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CHALLENGE-HINDRANCE STRESSORS AND GIG WORKERS' ENGAGEMENT: A MODERATED MEDIATION MODEL

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Abstract. *According to transactional theory of stress, this paper establishes a conceptual framework and investigates the relationship between the different work stressors and employee engagement especially the mediating role of problem-solving pondering and the moderating role of colleague support. This paper presents a regression analysis of questionnaire data from 371 gig workers in the industries of delivery riders, online taxi drivers and network hosts in China. This paper explores the positive and negative effects of different job stressors and provides new ideas for organizations to improve employee engagement while enriching research related to job stressors.*
Keywords: Challenge-hindrance stressors, Engagement, Gig workers, Colleague support

1. **Introduction.** With the development of technology in the digital economy and changes in people's eating habits and travel patterns, a large number of jobs have been created for workers. In the context of the gig economy, gig workers break the traditional time and space constraints and participate more flexibly in the work of the employer, but the greater separation and autonomy of labor makes it possible for individual gig workers to have no direct contact with other people [1]. Gig workers do not enjoy the same social rights and benefits as regular workers, and the burden of pension and medical costs can increase their instability and insecurity [2]. If these work stresses are not properly managed, they will be accompanied by a significant decrease in the level of employee engagement. And few scholars, both foreign and domestic, have studied the psychological state of workers in the gig economy from organizational behavioral perspective. They are mostly qualitative analyses and news reports and focus more on the working environment of casual workers and the lower employment and supervision costs for enterprises [3]. Therefore, the study focuses on the influence of different work stressors on the level of engagement of gig workers from organizational behavioral perspective. This study expands perspective on challenge-hindrance stressors. In the following sections, we based on the transactional theory of stress, with problem-solving pondering as a mediating variable and colleague support as a moderating variable in the process of "cognitive evaluation-coping strategies-outcome". Next, the hypothesized relationships are presented. The methodology used and survey findings are presented, followed by a conclusion of the implication of these findings for theory and practice. Findings revealed that different stressors have different effects on engagement.

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2. Theory and Hypotheses.

2.1. Transactional theory of stress.

Transactional theory of stress is an assessment-based theory of stress that describes a subjective process involving cognitive appraisal and coping responses process [4]. The transactional theory of stress states that stress does not exist in the person or environment alone, but in the combination of person and environment, that the nature of stress is a relationship between person and environment.

2.2. Challenge-hindrance stressors and employee engagement.

Cavanaugh et al. [5] classified the stressors into two broader categories: challenge stressors (CSs) and hindrance stressors (HSs). CSs refer to "manageable and challenging job-related demands or conditions like workload, and responsibilities" that relate to potential opportunities for personal growth, whereas HSs are "threatening and unmanageable job demands that include job insecurity, etc".

CSs can trigger positive emotions in individuals and has the potential to contribute to their growth and progress. When faced with challenging pressure, individuals tend to have higher expectations of themselves, adopt a positive problem-solving approach to cope, and have a greater desire to be challenged and fully engaged in their work. Jannesari and Sullivan [6] found that CSs helped to increase intention to remain. Based on transactional theory of stress, when individuals rate stress as challenging it will stimulate self-improvement behavior in gig workers, and in the process of self-improvement it is highly likely to increase their level of work engagement.

HSs are evaluated by employees as potentially harmful, highly motivating negative emotions and often hinder the growth of the individual. Therefore, according to transactional theory of stress, when gig workers assess job stress as hindering threatening, individuals will show less enthusiasm, and deal with problems in a negative way; this uncertainty threatening stress will prevent individuals from making decisions about proactive coping strategies, leading to lower levels of engagement. A study by Sonnentag et al. [7] found that hindrance stress was detrimental to morning energy recovery, resulting in employees' lack of enthusiasm for the new day. Hence, we hypothesize:

H1a: CSs are positively related to employee engagement.

H1b: HSs are negatively related to employee engagement.

2.3. The mediation role of problem-solving pondering.

According to the Zeigarnik effect [8], individuals are more likely to think about information related to an unfinished task than information related to a completed task. When individuals are faced with CSs, they may be prompted to think about work-related matters and are able to devote themselves to their work. According to the transactional theory of stress, individuals are more willing to respond positively when they appraise situations as challenging, and individuals who make challenging appraisals will exert more effort than those who make threatening appraisals.

When employees are faced with HSs, they do not believe that their efforts and learning can solve the current threats they face and their personal growth and progress towards achieving their goals are unnecessarily hindered, which in turn creates more feelings of helplessness and maladaptive coping strategies such as avoiding work [9]. According to the transactional theory of stress, when individuals evaluate situations as damaging, they are prone to negative emotions such as fear and anxiety and thus choose emotional coping strategies. We thus hypothesize:

H2a: CSs are positively related to problem-solving pondering.

H2b: HSs are negatively related to problem-solving pondering.

Problem-solving pondering is conceptualized as a goal-oriented cognitive process where the individual's goal is to reduce the discrepancy between the current state and the desired state. Flaxman et al. [10] found that positive thinking about work mediated the positive

relationship between perfectionist effort and work engagement. Thus, according to the transactional theory of stress, when individuals develop positive emotions in order to proactively cope with work stress, they will in turn produce good work outcomes, such as work engagement. We thus hypothesize:

H3: Problem-solving pondering is positively related to employee engagement.

Combining H1a, H1b, H2a, H2b, and H3, we further hypothesize:

H4a: Problem-solving pondering mediates the relationship between CSs and employee engagement.

H4b: Problem-solving pondering mediates the relationship between HSs and employee engagement.

2.4. **The moderation role of colleague support.** Based on the transactional theory of stress, when faced with the stress of the job itself or the loss of job characteristics, individuals engage in problem-solving pondering behavior as a coping strategy inseparable from the assessment of internal and external resources.

Colleague support as one of the organizational alternatives [11], when there is adequate colleague support in the organization, employees can easily get help at work and emotional encouragement from their colleagues, thus categorizing themselves as one with their colleagues. Based on the transactional theory of stress, perceived colleague support as an important contextual resource, when individuals are faced with work stress when they assess that the external environment is more rewarding and that they are confident enough to overcome this stress, they decide to change their perception of work stress from negative and attritional to positive and challenging, which leads to contemplation of problem-solving, thus increasing their work engagement to enhance. Hence, we hypothesize:

H5a: Colleague support moderates the relationship between CSs and problem-solving pondering.

H5b: Colleague support moderates the relationship between HSs and problem-solving pondering.

Combining H4a, H4b, H5a, and H5b, we further propose that colleague support may moderate the indirect effect of challenge-hindrance stressors on employee engagement via problem-solving pondering, thereby resulting in moderated mediation. Thus, we hypothesize:

H6a: Colleague support moderates the mediating effect of problem-solving pondering between CSs and employee engagement.

H6b: Colleague support moderates the mediating effect of problem-solving pondering between HSs and employee engagement.

The hypotheses tested in this study are summarized in Figure 1.

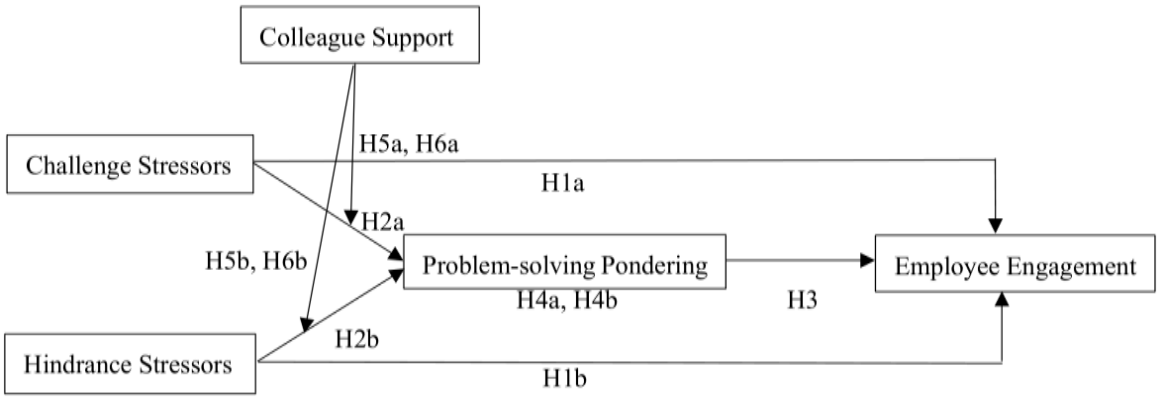

FIGURE 1. Theoretical model

3. **Methods.**

3.1. **Participants and procedure.**

During the COVID-19, this study used a questionnaire survey method. In order to obtain a diverse sample of gig workers and minimize systematic bias, we recruited participants through personal and professional networks. Our sample comprised 371 gig workers from Beijing, Shanghai, Liaoning Province, China and others. The descriptive statistics for the participants show that 48.2% were women, 62.5% were married, 33.7% were full-time jobs, 35.3% were 26-35 years old, 27.8% were 36-40 years old and other ages accounted for 36.9%. Regarding education level, 42.3% had a diploma, 39.1% held a bachelor's degree, and 10.5% had postgraduate education or higher. Participants came from different industries, including transportation (24.0%), delivery service (10.2%), sharing accommodation (12.1%), webcast (21.6%), professional skills services (19.9%), content creation (7.0%), knowledge payment (3.0%), and others (2.2%).

3.2. **Measures.**

All measures were presented in Chinese. Two-way translation was used to translate the scales for variables from the Western literature into Chinese. All measures used 5-point Likert scales.

Challenge and Hindrance Stressors. We used the 11-item scale (six challenge items, five hindrance items) of Cavanaugh et al. [5] to measure challenge and hindrance stressors. This study takes account of the actual situation in China and among gig workers, by adding an item developed by Chinese scholars Liu et al. [12] to measure HSs based on the study by Cavanaugh et al. [5]. Therefore, the final scale included six items for challenge stressors and six items for hindrance stressors.

We conducted confirmatory factor analyses (CFAs) to compare a single-factor model with a two-factor model for challenge and hindrance stressors. Results for CFA revealed that a two-factor structure for CSs and HSs (six items each) provided a better fit ($\chi^2 = 54.823$, comparative fit index [CFI] = 0.99, goodness-of-fit index [GFI] = 0.98, incremental fit index [IFI] = 0.99, and root mean square error of approximation [RMSEA] = 0.01) as compared to a single-factor structure ($\chi^2 = 654.327$, CFI = 0.70, GFI = 0.66, IFI = 0.79, and RMSEA = 0.17). The chi-square difference test indicated a significant difference ($\Delta\chi^2 = 599.504$, $\Delta df = 1$) in both models, providing further evidence for the discriminant validity of the variables. The internal consistency reliability coefficient (α) for the six-item challenge stressors was 0.85 and hindrance stressors was 0.90.

Problem-Solving Pondering. The Problem-Solving Pondering dimension of the three-dimensional Work-Related Rumination Questionnaire [13] was used. In this study, the results of the SPSS items were analyzed and four items were finally retained for measurement. The internal consistency reliability coefficient (α) for the four-item problem-solving pondering was 0.84.

Colleague Support. Colleague support was measured using the four items developed by Ganster et al. [14]. In this study, the internal consistency reliability coefficient (α) was 0.84.

Employee Engagement. We used the 5-item scale of Saks [15] to measure employee engagement. One of the items reverses scoring. Cronbach's $\alpha = 0.90$.

Control Variables. This study controlled for the effects of the following demographic variables: gender, age, marriage, educational level, work form, and working seniority.

4. **Results.**

4.1. **Preliminary analysis.**

Confirmatory factor analysis. To test the construct differentiation of the variables, we conducted a confirmatory factor analysis with AMOS23.0. The results are reported in Table 1. Compared with the other four models, the five-factor

Table 1. Model fit results for confirmatory factor analyses

Model	χ^2/df	GFI	CFI	RMSEA	TLI
Five-factor model	1.068***	0.943	0.997	0.014	0.996
Four-factor model	4.401***	0.682	0.837	0.096	0.818
Three-factor model	5.766***	0.598	0.769	0.113	0.745
Two-factor model	5.744***	0.600	0.768	0.113	0.747
One-factor model	6.297***	0.599	0.741	0.120	0.717

Notes: N = 371; ***$p < 0.001$; GFI = goodness-of-fit index; CFI = comparative fit index; TLI = Tucker-Lewis index; RMSEA = root mean squared error of approximation.
Five-factor model: CSs, HSs, Problem-Solving Pondering, Colleague Support, Employee Engagement;
Four-factor model: CSs + HSs, Problem-Solving Pondering, Colleague Support, Employee Engagement;
Three-factor model: CSs + HSs, Problem-Solving Pondering + Colleague Support, Employee Engagement;
Two-factor model: CSs + HSs, Problem-Solving Pondering + Colleague Support + Employee Engagement;
One-factor model: CSs + HSs + Problem-Solving Pondering + Colleague Support + Employee Engagement.

Table 2. Means, standard deviations, and correlations among study variables

Variable	Mean	SD	1	2	3	4	5
1. Challenge Stressors	2.71	0.87	**0.85**				
2. Hindrance Stressors	2.51	1.04	−0.356**	**0.90**			
3. Problem-Solving Pondering	3.10	1.02	0.741**	−0.656**	**0.86**		
4. Colleague Support	3.42	0.98	0.111*	−0.396**	0.502**	**0.84**	
5. Employee Engagement	3.02	1.05	0.757**	−0.562**	0.909**	0.560**	**0.90**

Notes: N = 371; *$p < 0.05$; **$p < 0.01$. Bold figures on the diagonals are scale reliabilities (Cronbach's alpha). Two-tailed tests.

model was the best fit, which indicates that the five variables in this study possess good discriminant validity and that these are five different constructs.

Descriptive statistics analysis. In Table 2, the results of the descriptive statistical analysis of the variables (mean values, standard deviations, and correlation coefficients) are presented. The hypothesized relationships among the study variables appear to be well represented in the correlations. Specifically, CSs were positively related to problem-solving pondering ($r = 0.741$, $p < 0.01$) and employee engagement ($r = 0.757$, $p < 0.01$). HSs were negatively related to problem-solving pondering ($r = -0.656$, $p < 0.01$) and employee engagement ($r = -0.562$, $p < 0.01$). Problem-solving pondering was positively related to employee engagement ($r = 0.909$, $p < 0.01$).

4.2. **Testing of hypotheses.** We tested the hypotheses presented in this study via path analysis using Mplus 8.3.

As shown in Table 4, CSs have a significant positive effect on employee engagement ($b = 0.418$) and problem-solving pondering ($b = 0.838$). In addition, HSs have a significant negative effect on employee engagement ($b = -0.076$) and problem-solving pondering ($b = -0.418$). Hence, H1a, H1b, H2a and H2b were supported. Problem-solving pondering was positively related to employee engagement ($b = 0.520$). Thus, H3 was supported. We further examined whether problem-solving pondering mediated the relationship between challenge-hindrance stressors and employee engagement. As shown in Table 3, the indirect effect of CSs on employee engagement via problem-solving pondering was 0.436, with a

TABLE 3. The indirect effects of the independent variables on employee engagement

	Mediator	Effect	SE	Boot 95% CI
Challenge Stressors	Problem-Solving Pondering	0.436***	0.053	[0.334, 0.541]
Hindrance Stressors	Problem-Solving Pondering	−0.500***	0.036	[−0.573, −0.430]

Notes: N = 371; *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$; Boot 95% CI, Boot 95% Confidence Interval.

TABLE 4. Moderated mediation model results

Dependent variable	Problem-Solving Pondering		Employee Engagement	
Predictor variable	*b*	SE	*b*	SE
Independent variable				
CSs	0.838***	0.026	0.418***	0.057
HSs	−0.418***	0.041	−0.076**	0.032
Mediator				
Problem-Solving Pondering			0.520***	0.060
Moderator				
Colleague Support	0.469***	0.024		
Interaction				
CSs × Colleague Support	0.085***	0.024		
Intercepts	−0.008	0.025	3.020***	0.021
Residual Variances	0.228***	0.019	0.152***	0.013
HSs × Colleague Support	−0.089**	0.026		
Intercepts	−0.036	0.041	3.023***	0.025
Residual Variances	0.498***	0.037	0.173***	0.017

Paths	Moderator	Level	Estimate	Boot 95% CI
CSs → PSP → EE	Colleague Support	High	0.479	[0.362, 0.595]
		Low	0.393	[0.299, 0.491]
		Difference	0.087	[0.040, 0.142]
HSs → PSP → EE	Colleague Support	High	−0.581	[−0.673, −0.493]
		Low	−0.420	[−0.500, −0.343]
		Difference	−0.161	[−0.254, 0.068]

Notes: N = 371; *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$; The *b* values are unstandardized regression coefficients; PSP, Problem-Solving Pondering; EE, Employee Engagement; Boot 95% CI, Boot 95% Confidence Interval.

95% confidence interval (CI) of [0.334, 0.541]. The indirect effect of HSs on employee engagement via problem-solving pondering was −0.500, with a 95% confidence interval (CI) of [−0.573, −0.430]. Thus, both H4a and H4b were supported.

To test hypotheses 5a and 5b more accurately, the variables of interest were first standardized so as to reduce the interference of multicollinearity on the results. As Table 4 shows, the interaction term of CSs and colleague support has a significant positive effect on problem-solving pondering ($b = 0.085$). Hypothesis 5a was supported. We plotted the interactions at conditional values of colleague support (see Figure 2). The figure shows that the relationship between CSs and problem-solving pondering tends to be more positive when colleague support is high rather than low. The interaction term of HSs and colleague support has not a significant negative effect on problem-solving pondering ($b = -0.089$), and hypothesis 5b was supported. We plotted the interactions at conditional values of colleague support (see Figure 2). It shows that when colleague support is high, they still reported higher levels of problem-solving pondering.

To test the moderated mediation effect, we followed the procedures suggested by Edwards and Lambert [16]. The results showed that the indirect effect of CSs on employee

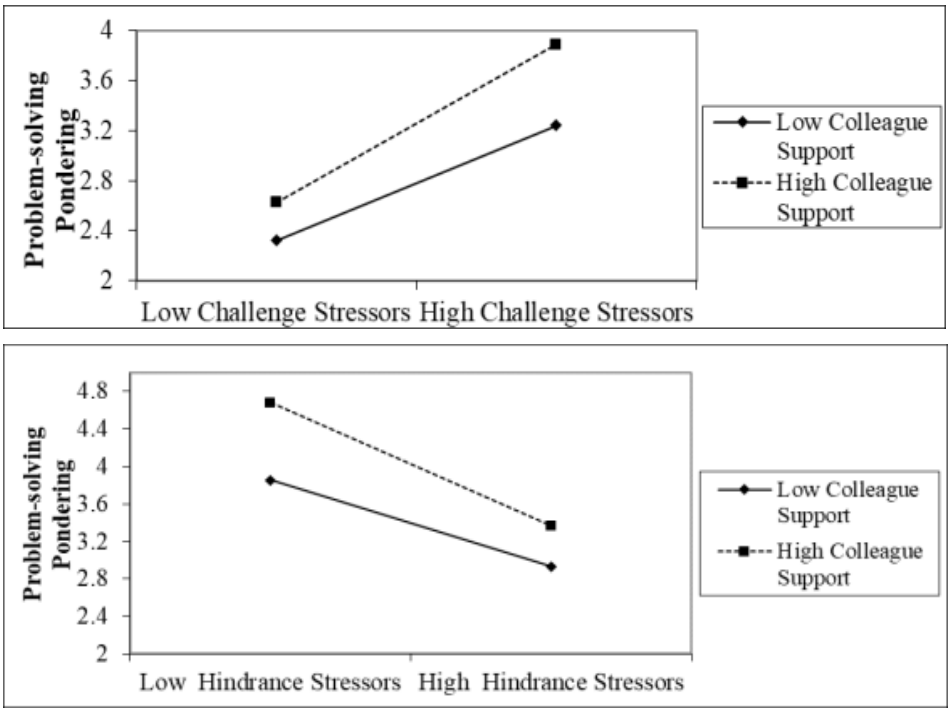

FIGURE 2. Interaction between colleague support and challenge-hindrance stressors

engagement via problem-solving pondering was significant when colleague support was high (estimate = 0.479, 95% CIs [0.362, 0.595]), when colleague support was low (estimate = 0.393, 95% CIs [0.299, 0.491]). The indirect effect of HSs on employee engagement via problem-solving pondering was significant when colleague was high (estimate = −0.581, 95% CIs [−0.673, −0.493]), when colleague support was low (estimate = −0.420, 95% CIs [−0.500, −0.343]). Thus, we found support for H6a and H6b.

5. **Conclusions.** According to transactional theory of stress, findings revealed that CSs were positively related to problem-solving pondering and employee engagement; however, HSs were negatively related to problem-solving pondering and employee engagement. Problem-solving pondering mediates the link between challenge-hindrance stressors and employee engagement. Moreover, colleague support moderates the mediating effect of problem-solving pondering between challenge-hindrance stressors and employee engagement.

5.1. **Theoretical implications.** Firstly, the research perspective on challenge-hindrance stressors has been expanded. The literature has found a large number of studies exploring the effects of various antecedent variables on the work attitudes and behaviors of paid groups such as teachers, doctors and industrial workers based. This paper examines the effects of different job stressors among gig workers, providing a new experimental perspective for the study of job stress and the gig economy.

In addition, the role of different job stressors has been revealed, enriching the research on employee engagement. In recent years, the positive influences on employee engagement have mostly been studied from a positive perspective, with less research on the negative factors, and the study lacks comprehensiveness.

5.2. **Practical implications.** Firstly, the empirical study of the impact of challenge-hindrance stressors on employee engagement in the context of the gig economy can provide an understanding of the current state of engagement of gig workers, enabling companies to alarm for talent retention on the platform. For example, regular training for platform gig workers can make employees more aware of the requirements of the company.

Additionally, studying the impact of different dimensional stressors on employee engagement can help platforms or enterprises to manage the work stress of gig workers in a targeted manner, take measures such as widening the communication channels between platforms and employees. Business managers should develop problem-solving skills in their employees and improve the emotional management of gig workers. Meanwhile, the platform should also advocate mutual assistance among colleagues in the process of improving the stress state, especially in assisting each other at work and enlightening each other physically and mentally, in order to moderate the negative effects of stress.

5.3. **Limitations and future directions.** Firstly, the study used a cross-sectional research design to obtain data, which is not yet convincing for causal inference of the variables involved in the study. Future studies should collect longitudinal data over a longer period for more rigorous testing to enhance the causal explanatory power of the corresponding theoretical models.

Furthermore, both challenging and hindering stressors may co-exist, whether the two lead to problem-solving pondering the existence of offsetting or compensatory mechanisms in the direction of triggering employee engagement. Future studies can use the polynomial response surface analysis through the four scenarios (high-high, low-low, high-low, low-high) formed by the interaction between the CSs and HSs to explore the relationship between challenge-hindrance stressors and employee engagement.

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