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The Relationship between Work Connectivity Behavior After-hours and Teachers' Job Performance: A Moderated Mediation Model

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Abstract: *From the perspective of COR theory and based on JDR model, the research explores the relationship between work connectivity behavior after-hours and teachers' job performance including their influence path. Through the investigation and data collection of 542 senior high school teachers, the study draws the following conclusions: ① Work connectivity behavior after-hours has a negative impact on work performance ② Work connectivity behavior after-hours has a positive effect on job burnout ③ Job burnout partially mediates the relationship between work connectivity behavior after-hours and job performance ④ Role pressure positively moderates the effect of work connectivity behavior after-hours on job performance through job burnout.*

Keywords: *Work connectivity behavior after-hours, Role pressure, Job burnout, Job performance*

1. Introduction

With the rapid development of communication technology, massive instant messaging tools have been used. These new interactive ways make remote communication more convenient, which is not limited by time and space. Work connectivity behavior has also been proposed and received high attention from researchers [1].From the perspective of "not limited by time and space", scholars have defined work connectivity behavior and proposed the concept of work connectivity behavior after-hours, which is dedicated to describing the behavior of individuals using communication devices to participate in work and workplace social interaction after-hours [2].Work connectivity behavior after-hours occurs frequently in teachers' life. Because of the special nature and content of teachers' work, they often use network communication tools to keep frequent and close communication with others, which focuses on school work, so that they have become accustomed to working connectivity behavior after-hours. According to the statistical research on China, 80% of teachers are in a sub-health state. Another survey of young teachers shows that more than 70% of teachers think their workload is overloaded or full, and nearly 20% of teachers are in a sub-health or sick state, which reflects that current teachers' work pressure cannot be underestimated and their health is not ideal. It is worth noting that teachers' emotional state not only determines achievements, but also affects students' learning states and their mental health. Therefore, we need to enunciate the seriousness of the problem and the urgency of solving it.COR theory points out that when individuals perceive that they have lost a lot of resources, are about to lose some resources, and it is difficult to obtain new resources in the future, they will gain pressure, which will lead to a series of negative effects. Therefore, once massive work connectivity behavior after-hours consumes teachers' energy excessively, and make them unable to get timely and adequate rest, teachers will easily become listless and less interested in their work, which may affect their job performance. At the same time, according to JDR model, high job demands will affect the results through the path of health damage. When job demands are too high and exceed teachers' tolerance, it may also further aggravate job burnout.

2. Research Design and Assumption

Sample. The study was conducted with a sample of teachers from 21 senior high schools in a municipality directly under the central government of China, and the questionnaire was administered to the sample at two time points using electronic questionnaires and subjects' self-assessment to reduce common method bias. Questionnaires containing control, independent, and moderating variables were

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administered at time point T1 (October 2022) and questionnaires including mediating and dependent variables were administered at time point T2 (November 2022). The questionnaires included four types of demographic information, namely, gender, age, years of work, and education, in addition to a maturation scale that measured the relevant constructs. A total of 630 questionnaires were distributed in the study, and after matching twice and deleting those that could not be matched and those with too short a response time, 542 valid questionnaires were obtained, with a valid return rate of 86%. The study was conducted in accordance with the statistical analysis and regulation. In terms of gender, male teachers accounted for 37% and female teachers accounted for 63%. In terms of age, 10% of the subjects were under 25 years old, 22% were 25-35 years old, 46% were 35-45 years old, 16% were 45-55 years old, and 6% were 55 years old or above. In terms of education, 3% were high school or below, 67% were bachelor's degree, and 30% were master's degree or above, which can be considered as the higher education level of the study sample. In terms of years of work, 14% of the respondents had worked for 5 years or less, 20% had worked for 5-10 years, 26% had worked for 10-20 years, 21% had worked for 20-25 years, and 19% had worked for more than 25 years. Therefore, the study sample basically conforms to the reality and meets the conditions for analysis.

Work connectivity behavior after-hours and job performance. In the current context of extremely advanced communication technologies, work connectivity behavior after-hours has gradually become the norm in many professions, and teachers are no exception, especially considering their work characteristics and features, so that work connectivity behavior after-hours can be seen as a job demand. According to JDR theory, job demands can negatively affect multiple organizational outcomes by triggering health impairment processes through the pathway of job burnout. For example, Hakanen et al. (2006) concluded after a study using a group of foreign teachers as a sample that job demands fully mediated teachers' health problems and organizational commitment through job burnout, leading to a significant increase in their health problems and a significant decrease in their level of organizational commitment [3]. Similarly, Schaufeli and Taris et al. (2011) found that job demands also fully mediated employees' propensity to leave and organizational commitment through burnout, leading to a significant increase in their propensity to leave and a significant decrease in organizational commitment [4]. As for how high job demands affect performance, Bakker et al. (2014) argues that high job demands negatively affect employees' job performance through the mediating effect of emotional exhaustion [5]. A study by Ye-jin Liu and Warm (2022) with a sample of teachers also found that job demands reduce teachers' teaching performance by inhibiting work engagement [6]. As mentioned earlier, the construct of job performance is jointly communicated by task performance and relational performance. On the one hand, when teachers engage in a high degree of work connectivity behavior after-hours, their own "energy resources" are continuously depleted after-hours. This behavior causes teachers to perceive a continuous decrease in their resources and triggers their instinct to maintain and preserve their resources. In order to maintain their resources, teachers may stop activities that consume a great deal of their resources, such as teaching and research, or they may reduce the resources they devote to them and stop preparing lessons as carefully as they used to, which can lead to a decrease in the quality of their teaching and in task performance. On the other hand, taking the initiative to help other colleagues and engaging in altruistic behavior also requires a great deal of energy, and teachers are much less likely to engage in this altruistic activity in order to maintain their own resources. In this way, teachers' relational performance is also negatively affected. Thus, high levels of work connectivity behavior after-hours not only affect the task performance of the teacher population and reduce their teaching quality, but also make them less likely to engage in organizational citizenship behaviors and harm their relational performance. Therefore, we propose hypothesis 1: Work connectivity behavior after-hours have a negative effect on both task performance and relational performance of teachers.

Mediation of job burnout. Bakker, Demerouti et al. (2005) concluded that workload, job emotional demands, physical demands, and work-family conflict are all risk factors for job burnout, meaning that high job demands positively affect job burnout, and higher job demands are associated with higher levels of job burnout [7]. The study found similar findings in a Chinese cultural context, proposing that after controlling for baseline levels, incremental job demands were significantly positively related to incremental job burnout. Whereas work connectivity behavior after-hours as a job demand has been empirically studied to demonstrate a positive relationship between it and job burnout. When teachers frequently need to discuss their students with parents through communication software, exchange work experiences with colleagues, or discuss school issues with leaders after work, their emotional resources are depleted step by step. Moreover, as the off-duty time that would otherwise be used to restore resources cannot be used to replenish them, the rate at which they lose resources is further accelerated, creating a whirlwind of resource loss in the long run. In addition, when the level of work connectivity behavior is high, teachers are forced to communicate with the same people repeatedly after work each

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day. Such communication over long periods of time can easily lead to a lack of freshness, reducing teachers' enthusiasm for communication and exchange, which makes it difficult for them to replenish their resources from freshness. The lack of resources can extinguish their initiative to care and love others, making them indifferent and apathetic to others and experiencing depersonalization. Finally, work connectivity behavior after-hours is also usually not the primary responsibility of the teaching profession, and is often very trivial, such as the special needs and opinions of students' parents, responding to supervisory inspections, participating in school construction, and so on. These do not give teachers a high sense of accomplishment compared to teaching, and they do not allow them to gain new resources from their accomplishment, resulting in a decline in accomplishment. In summary, when the degree of work connectivity behavior after-hours is high, teachers experience emotional exhaustion, depersonalization and low achievement. Therefore,we propose hypothesis 2: Work connectivity behavior after-hours positively affects job burnout.

High-demand work has a negative effect on employees' performance, but this effect is not direct, but rather mediated through emotional exhaustion [8]. As discussed earlier, when teachers frequently engage in work connectivity behavior after-hours, their emotional resources are depleted until they are exhausted, so that they may also experience depersonalization, indifference, lack of concern for others, and a significant decrease in job fulfillment. When teachers' emotional resources are progressively depleted until they are exhausted, it affects their task performance and job dedication. For teachers, teaching achievement is the most important task performance. When teachers' emotional resources cannot be effectively restored and replenished, it is difficult for teachers to complete their teaching tasks in a full, positive, and active emotional state, so task performance is likely to decline. Job dedication requires teachers' positive and active emotional resources to implement, so when teachers lack sufficient emotional resources, their job commitment also decreases. When teachers lose their motivation to care for and love others, the interpersonal facilitation dimension of their job performance suffers significantly. This is because interpersonal facilitation refers to helping colleagues who are struggling to do their jobs successfully, boosting team morale, and cooperative behaviors, among others. All of these actions require strong individual enthusiasm and caring resources in order to implement them. When teachers lack these energetic resources, they are unable to care for and love their students, as well as not actively and enthusiastically help other colleagues. When teachers' sense of accomplishment declines, their motivation and enthusiasm for their work decreases, and the affective resource of accomplishment becomes scarce. On the one hand, task performance requires love and enthusiasm for teaching itself, but a lack of a sense of accomplishment can reduce task performance. On the other hand, job dedication requires sufficient motivation, and a lack of accomplishment is insufficient to support this motivation, and then teachers' job dedication is negatively affected. Therefore, we propose hypothesis 3: Job burnout mediates the relationship between work connectivity behavior after-hours and job performance.

Moderation of role pressure. The most important role expectation society places on teachers is to teach and improve students. But many teachers lack access to resources and information related to meeting this role expectation, which can cause ambiguity. In addition, many teachers have to take on many trivial administrative tasks besides heavy teaching tasks, such as responding to inspections by superiors, holding various themed class meetings, writing materials, etc. This is not consistent with the main expectations assigned to them by society and schools, which triggers their role conflict. Furthermore, the teaching task is cruel so that it already requires a lot of resources and energy to accomplish it, but teachers are also burdened with many other expectations, which may be far more than teachers can handle, thus creating a situation of role overload. When teachers are engaged in a high level of work connectivity behavior after-hours, their emotional resources are heavily depleted and not replenished, so that job burnout levels increase. At this point, if teachers are still suffering from role overload, they feel that they cannot handle so many responsibilities and expectations, which leads to the idea that "even if I do it, I cannot meet the expectations and there is no point in doing it", further increasing the level of job burnout. Meanwhile, if teachers perceive role conflict, despite their deep responsibility to meet these expectations, work connectivity behavior after-hours makes it not only difficult to obtain resources to reconcile these expectations,but also feel deep powerlessness. If teachers are faced with the dilemma of not knowing how to meet diverse expectations, resulting in role ambiguity, the ambiguity as an uncertainty will also deplete their resources,so that job burnout will be further enhanced. Taken together, role stress can further entrench and intensify the vortex of resource loss triggered by work connectivity behavior after-hours, thereby substantially increasing their burnout. Therefore,we proposed hypothesis 4: Role stress plays a positive moderating role between work connectivity behavior after-hours and job burnout.

A significant relationship between role stress and job performance has been found. Jachson and

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Schuler (1985) suggests that it may be due to the lack of information, role ambiguity, information overload and role conflict that decreases performance levels. When teachers experience elevated levels of burnout as a result of implementing work connectivity behavior after-hours, role ambiguity further exacerbates the negative effects on performance by leaving them without sufficient information to effectively improve themselves [9]. Role conflict and role overload cause them to receive so much information that they have to consume extra resources to discern the truth, usefulness, and urgency of the information, which likewise continues to deepen the the negative impact on job performance. Based on the above analysis,we proposed hypothesis 5: Role stress positively influences the mediating effect of job burnout between work connectivity behavior after-hours and job performance.

In summary, the model intended to be studied in this paper is shown in Figure 1.

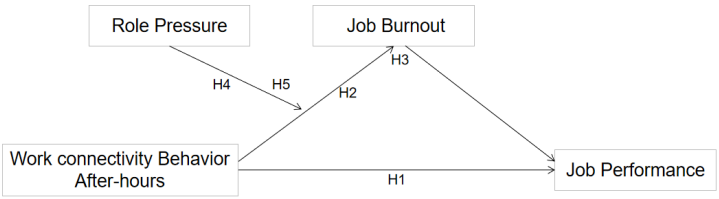

Figure 1: Research model

3. Result

Common method bias test. In order to minimize the common method bias, the study took various measures(as shown in Table 1). First, the scales used in the study have been widely used in the field with good reliability. Second, the reverse questions of the scales used in the study were retained. Third, the data collection was conducted in two time points, the first time point collecting the independent, moderating and control variables, while the second time point collecting the mediating and depend variables. Finally, questionnaires were used in both studies, and the necessary explanations were provided to the respondents before sending to them. In addition, the variables corresponding to the questions were not ever marked in the questionnaire to minimize the interference of the subjects. The study used Herman's one-way test for factor analysis, and a total of 47 entries were tested for four variables, and there were a total of 11 eigenvalues greater than 1. The variance explained by the first factor was 27.87% (less than 40%), cumulatively explaining 72.47% . From the above data, it can be concluded that there is no serious common method bias in this study, which can be further analyzed.

Table 1: CMV Test(Principal component analysis)

Component	Total	Percentage of Load	Cumulative Percentage
1	13.10	27.87	27.87
2	6.13	13.04	40.91
3	2.80	5.97	46.88
4	2.26	4.81	51.68
5	1.96	4.17	55.85
6	1.68	3.57	59.42
7	1.56	3.32	62.74
8	1.28	2.71	65.46
9	1.19	2.54	68.00
10	1.10	2.34	70.34
11	1.01	2.14	72.47

Table 2: Reliability Analysis

Variable	Cronbach's α	Items
Work Connectivity Behavior After-hours	0.84	3
Role Pressure	0.90	13
Job Burnout	0.86	15
Job Performance	0.92	16

Reliability Test. The Cronbach's coefficients of the four scales were examined in turn, which turned

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to be 0.84, 0.90, 0.86, and 0.92 (as shown in Table 2), all of which were greater than 0.8. Therefore, the scales of the study had good reliability and met the criteria for statistical analysis.

Validity test. In order to test that the results truly reflect what was intended to be measured, it was necessary to test the validity. In the first step, KMO and Bartlett's spherical tests were conducted, and 47 entries of the four scales were tested and found to have a final KMO value of 0.89 (>0.8) and a P-value of 0.0001 (<0.001) , which indicate a good correlation between the variables to proceed to the next factor analysis. The study conducted validated factor analysis on four variables (as shown in Table 3). Compared with the other three models, the four-factor model had the best fit with x^2/df of 1.57 (less than 3), *CFI*=0.92 (greater than 0.90), *TLI*=0.91 (greater than 0.90), and *RMSEA*=0.05 (less than 0.08), indicating that the discriminant validity among variables was good and could be analyzed subsequently.

Table 3: Confirmatory Factor Analysis

Model	x^2/df	*RMSEA*	*CFI*	*TLI*
Four factor model	1.57	0.05	0.92	0.91
Three factor model	1.95	0.07	0.86	0.85
Two factor model	2.62	0.09	0.76	0.75
Single factor model	5.21	0.14	0.38	0.35

Descriptive correlation analysis. Pearson's correlation analysis was conducted on four main variables, as well as demographic variables (as shown in Table 4). Gender, age, education, and years of working are not significantly related to work connectivity behavior after-hours, role stress, and job burnout, whereas only gender and age are significantly related to job performance, which will continue to be controlled in the study.

Table 4: The Result of Correlation Analysis

Variable	1	2	3	4	5	6	7	8
Gender	-							
Age	0.21*	-						
Education	0.01	-0.29**	-					
Years of Working	0.19**	0.88**	-0.38**	-				
Work Connectivity Behavior After-hours	0.07	-0.01	-0.01	0.03	-			
Role Pressure	0.07	0.01	-0.10	0.07	0.28**	-		
Job Burnout	0.10	-0.06	-0.06	-0.02	0.48**	0.77**	-	
Job Performance	-0.13*	0.14*	-0.03	0.12	-0.36**	-0.27**	-0.37**	-

* $p<0.05$， ** $p<0.01$.

Mediating effect test. To test the mediating effect of job burnout more accurately, the study used Hayes model 4 for Bootstrap sampling 5000 times (as shown in Table 5). The direct effect of work connectivity behavior after-hours on job performance (Effect=0.160, $p<0.01$, 95% confidence interval [-0.249, -0.070], excluding 0) proves hypothesis 1. The mediating effect of job burnout was also significant (effect=0.078, $p<0.01$) with 95% confidence interval [-0.130, -0.036], indicating that hypothesis 3 is valid and also that job burnout plays a partial mediating role.

Table 5: The Result of Mediation Effect

	Effect Size	SE	95% Confidence Interval	
			Minimum	Maximum
Direct Effect	0.160	0.045	-0.249	-0.070
Indirect Effect	0.078	0.024	-0.130	-0.036

Moderating effect test. In order to test the moderating effect more accurately, a Bootstrap was conducted using Hayes model 1 with a sample of 5000 times (as shown in Table 6). The indirect effect of work connectivity behavior after-hours on job burnout was significant with 95% confidence intervals of [0.053, 0.183], [0.156, 0.261], and [0.224, 0.374], which correspond to low, middle and high level of role pressure.

Table 6: The Test of Moderating Effect

Role Pressure	Indirect Effect	SE	95% Confidence Interval	
			Minimum	Maximum
Low	0.118	0.033	0.053	0.183
Middle	0.209	0.027	0.156	0.261
High	0.299	0.038	0.224	0.374

The result of moderating effect test is shown as Figure 2, which also proves hypothesis 4.

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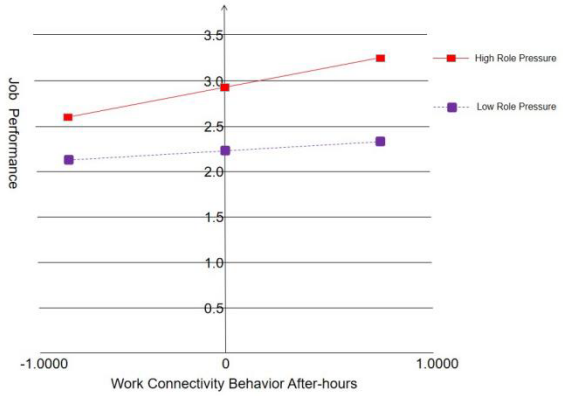

Figure 2: The Result of Moderating Effect Test

The moderated mediation test. The study used Hayes model 7 to conduct Bootstrap, sampling 5000 times, to test by putting all 4 variables and verify the moderating effect of role stress (as shown in Table 7).The data results showed that when the level of role stress is low, the indirect effect of work connectivity behavior after-hours on job performance is significant with 95% confidence interval [-0.054, -0.005] and the indirect effect value is -0.027. When the level of role stress is high, the indirect effect of work connectivity behavior after-hours on job performance is significant with 95% confidence interval [-0.112, -0.032] and the indirect effect value is -0.020. The result suggests that the higher the level of role stress is, the greater the effect of work connectivity behavior after-hours on job performance through the mediating effect of job burnout is. Therefore hypothesis 5 is supported.

Table 7: The Test of Moderated Mediation

Role Pressure	Indirect Effect	SE	95% Confidence Interval	
			Minimum	Maximum
Low	-0.027	0.013	-0.054	-0.005
Middle	-0.052	0.015	-0.085	-0.023
High	-0.069	-0.020	-0.112	-0.032

4. Discussion

Work connectivity behavior after-hours and job performance. Using a sample of teachers, the study found empirically that work connectivity behavior after-hours can have a negative effect on job performance, which is similar to the research which demonstrated that cramming after-hours negatively affects Internet employees' job performance based on self-loss theory. Non-work time is supposed to be used for teachers to recover and preserve their resources, but when they work on work-related tasks during non-work time, they feel a significant loss of their resources, which leads to feelings of stress. COR theory suggests that individuals instinctively seek to protect their resources. As a result, feelings of stress force them to take action to preserve their resources. The work itself is resource-intensive, and in order to further stop the loss of resources, they may reduce the amount of resources they invest in their work, thus causing a decline in job performance.

Mediation. The study demonstrates that work connectivity behavior after-hours positively affects job burnout, while job burnout negatively affects job performance, which is in line with existing findings. This finding suggests that when teachers engage in work connectivity behavior after-hours, their level of job burnout increases, which causes a decrease in job performance. Job burnout is an important factor in individual resource attrition. When teachers engaged in work connectivity behavior after-hours, their emotional resources were further depleted, which could easily lead to emotional exhaustion. Because this behavior had little relationship with their main job, it was also difficult to obtain a sense of accomplishment, causing a decrease in achievement. In addition, because the work-linked behavior was directed to the same group of people for a long time, teachers could also easily extinguish their enthusiasm for work and develop a depersonalization mentality, so the level of burnout increases significantly. As the level of burnout increases, the feeling of stress also arises. In order to handle with the loss of resources, teachers have to reduce the resources invested in their main job, which may result in a decrease in the quality of their teaching and thus their own job performance.

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Moderation. There is currently no research which examines the relationship between job demands and job performance. The reason for including role stress as a moderating variable in this paper is also to respond to Bakker et al.'s (2016) review of the literature more than 20 years since the introduction of the JDR theory [10]. The buffering effect of job resources on job demands has been demonstrated by a large number of empirical studies, but there is a lack of research to discuss the role between job demands, or between job resources. Therefore, the research also builds on this call to explore the role between two types of work demands: role stress and work connectivity behavior after-hours.

5. Conclusion

Based on COR theory and JDR model, the study has investigated the effect of work connectivity behavior on job performance through the mediating role of job burnout in a group of teachers, and introduced role stress as a job demand as a moderating variable. After the empirical research analysis, we can draw the following conclusions: ①Work connectivity behavior after-hours has a negative impact on work performance; ② Work connectivity behavior after-hours has a positive effect on job burnout; ③ Job burnout partially mediates the relationship between work connectivity behavior after-hours and job performance; ④ Role pressure positively moderates the effect of work connectivity behavior after-hours on job performance through job burnout.

Limitations and future directions. First, all variables were evaluated by self-reports. Although the data in this study did not suffer from serious common method bias, it may inevitably embellished and exaggerated their own situations. Therefore, job performance evaluations by leaders could be added, thus effectively controlling for bias. Second, the study demonstrated role stress as the moderation, but the significance of the moderating effect was found to be low and not intuitive compared with the mediating and main effects. Future researches could further examine other moderating variables.

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