the questionnaires to the employees who participated in the first-stage survey. Employees evaluated their psychological availability and improvisation behavior in the second-stage survey. A total of 295 questionnaires were collected at this stage. We used coding to match the two-stage questionnaires and eliminated invalid questionnaires (such as cases in which all items were answered with the same



**Figure 1** Theoretical model.

**Note:** The solid line represents positive relationship and the dotted line represents negative relationship.

number, the answer selection exhibited obvious regularity, or participants failed the attention test). Ultimately, 248 valid questionnaires were obtained, for an effective response rate of 84%.

The characteristics of the subjects were as follows: the proportion of males was 51%, the average age was 29 years, and 77.8% of the respondents were undergraduates; the sample was mainly composed of ordinary employees, accounting for 49% of the total, while the combined proportion of first- and middle-level managers was 45.8%, and the rest were high-level managers; 46.4% participants' tenure was less than three years, 34.1% had 4–6 years of work experience, and 19.3% participants had worked more than 7 years.

## Measures

All the scales used in this research were selected from mature Western literature and had exhibited good reliability and validity. The scales were first translated into Chinese and then translated back into English. One bilingual management professor was consulted to make minor modifications to guarantee that all the scales were accurately translated into Chinese. Unless otherwise specified, all items were scored on a 5-point Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree).

### Empowering Leadership

The 12-item scale developed by Ahearne et al (2005)<sup>26</sup> was used to measure empowering leadership. A sample item is “My manager helps me understand how my objectives and goals relate to that of the company”. Cronbach's  $\alpha$  for empowering leadership in this research was 0.87.

### Challenge Stress and Hindrance Stress

We used the 13-item scale developed by Zhang et al (2014)<sup>39</sup> to measure work stress, which included 6 items for challenge stress (a representative item is “having to work very hard”) and 7 items for hindrance stress (a representative item is “administrative hassles”). The response scale varied from 1 (produces no stress) to 5 (produces a great deal of stress). Cronbach's  $\alpha$  for challenge stress in this research was 0.81, and the value for hindrance stress was 0.81.

### Psychological Availability

We measured psychological availability using a 5-item scale developed by May et al (2004).<sup>46</sup> A sample item is “I am confident in my ability to handle competing demands at work”. Cronbach's  $\alpha$  for psychological availability in this research was 0.75.

### Employee Improvisation

We measured employee improvisation using a 7-item scale developed by Magni et al (2009).<sup>7</sup> A sample item is “I deal with unanticipated events on the spot”. Cronbach's  $\alpha$  for employee improvisation in this research was 0.84.

### Control Variables

Nisula and Kianto (2016) argued that demographic variables such as gender, age, education, position and tenure have impacts on individuals' beliefs regarding creativity in the workplace.<sup>8</sup> Subsequent studies on employee improvisation conducted by De Clercq et al (2021)<sup>4</sup> and Liu et al (2022)<sup>5</sup> controlled for the above variables in accordance with this suggestion. Therefore, this research included participants' gender, age, education, position and tenure as control variables.

## Analytical Tools

In this research, AMOS 21.0 software was used to conduct confirmatory factor analysis to test the discriminant validity of the focal variables. Second, we used SPSS 23.0 software to test the reliability of each variable and to estimate the possibility of common method bias. Third, hierarchical regression analysis was used to determine whether the direct effect of empowering leadership on employee improvisation, the mediating effect of challenge stress and hindrance stress, and the moderating effect of psychological availability existed. Finally, we used PROCESS V3.3 to calculate confidence intervals for the mediation effect and the moderated mediation effect to determine whether the relevant assumptions were valid.



## Results

### Confirmatory Factor Analysis and Common Method Bias Test

The confirmatory factor analysis results concerning empowering leadership, challenge stress, hindrance stress, psychological availability, and employee improvisation are shown in Table 1. The proposed five-factor model exhibited a better fit than alternative models ( $\chi^2 = 895.21$ ,  $df = 614$ ,  $CFI = 0.91$ ,  $TLI = 0.90$ ,  $RMSEA = 0.04$ ), indicating good discriminant validity among study variables. To control for the influence of common method bias on the conclusion, the main procedural remedies adopted in this study were that the confidentiality and anonymity of the questionnaire were emphasized to the subjects and the order of variables was adjusted, thus reducing the possibility of subjects being able to guess the purpose of the research. In statistical terms, this study also used Harman's single-factor test to estimate whether common method bias was a serious issue. The results of this test indicated that the largest factor explained 19.07% of the variance, which did not exceed the threshold of 40%.<sup>47</sup> Therefore, we believe that the research results were not seriously threatened by common method bias.

### Descriptive Statistics and Correlation Analysis

Table 2 shows the descriptive statistics and correlation analysis of all variables. The correlation between empowering leadership and employee improvisation was positive ( $r = 0.39$ ,  $p < 0.01$ ), and empowering leadership was positively correlated with challenge stress ( $r = 0.22$ ,  $p < 0.01$ ) and negatively correlated with hindrance stress ( $r = -0.16$ ,  $p < 0.05$ ). Challenge stress was positively associated with employee improvisation ( $r = 0.36$ ,  $p < 0.01$ ), and hindrance stress was negatively associated with employee improvisation ( $r = -0.28$ ,  $p < 0.01$ ). Although these results partially verified the research hypotheses, hierarchical regression analysis was necessary to investigate whether the hypotheses were supported.

**Table 1** Confirmatory Factor Analysis

Models	Factors	$\chi^2$	df	$\Delta\chi^2(\Delta df)$	CFI	TLI	RMSEA
1	EL;CS;HS;PA;EI	895.21	614		0.91	0.90	0.04
2	EL;CS+HS;PA;EL	1405.58	619	510.37(5)	0.74	0.72	0.07
3	EL;CS+HS;PA+EI	1638.60	622	743.39(8)	0.66	0.64	0.08
4	EL, CS+HS+PA+EI	1912.88	624	1017.67(10)	0.57	0.54	0.09
5	EL+CS+HS+PA+EI	2381.04	629	1485.83(15)	0.41	0.38	0.11

**Notes:** N=248.

**Abbreviations:** EL, empowering leadership; CS, challenge stress; HS, hindrance; PA, psychological availability; EI, employee improvisation.

**Table 2** Descriptive Statistical Results

Variables	1	2	3	4	5	6	7	8	9	10
1. Gender	1									
2. Age	-0.01	1								
3. Education	-0.03	0.05	1							
4. Position	0.13*	0.23**	0.07	1						
5. Tenure	0.03	0.69**	0.03	0.29**	1					
6. EL	0.08	0.120**	-0.07	0.07	0.21**	1				
7. CS	-0.03	0.16*	-0.03	0.10	0.16*	0.22**	1			
8. HS	0.10	0.01	0.01	-0.03	-0.18**	-0.16*	0.24**	1		
9. PA	0.01	0.03	-0.01	-0.07	0.03	0.08	0.15*	-0.03	1	
10. EI	0.04	0.31**	-0.07	0.20**	0.42**	0.39**	0.36**	-0.28**	0.12	1
Mean	0.51	29.18	3.94	1.83	2.68	3.60	3.58	2.30	3.65	3.92
SD	0.50	6.11	0.55	0.94	1.04	0.58	0.69	0.71	0.55	0.63

**Notes:** \* $p < 0.05$ , \*\* $p < 0.01$ . Gender: 1 = male, 0 = female. Education: 1 = junior high school or lower, 2 = high school or secondary vocational school, 3 = 3-year college, 4 = university, 5 = graduate school. Position: 1 = non-managerial employee, 2 = first-level manager, 3 = middle-level manager, 4 = high-level manager. Tenure: 1 = 1 year or lower, 2 = 1–3 years, 3 = 4–6 years, 4 = 7–10 years, 5 = more than 10 years.

**Abbreviations:** EL, empowering leadership; CS, challenge stress; HS, hindrance; PA, psychological availability; EI, employee improvisation.

## Hypothesis Testing

To reduce the impact of multicollinearity on this study, this research standardized the values of all the focal variables prior to conducting the hierarchical regression analysis.<sup>48</sup> The remainder of the hypothesis testing is organized as follows. First, we examined the direct effect between empowering leadership and employee improvisation. Subsequently, we tested the mediating roles of challenge stress and hindrance stress with respect to the effect of empowering leadership on employee improvisation. Third, we verified the moderating effects of psychological availability on the relationship between challenge/hindrance stress on employee improvisation. Finally, the moderated mediation effects were examined.

### Empowering Leadership and Employee Improvisation

The results of the direct and indirect regression analyses are shown in Table 3. As shown in Table 3, empowering leadership had a positive effect on employee improvisation ( $b = 0.31, p < 0.001$ , Model 6). Hypothesis 1 was thus supported.

### The Mediating Role of Challenge Stress

According to Table 3, we can see that empowering leadership positively predicted challenge stress ( $b = 0.19, p < 0.01$ , Model 2). When both empowering leadership and challenge stress were included in the regression equation, challenge stress had a positive effect on employee improvisation ( $b = 0.24, p < 0.001$ , Model 7), while the effect of empowering leadership on employee improvisation decreased ( $b = 0.26, p < 0.001$ , Model 7), thus suggesting that challenge stress may partially mediate the relationship between empowering leadership and employee improvisation. The results of the bootstrapping analysis are shown in Table 4. The indirect effect of challenge stress was significant ( $effect = 0.06$ , boot 95% CI [0.02, 0.11]), indicating that empowering leadership promoted employees' challenge stress and subsequently stimulated employee improvisation. Hypothesis 2a was thus validated.

### The Mediating Role of Hindrance Stress

As shown in Table 3, empowering leadership had a negative effect on hindrance stress ( $b = -0.15, p < 0.05$ , Model 4). When both empowering leadership and hindrance stress were included in the regression equation, hindrance stress negatively predicted employee improvisation ( $b = -0.18, p < 0.001$ , Model 8), and empowering leadership had a weaker impact on employee improvisation ( $b = 0.28, p < 0.001$ , Model 8), thus suggesting that hindrance stress may partially mediate the relationship between empowering leadership and employee improvisation. According to Table 4, the indirect effect of hindrance stress was significant ( $effect = 0.04$ , boot 95% CI [0.01, 0.08]), thus indicating that empowered leaders reduced hindrance stress and subsequently motivated employee improvisation. Hypothesis 2b was therefore supported.

### The Moderating Role of Psychological Availability

The regression analysis results concerning the moderating effect are shown in Table 5. The interaction term of challenge stress and psychological availability had a positive effect on employee improvisation ( $b = 0.15, p < 0.01$ , Model 2). Based on the recommendation of Aiken and West (1991),<sup>48</sup> this research plotted the effect of challenge stress on employee improvisation under different levels of psychological availability, and the results are shown in Figure 2. The positive effect of challenge stress on employee improvisation was stronger when psychological availability was higher ( $b = 0.44, SE = 0.08, p < 0.001$ ). However, when psychological availability was low, the effect of challenge stress on employee improvisation was not significant ( $b = 0.14, SE = 0.07, n.s.$ ). Therefore, Hypothesis 3a was supported.

As shown in Table 5, the interaction term of hindrance stress and psychological availability had a significant positive effect on employee improvisation ( $b = 0.24, p < 0.01$ , Model 4). Figure 3 illustrates the relationship between hindrance stress and employee improvisation under different levels of psychological availability. When psychological availability was high, the negative effect of hindrance stress on employee improvisation was not significant ( $b = 0.01, SE = 0.08, n.s.$ ). When psychological availability was low, hindrance stress was shown to have a negative effect on employee improvisation ( $b = -0.46, SE = 0.08, p < 0.001$ ). Therefore, Hypothesis 3b was supported.

**Table 3** Regression Results for Mediating Effects

	Challenge Stress		Hindrance Stress		Employee Improvisation				
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
<b>Control variables</b>									
Gender	-0.09	-0.12	0.23	0.25*	0.02	-0.02	0.01	0.02	0.09
Age	0.01	0.01	0.04**	0.05***	0.01	0.01	-0.01	0.01	0.01
Education	-0.09	-0.06	0.03	0.01	-0.17	-0.12	-0.11	-0.12	-0.10
Position	0.07	0.07	-0.01	-0.01	0.09	0.09	0.07	0.09	0.07
Tenure	0.09	0.06	-0.35***	-0.33***	0.35***	0.31***	0.30***	0.25***	0.20**
<b>Independent variable</b>									
EL		0.19**		-0.15*		0.31***	0.26***	0.28***	0.20***
<b>Mediator</b>									
CS							0.24***		0.33***
HS								-0.18***	-0.29***
R <sup>2</sup>	0.04	0.07	0.08	0.10	0.19	0.28	0.34	0.31	0.40
F	1.869	3.02**	4.26***	4.62***	11.43***	11.53***	17.30***	15.44***	20.20***

Notes: \*p < 0.05, \*\*p < 0.01, \*\*\*p < 0.001.

Abbreviations: EL, empowering leadership; CS, challenge stress; HS, hindrance.

**Table 4** Bootstrapping Results for Mediation Effect

Path	Effect	SE	LLCI	ULCI
EL→CS→EI	0.06	0.02	0.02	0.11
EL→HS→EI	0.04	0.02	0.01	0.08

**Abbreviations:** EL, Empowering leadership; CS, Challenge stress; HS, Hindrance stress; EI, Employee improvisation.

**Table 5** Regression Results for Moderating Effects

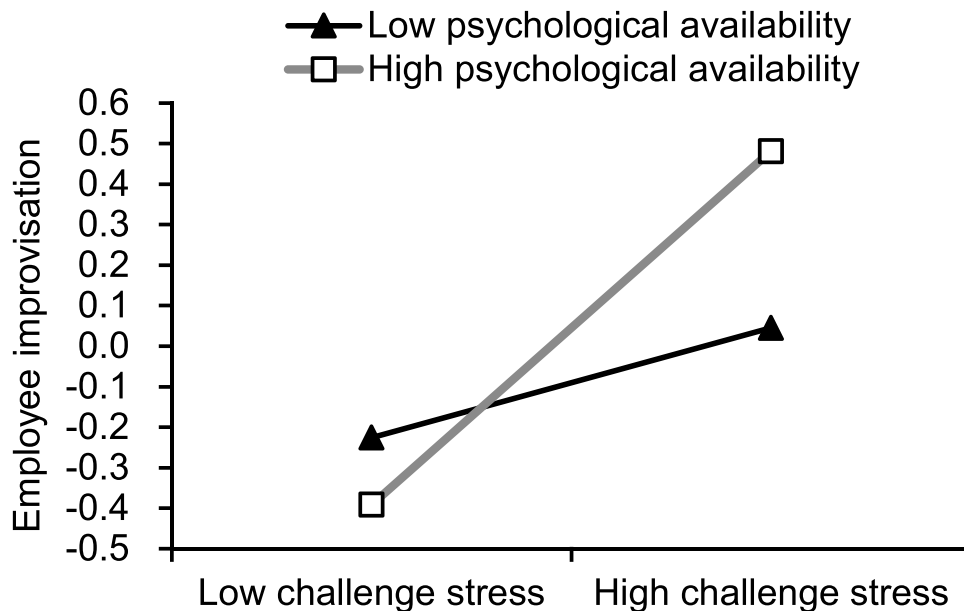
	Employee Improvisation			
	Model 1	Model 2	Model 3	Model 4
<b>Control variable</b>				
Gender	0.05	0.02	0.07	0.02
Age	0.01	0.00	0.02	0.01
Education	-0.14	-0.14	-0.16	-0.16
Position	0.08	0.07	0.10	0.10
Tenure	0.32***	0.31***	0.27***	0.30***
<b>Mediating variable</b>				
CS	0.28***	0.29***		
HS			-0.23***	-0.23***
<b>Moderating variable</b>				
PA	0.07	0.06	0.10	0.11*
<b>Interaction</b>				
CS×PA		0.15**		
HS×PA				0.24**
R <sup>2</sup>	0.28	0.30	0.25	0.30
F	13.12***	12.79***	11.36***	13.08***

**Notes:** \*p < 0.05, \*\*p < 0.01, \*\*\*p < 0.001.

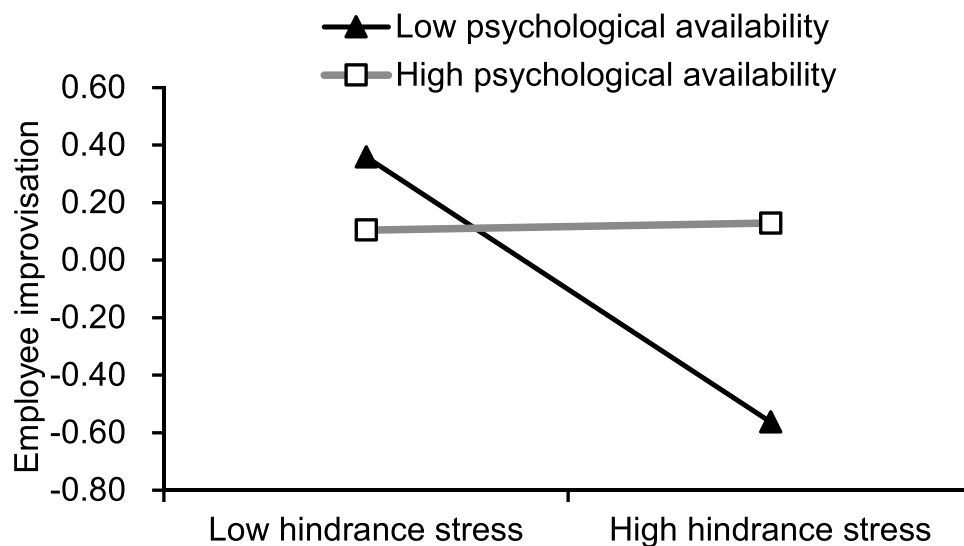
**Abbreviations:** CS, challenge stress; HS, hindrance; PA, psychological availability.

**The Moderated Mediation Effect Test**

This research further examined whether psychological availability moderated the mediating effect of challenge stress on the relationship between empowering leadership and employee improvisation. The results of the moderated mediation



**Figure 2** The moderating effect of psychological availability on challenge stress and employee improvisation.



**Figure 3** The moderating effect of psychological availability on hindrance stress and employee improvisation.

effect are shown in Table 6. As seen in Table 6, when psychological availability was higher, empowering leadership had a stronger indirect effect on employee improvisation via challenge stress ( $effect = 0.07$ ,  $BootSE = 0.03$ , boot 95% CI [0.02, 0.13]). When psychological availability was lower, the indirect effect between empowering leadership and employee improvisation via challenge stress was not significant ( $effect = 0.02$ ,  $BootSE = 0.02$ , boot 95% CI [-0.01, 0.06]). The indirect effects of challenge stress differed significantly between the high and low psychological availability conditions ( $diff = 0.05$ ,  $BootSE = 0.03$ , boot 95% CI [0.004, 0.110]). The index of the moderated mediation effect was also significant ( $Index = 0.02$ ,  $BootSE = 0.01$ , boot 95% CI [0.002, 0.055]). In summary, psychological availability moderated the indirect effect of empowering leadership on employee improvisation via challenge stress. Hypothesis 4a was thus supported.

This study further examined whether psychological availability moderated the mediating effect of hindrance stress on the relationship between empowering leadership and employee improvisation. According to Table 6, under conditions of high psychological availability, the mediating effect of empowering leadership on employee improvisation via hindrance stress was not significant ( $effect = -0.01$ ,  $BootSE = 0.01$ , boot 95% CI [-0.04, 0.02]). Under conditions of low psychological availability, empowering leadership had a significant mediating effect on employee improvisation via hindrance stress ( $effect = 0.06$ ,  $BootSE = 0.03$ , boot 95% CI [0.02, 0.12]). The indirect effects of hindrance stress differed

**Table 6** Bootstrapping Results for Moderated Mediation Effect

Psychological Availability	Employee Improvisation			
	Effect	SE	LLCI	ULCI
EL→CS→EI				
Low (-1SD)	0.02	0.02	-0.01	0.06
High (+1SD)	0.07	0.03	0.02	0.13
Difference	0.05	0.03	0.004	0.110
Index of moderated mediation effect	0.02	0.01	0.002	0.055
EL→HS→EI				
Low (-1SD)	0.06	0.03	0.02	0.12
High (+1SD)	-0.01	0.01	-0.04	0.02
Difference	-0.07	0.03	-0.14	-0.02
Index of moderated mediation effect	-0.03	0.02	-0.07	-0.01

**Abbreviations:** EL, Empowering leadership; CS, Challenge stress; HS, Hindrance stress; EI, Employee improvisation.

significantly between the high and low psychological availability conditions ( $diff = -0.07$ ,  $BootSE = 0.03$ , boot 95% CI  $[-0.14, -0.02]$ ). The index of the moderated mediation effect was also significant ( $Index = -0.03$ ,  $BootSE = 0.02$ , boot 95% CI  $[-0.07, -0.01]$ ). Therefore, psychological availability moderated the indirect effect of empowering leadership on employee improvisation via hindrance stress. Hypothesis 4b was thus supported.

## Discussion

Based on 248 valid samples collected over two stages, this study found that empowering leadership promoted employee improvisation via the dual path of increasing challenge stress and reducing hindrance stress. Psychological availability enhanced the positive effect of challenge stress on employee improvisation and weakened the negative effect of hindrance stress on employee improvisation. Moreover, psychological availability moderated the mediating effect of challenge stress/hindrance stress on the empowering leadership-employee improvisation relationship.

## Theoretical Implications

First, this research linked empowering leadership with employee improvisation, thus enriching both theoretical and empirical research on the contextual antecedents of employee improvisation. Existing studies have explored the influence of team characteristics<sup>1</sup> and organizational characteristics<sup>49</sup> on employee improvisation. However, leadership style has long been proposed by Cunha et al (2003)<sup>9</sup> as a critical antecedent, and only recently have researchers examined the direct effect of the relationship between entrepreneurial leadership<sup>5</sup> and leader humility<sup>6</sup> on employee improvisation. Empowering leadership is considered to be capable of creating favorable conditions for employee creativity and innovative behavior.<sup>35</sup> Magni and Maruping (2013) found that empowering leadership positively moderates the relationship between team improvisation and team performance and noted that future research should focus on the influence of empowering leadership on improvisation.<sup>3</sup> In response to this call, this research explored the effect of empowering leadership on employee improvisation and provided novel insights into the antecedents of improvisation. In addition, not all studies have found empowering leadership to have favorable outcomes.<sup>50</sup> By illustrating the positive relationship between empowering leadership and improvisation, this study deepens our understanding of the concept of empowering leadership and provides empirical evidence that empowering leadership has positive impacts on employees' extemporaneous behavior. Moreover, Kim et al (2018) conducted a meta-analysis of the research concerning empowering leadership and noted that empowering leadership may be regarded as a source of work stress because empowering leadership ensures that employees encounter challenging work and emphasizes autonomy and self-management; in turn, these initiatives increase the workload of employees.<sup>12</sup> Based on cognitive transactional theory, this study found that improvisation satisfied the characteristics of problem-focused coping strategies and promoted employee behavioral performance in the context of the stressor represented by empowering leadership. Furthermore, existing research on improvisation has focused on surveying practitioners in the retail<sup>2,3</sup> and tourism services industries.<sup>17</sup> This study selected working groups focused on creativity generation and product development from the product manufacturing, advertising, and exhibition service industries, thus expanding the scope of the survey respondents and enriching our understanding of employee improvisation in different industries.

Second, this research explored the ways in which empowering leadership influenced employee improvisation from the perspective of challenge stress/hindrance stress. Based on self-determination theory, conservation of resources theory, social information processing theory and social exchange theory, previous studies have explored work meaning,<sup>30</sup> organization-based self-esteem,<sup>51</sup> state promotion focus,<sup>32</sup> and leader-member exchange<sup>52</sup> as mediating mechanisms in the relationship between empowering leadership and job performance. Although theoretical studies have claimed that improvisation is caused by the stimulation resulting from specific forms of stress,<sup>17</sup> few studies have explored work stress as the proximal antecedent of employee improvisation. In line with cognitive transactional theory, this research discussed the mechanism underlying the relationship between empowering leadership and employee improvisation by introducing challenge stress and hindrance stress to this context. The results showed that empowering leadership increased challenge stress and reduced hindrance stress as a means of promoting improvisation. Both challenge stress and hindrance stress played a partially mediating role in this process. Most existing studies have focused on empowering leaders to positively influence followers' motivation, resources, and work attitudes, which is regarded as an enabling process; however, such

studies have ignored the fact that when empowering leadership provides autonomy and responsibility to an excessive degree, empowering leadership may also cause tension for followers and become a burden for them.<sup>50</sup> Therefore, Cheong et al (2019) suggested that future research should explore contradictory mechanisms to explain the relationship between empowering leadership and work-related outcomes.<sup>19</sup> In this study, challenge stress and hindrance stress were selected as a pair of contradictory mediating mechanisms to explore the influence of empowering leadership on employee improvisation, thus enriching the practical application of cognitive appraisal and the coping process emphasized by cognitive transactional theory. The sample data also confirmed that empowering leadership, as conceptualized by Cheong et al (2019),<sup>19</sup> stimulates employees' differential stress experiences, that is, it increases challenge stress and reduces hindrance stress. Ambivalent stress states further had opposing effects on improvisation. According to the meta-analysis of the impact of challenge-hindrance stress by Mazzola and Disselhorst (2019),<sup>53</sup> challenge stress and hindrance stress have significant positive and negative effects on only a few variables, such as positive affect, which suggests that subsequent research should expand the scope of the outcome variables that are taken into consideration to support this classification of work stress. This research found that employee improvisation had significant opposing relationships with challenge stress and hindrance stress, thus providing support for the propositions of the challenge-hindrance stress model. Moreover, since Cavanaugh et al (2000)<sup>20</sup> proposed the concept of challenge stress/hindrance stress, over the past 20 years, most studies in this context have discussed the consequences of such stress, while few have focused on its antecedents.<sup>38</sup> This research verified empowering leadership as an antecedent of challenge stress/hindrance stress, thus addressing the research gap in the field of dual work stress in a preliminary way.

Third, this research examined the moderating effect of psychological availability on the relationship between challenge stress/hindrance stress and employee improvisation and identified the boundary conditions of work stress with respect to personal resources. Previous studies have examined the moderating effects of neuroticism,<sup>45</sup> psychological capital,<sup>44</sup> and conscientiousness<sup>54</sup> on challenge stress/hindrance stress. The generation of improvisation is not only influenced by situational stimuli but also depends on whether an employee can integrate and utilize the available resources. This research tested the moderating effect of psychological availability, thus enriching our understanding of the boundary conditions of challenge stress/hindrance stress and providing a more fine-grained understanding of the relationship between work stress and improvisation. With respect to the application of cognitive transactional theory, existing studies have focused more on the direct effect of cognitive appraisal on coping,<sup>55,56</sup> ignoring the fact that the choice of individual coping strategies is also related to the resources that individuals possess. By exploring the moderating role of psychological availability, this study comprehensively applied cognitive transactional theory, highlighted the importance of individual resources for coping strategy selection, and suggested that subsequent research should focus on the contingent effects of individual factors on the relationship between cognitive appraisal and coping. Existing studies have mostly regarded psychological availability as a mediating factor with respect to the consequences of positive/negative workplace social interaction.<sup>42,57,58</sup> Consistent with the research conducted by Li and Tong (2021),<sup>59</sup> this study employed psychological availability as a moderating variable and found that the level of psychological availability not only affected employee improvisation but also had a tremendous influence on the indirect effect of empowering leadership on employee improvisation via challenge stress and hindrance stress.

## Practical Implications

First, employee improvisation helps organizations cope with dynamic and complex external environments.<sup>60</sup> This research found that empowering leadership activates employee improvisation, encouraging organizational managers to adopt this leadership style, which is beneficial with respect to improve organizational flexibility and obtaining a competitive advantage. In daily work, leaders are encouraged to provide employees with job autonomy, actively transfer information related to work meaning, and trust employees to achieve high performance. Meanwhile, leaders should take the initiative to simplify the organization's redundant and tedious approval reporting system and improve employees' participation in decision-making.<sup>35</sup> To encourage leaders to exhibit empowering leadership, organizations may adopt the following management policies and practices: the incorporation of empowering behavior into the scope of leadership performance appraisal, improvement of the reward system and projects by giving job promotions or material rewards to leaders who successfully demonstrate an empowering style, supplementing the criteria for selecting leaders by

including the requirements for empowering leadership, such as sharing power, providing motivation and developmental support, and conducting regular training focused on leadership development, thus enabling leaders to acquire and apply the skills that are relevant to empowering leadership.

Second, psychological availability represents employees' capability to integrate and utilize the available resources and is a key factor in allowing employees to initiate improvisation. On the one hand, managers should provide material, social and emotional support to employees, such as by ensuring convenient working conditions, caring about employees' career growth and attaching importance to their contributions, to expand the channels by which employees can acquire resources.<sup>40</sup> In terms of policy practice, organizational managers can sign idiosyncratic deals with employees, establish a flexible work system, and provide psychological counseling services. Through these channels, the organization can grasp the working states of employees and provide employees with resource support in a timely manner. On the other hand, the results also suggest that organizations should focus on employees' demand-ability fit when designing jobs. Placing employees with high psychological availability in challenging work environments and providing them with the power to make independent decisions can stimulate improvisation, thus transforming the threats caused by environmental uncertainty into opportunities for the generation of creativity.

## Limitations and Directions for Future Research

With respect to methodology, first, the variables investigated in this research were all self-evaluated, which may have led to common method bias. We emphasized the anonymity of the survey and the confidentiality of the data to the subjects before administering the questionnaire survey and employed a two-stage data collection procedure to reduce the influence of common method bias. According to Evans (1985),<sup>61</sup> severe common method bias would weaken the moderating effect. However, the moderating effect in this study was significant, indicating that this study was not seriously affected by common method bias. In future studies, employee improvisation can be evaluated by supervisors to reduce common method bias further. Second, despite the two-stage investigation employed in this research, we were unable to infer any causal relationships. Future studies should use longitudinal data collection and explore these causal relationships using a cross-lagged model. Third, the survey sample referenced by this study was targeted at workers focused on creative generation, and it is uncertain whether the research conclusions can be extended to workers with low requirements for creativity. Future research should collect data from different work groups over a wider range to verify these research conclusions.

With respect to theory, this study focused on the mediating role of work stress in the relationship between empowering leadership and employee improvisation. When empowering leadership, challenge stress, and hindrance stress were included in the regression model, empowering leadership continued to positively predict employee improvisation ( $b = 0.20, p < 0.001$ , Model 9, Table 3), indicating that other paths for the effect of empowering leadership on employee improvisation may exist. We encourage future research to take into account other mediating mechanisms. In addition, the effectiveness of leadership is context dependent; for example, high-involvement human resource practices can also be used to empower employees.<sup>62</sup> Future research can explore the interaction effect between high-involvement human resource practices and empowering leadership on employee improvisation and test whether these two contextual factors have a synergistic or substitution effect on employee improvisation. This research explored the direct effect of challenge stress/hindrance stress on employee improvisation. Future research can refine this process further, that is, by investigating the psychological mechanisms through which work stress can influence improvisation. Exploring these mechanisms could help complete the logical chain between work stress and improvisation.

## Conclusion

The sustainable development of the organization depends on employees' bottom-up change behavior, for example, improvisation. Despite increasing amounts of research, we continue to have limited knowledge of the relationship between empowering leadership and employee improvisation. This study found that empowering leadership promoted employee improvisation and that challenge/hindrance stress mediated this relationship. Furthermore, psychological availability strengthened the positive relationship between challenge stress and employee improvisation and weakened the negative relationship between hindrance stress and employee improvisation. Psychological availability also moderated the indirect empowering leadership-employee improvisation relationship via challenge stress/hindrance stress. Our



findings also have practical implications. To motivate employee improvisation, organizational leaders should exhibit empowering leadership. Furthermore, to effectively manage employee work stress, organizations should focus on the needs of employees and actively provide support to improve their psychological availability.

## Data Sharing Statement

The datasets used or analyzed in this study are available from the corresponding author on reasonable request.

## Ethical Statement

The study was conducted in accordance with the principles of the Declaration of Helsinki and was received approval from the Soochow University, School of Business Institutional Review Board. All of the participants who were invited agreed to take part in the study and provided written informed consent.

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## Disclosure

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