



Double-Edged Sword Effects of Work Connectivity Behavior After-Hours (WCBA) on Work-Family Balance

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Abstract. This research tested the influence of work connectivity behavior after-hours (WCBA) on work-family balance. Work-related rumination, including affective rumination and problem-solving pondering, was considered the mediation to study the mechanism of such influence. Furthermore, boundary segmentation preference was introduced as a moderator to explore the double-edged sword effects of WCBA on work-family balance. We collected 393 valid questionnaires in two periods and reached the following conclusions: (1) WCBA negatively predicts work-family balance; (2) WCBA positively predicts affective rumination which negatively predicts work-family balance and positively predicts problem-solving pondering which positively predicts work-family pondering; (3) both the effect of WCBA on work-family balance and the indirect effect of WCBA through work-related rumination on work-family balance are moderated by boundary segmentation preferences, which are both attenuated when boundary segmentation preference is higher. We discussed the conclusion of this research and drew theoretical and practical inspirations.

Keywords: work connectivity behavior after-hours (WCBA) · work-family balance · affective rumination · problem-solving pondering · boundary segmentation preference

1 Introduction

With the increased popularization of the Internet and the continuous maturity of information technology, more and more employees use mobile communication devices, such as smartphones, to engage in work affairs outside working hours [1]. Since the breakout of Covid-19, various mobile applications (e.g., ZOOM, Ding Talk) have been continuously developed to ensure that employees can work outside [2]. This new form of work is no longer limited by office location and time, allowing employees to work anytime and anywhere (e.g., replying to e-mails during commute time, and handling temporary tasks assigned by leaders at home on weekends) [3]. Such working behavior of using mobile communication devices to stay connected to work during non-working hours is defined as work connectivity behavior after-hours (WCBA) [4].

WBCA makes the boundary between employees' work and life gradually disappear [3]. Family and work are important areas for employees who are actively seeking a balance between the two. In the state of work-family balance, the responsibilities of each role are well accomplished and performed efficiently [5]. Researchers have extensively studied the impact of WCBA on work-family balance and have developed different perspectives. Positive scholars pointed out that WCBA improves employees' flexibility and a sense of control over work by removing time and space constraints [6, 7]. Such positive emotions in the workplace will extend to the family field, which is conducive to the improvement of family happiness. In contrast, negative scholars believe that WCBA urges employees to deal with work-related matters in the family on time, which will consume the resources that the employees would otherwise invest in the family, and as a result, will interrupt normal family life and more easily lead to work-family conflicts [8]. The impact of WCBA on work-family balance has not reached an agreement. Therefore, as the focus of this research, we hope to sort out the previous studies to clarify that how WCBA affects work-family balance positively or negatively.

To integrate the positive and negative effects of WCBA, we draw on the conservation of resource theory to explore the possible double-edged sword effects of WCBA and further explore its influence on work-family balance [9]. As a result of WCBA, employees may be required to work or consider work at any time or location [4], which indicates that work-related rumination is a potentially important mechanism by which WCBA affects work-family balance. Work-related rumination is defined as employees consciously and repeatedly thinking about work and generating positive thoughts or negative emotions, usually during non-working time [10]. Work-related rumination includes two dimensions: affective rumination and problem-solving pondering [11]. Affective rumination denotes a negative cognitive condition in which individuals consciously and repeatedly recall negative work experiences. Problem-solving pondering is an assessment of a completed assignment to accept how to improve, predict problems from new perspectives, and put advanced avant-garde ideas [12]. We argue that WCBA, on the one hand, can enhance employees' sense of control over work [6], help them think positively about work, and generate positive emotions [13], which is good for work-family balance. On the other hand, WCBA requires employees to work anytime and anywhere [14], which is a high job requirement that consumes personal resources, produces negative affective rumination, and is harmful to work-family balance.

Third, based on the work/family border theory [15], we propose boundary segmentation preference as a potential moderator. The theory states that to effectively distinguish the work-family fields, employees consciously establish a boundary between the two fields, and employees have a boundary segmentation preference [16], which determines whether employees are willing to place their personal and professional lives together or to keep the two separated. Segmenters tend to keep work and home as separate as possible to maintain emotional, attitudinal, and behavioral separation between work and family [17]. In contrast, integrators prefer to ignore boundaries related to work and family, while playing multiple roles in different fields [18]. WCBA blurs the line between work and family. Segmenters want their life to be independent of work [19], so for such individuals, the negative/positive emotions or outcomes of work-related rumination will be limited to the work area and will not further affect the family, while integrators play

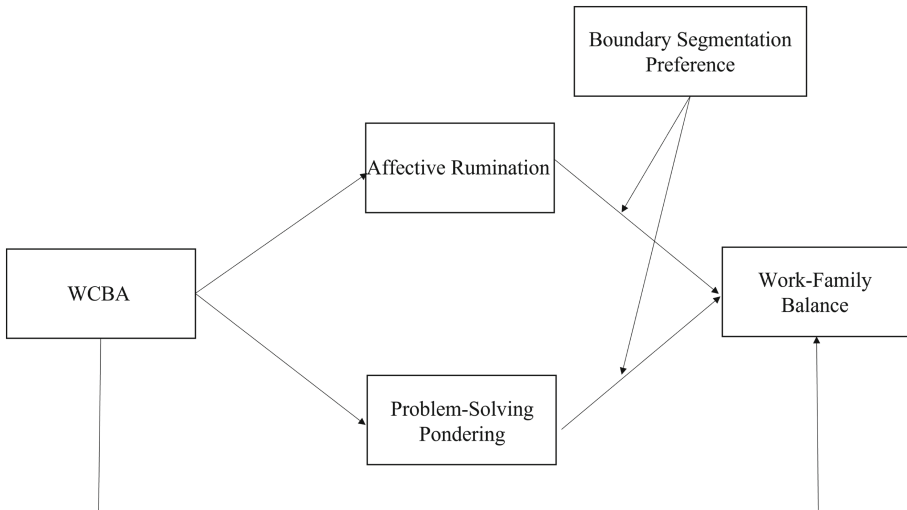


Fig. 1. The hypothesized model (Self-drawing).

multiple roles in different fields simultaneously. They may still have work roles in the family. The positive/negative emotions from work rumination are difficult to isolate from the family, and the work emotions are more likely to affect work-family balance [20]. To sum up, based on the conservation of resource theory and the work/family border theory, we propose the double-edged sword effects of WCBA on work-family balance. Figure 1 depicts the theoretical model.

2 Literature Review and Hypothesis

WCBA is a new way of working, spawned by the development of mobile technology. It was first discussed in the 20th century and originated from the application of computer network technology to work [3]. Richardson & Benbunan-Fich defined WCBA as the behavior of employees using mobile communication devices to stay connected to work across time and space outside normal working hours (e.g., before work, after work, weekends and holidays), such as checking emails on the commute, working at home on weekends, dealing with work during lunch break, etc. [4]. WCBA has the following five characteristics [21]: (1) WCBA usually occurs outside working hours; (2) WCBA usually occurs outside the workplace; (3) employees deal with work-related affairs; (4) WCBA occurs with the help of mobile communication devices (such as mobile phones and computers); (5) WCBA is a supplement to work. Considering the concept and characteristics of WCBA, on the one hand, WCBA enables employees to independently arrange a time to complete tasks without time and space constraints, which is conducive to the advancement of work goals and improves their performance [7]. Meanwhile, WCBA improves employees' work flexibility [22], promotes the flow of resources between different fields [23], and enhances the communication and interaction between employees and leaders and colleagues [24]. It can help employees access resources (such as information) related

to work tasks. In addition, a positive work experience helps employees achieve a good work-family balance. WCBA, on the other hand, is essentially an additional job requirement that requires employees to be connected to work anytime and anywhere, keeping employees on call at all times [4]. In this state, the boundary between employees' work and family life becomes blurred, leading to the penetration of work into the family field. Excessive job demands can also affect employees' work-family balance [25].

Because of WCBA, employees find it difficult to take breaks during non-working hours [21], which makes them think about work-related issues (e.g., recalling meeting topics in their spare time) and affects the employees' mood. This behavior of individuals consciously thinking and generating positive or negative work-related thoughts during non-working time is defined as work-related rumination [10]. It is divided into affective rumination and problem-solving pondering. Emotional ruminating is employees' negative cognition of negative work experience, resulting in negative emotions such as irritability and boredom [11]; problem-solving meditation aims to think about work tasks and actively look for ways to improve work, and the completion of work tasks will bring positive emotional experience to employees [26]. Although no research has confirmed the relationship between work-related rumination and work-family balance, the existing research has confirmed that work ruminating has a significant impact on employees' well-being at work and in life [26, 27]. It helps us consider whether the two aspects of work-related rumination, i.e., affective rumination and problem-solving pondering, affect employees' work-family balance.

Drawing on conservation of resource theory, we argue that WCBA may reduce the work-family balance. According to conservation of resource theory, employees are more willing to acquire and retain their resources to meet their basic needs at work, including two important inferences: "resource loss spirals" and "resource gain spirals" [9]. "Resource loss spiral" means that the initial resource loss will lead to further resource loss, and the development of the resource loss spiral will be faster, and the negative response will be more intense. "Resource gain spiral" means that the initial resources are beneficial to the further acquisition of resources, but the development of the resource acquisition spiral is relatively slow. Although WCBA can provide employees with work resources and trigger a "resource gain spiral", its essence is still job requirements, which will consume employees' resources and lead to "resource loss spirals". Based on the principle of "primacy of loss" [28], the impact of resource loss is far greater than the impact of resource gaining. Thereby, it is believed that WCBA will harm the work-family balance. Specifically, as a high-demand job, WCBA will make employees engage in affective rumination and gain negative emotional experience, thereby accelerating resource consumption and breaking the work-family balance. As a work resource, it engages employees in contemplative problem-solving, which helps employees regain resources, generate positive emotional experiences, and reduce the negative impact on work-family balance.

2.1 WCBA and Work-Family Balance

WCBA refers to the behavior of employees using mobile communication devices to stay connected to work during non-work hours (Richardson & Benbunan-Fich, 2011) [4]. Work-family balance is defined as individuals fulfilling expectations for work-family

roles in the work-family field and fulfilling the corresponding responsibilities of each role [5]. With a good work-family balance, the responsibilities of each role are well accomplished and efficiently performed. Based on the resource conservation theory [9], this research argues that WCBA has two effects on work-family balance.

First, the resource scarcity theory argues that the participation of individual roles consumes limited personal resources such as time, energy, and attention [29]. In addition, the occupation of resources by one role will lead to a reduction in the available resources for other roles [30]. WCBA is a behavior in which work invades the family and overuses personal resources. When the limited resources are used up too much by work, the resources that can be used to support the family will be tilted towards the work field, making it difficult to meet the needs of the family. This has implications for the degree to which work-family balance is maintained [31]. From the perspective of role change, it is pointed out that WCBA will make employees frequently change roles between work and family, make it difficult for employees to coordinate among multiple roles, and hinder the completion of family obligations. The employees' satisfaction degree of work-family balance is also reduced [14].

Second, from the perspective of "work resources", WCBA, as a way of obtaining resources, can help employees to control work affairs anytime and anywhere, improve work efficiency and flexibility, and then infiltrate positive emotions into the family [32]. It helps employees to integrate work-family resources and positively influences the individual perception of work-family balance [33]. Although WCBA seems to have the above positive effects, based on the principle of "primacy of loss" of the resource conservation theory, the negative effects caused by WCBA as a job requirement will outweigh the positive effects of work resources. In summary, we propose the following hypothesis:

Hypothesis 1: WCBA negatively affects work-family balance.

2.2 The Mediation Effect of Work-Related Rumination

Because of WCBA, the lines between home and work are blurring. It is challenging for workers to divert their attention from the workplace during non-work hours [11]. Employees may have negative emotional reactions due to negative work experiences, causing affective rumination. It is also possible to actively think about work problems, seeking solutions and innovative ideas, which leads to problem-solving pondering [26].

According to the resource conservation theory [9], WCBA will not only cause a "resource gain spiral", but also a "resource loss spiral". Therefore, WCBA, as work resources and job requirements, will bring different work-related ruminations to employees. On the one hand, employees still need to think about work during non-working hours, which consumes individual resources and leads to negative affective rumination [31]. On the other hand, WCBA is beneficial for employees to access additional work resources [23], improve their sense of work control [6], and meet their psychological needs. In addition, it helps them to have work autonomy and positive perceptions of work-related issues during non-working hours, triggering problem-solving pondering. Rumination has a positive effect in this context. We make the following hypothesis:

Hypothesis 2a: WCBA positively affects affective rumination.

Hypothesis 2b: WCBA positively affects problem-solving pondering.

When WCBA occurs, employees should think about work consciously and repeatedly, producing positive or negative thoughts about work [10], resulting in work-related rumination. Work-related rumination mainly occurs in the family field, which occupies employees' resources used for the family [27]. When employees are informed to work during non-working hours, they will consciously enter a state of rumination at work, and their experience with employees at work can affect the family field. Specific to this research, WCBA induces work-related rumination, which in turn affects work-family balance. Employees seek work-family balance through mutual restriction, transformation, compensation, feedback, and adjustment [25].

First, WCBA essentially improves the work requirements of employees, so that employees have a load response. Continuous WCBA drains plenty of personal resources and energy, which leads to affective rumination, a poor cognitive state that focuses on unpleasant emotional experiences from previous work experiences [12]. When employees experience affective rumination, they tend to have irritability and anxiety due to negative work experiences, hindering employees' recovery from work and leading to a decrease in work-family balance.

Second, WCBA provides an effective way for employees to obtain more work resources [32], provides employees with job help and support, triggers incentive mechanisms, and promotes individuals to achieve work goals. Adequate work resources and motivation prompt employees to meditate on problem-solving pondering, thinking positively about work, producing positive emotional experiences and rewards, reducing work fatigue, and improving happiness [26]. Such positive work experiences help influence the family and promote employee participation in the family area. For example, a pleasant work experience enables employees to become happy fathers [34]. Considering the above arguments, we believe that WCBA induces affective rumination in employees, which is detrimental to work-family balance and problem-solving pondering, which is conducive to work-family balance.

Hypothesis 3a: Affective rumination mediates the relationship between WCBA and work-family balance.

Hypothesis 3b: Problem-solving pondering mediates the relationship between WCBA and work-family balance.

2.3 The Moderating Effect of Leader Performance

According to the work/family boundary theory [15], work and family are two separate fields with boundaries. Employees need to cross daily to meet their needs. Employees manage roles in different areas of work and family by establishing and maintaining the certain boundary. Through different management strategies, they help themselves successfully fulfill the corresponding role requirements [16]. The theory also states that individuals have different preferences for work-family boundary management [18]. The transformation of work-family resources will be affected by the work-family boundary. Due to the different preferences of work-family boundary management, employees' preferences for boundary segmentation are different. Kreiner defined boundary segmentation preference as whether employees wish to integrate work roles and family roles or maintain the degree of separation between them [17]. Employees with a strong preference for boundary segmentation will set a boundary between work and family and do

not want work exchanges to penetrate the family. Individuals with a weak preference for boundary segmentation tend to integrate work-family resources and blur work-family boundaries [16]. How individuals coordinate the scope and intensity of work-family boundaries plays a decisive role in work-family balance [15].

Specific to this study, work-related rumination triggered by WCBA causes employees to experience different emotional experiences. Affective rumination causes irritability and boredom, while problem-solving pondering can lead to pride and happiness [26], both of which tend to permeate from work into the family field, resulting in different impacts on work-family balance. Segmenters can effectively reduce the detrimental effects of emotional experience on the family field [19]. Meanwhile, they also hinder the positive spillover from the work field to the family field, because they believe that the positive emotions brought by work are only related to work, not family [35]. In contrast, integrators are more likely to be affected by work emotions in the family field, bring work emotions into the family, and strengthen the impact of work experience on work-family balance [20]. Based on the above arguments, we propose the following hypothesis.

Hypothesis 4a: Boundary segmentation preference moderates the relationship between affective rumination and work-family balance, such that this negative relationship is stronger when boundary segmentation preference is high;

Hypothesis 4b: Boundary segmentation preference moderates the relationship between problem-solving pondering and work-family balance, such that this positive relationship weakens when boundary segmentation preference is high.

Combining hypotheses 3 and 4, we propose a moderated mediation model. When employees have a high boundary segmentation preference, they tend to exclude the impact of work-related rumination caused by WCBA from the family field.

Hypothesis 5a: Boundary segmentation preference mediates the indirect effect of WCBA on work-family balance through affective rumination. When the boundary segmentation preference is higher, the indirect effect is weaker.

Hypothesis 5b: Boundary segmentation preference moderates the indirect effect of WCBA on work-family balance through problem-solving pondering. When the boundary segmentation preference is higher, the indirect effect is weaker.

3 Materials and Methods

3.1 Participants and Procedure

We recruited subjects in social software and major job search forums. We also entrusted them to help expand the people around them to fill out electronic questionnaires. To avoid common method bias to the largest extent, the questionnaires were distributed over different periods. There was two weeks interval between the first and the second round of questionnaires. The first round of questionnaires measured demographic information, WCBA, and work rumination. Participants who completed the first round of questionnaires were retained through the channel to facilitate the distribution of the second round of questionnaires two weeks later, which was then to fill in work-family balance and boundary segmentation preferences. Finally, the first and second rounds of questionnaires were matched according to the last four digits of the mobile phone number.

A total of 515 groups of questionnaires were distributed, excluding the invalid ones such as repeated answers and abnormal data. After the paired screening, there were 393 valid questionnaires (the first round plus the second round was considered as a group). The effective recovery rate was 76.3%. Demographic data showed that there were 188 males, accounting for 47.8%, and 205 females, accounting for 52.2%. In terms of age, it is mainly concentrated in the 31–40 age group, accounting for 35.90%. In terms of working years, it is mainly concentrated in more than 5 years, accounting for 60.80%. The education level is mainly concentrated at the college level and the undergraduate level, accounting for 39.20% and 39.40%, respectively. In terms of jobs, it is mainly concentrated among grass-roots employees, accounting for 70%.

3.2 Measures

We translated all English scales into Chinese according to translation and back-translation procedures. Unless otherwise stated, all measurements were graded using a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

WCBA. WCBA was measured on the scale developed by Richardson and Thompson [7], which includes frequency and time dimensions. Concerning the research of Wu and Ma [36, 37], some entries were revised to make them more in line with China's condition. A total of 9 situational items measures frequency. For example, corresponding to "I need to use my mobile device to work frequency", a Likert score of 1 to 5 denotes "never" to "very frequent". The three situational items of "lunch break", "after working time", and "holidays" measure the length of time, and a Likert score of 1 to 5 denotes "1–15 min", "16–30 min", "31–60 min", "1–2 h" and "more than 2 h", respectively. The Cronbach's α for this scale is 0.916.

Work-Related Rumination. Work-related rumination was measured in the work-related rumination questionnaire designed by Cropley et al. of the 10 items [11], five belonged to the affective rumination dimension (Cronbach's $\alpha = 0.916$), such as "I get nervous when I think about work-related questions in free time". The other 5 belonged to the problem-solving pondering dimension (Cronbach's $\alpha = 0.920$), such as "After work, I tend to think about how to improve job performance."

Work-Family Balance. We used a scale developed and amended by Lin et al. with 17 items [25], such as "Work takes up too much family time, leading to a certain sense of conflict, which makes me want to change this state." The Cronbach's α of the scale is 0.911.

Boundary Segmentation Preference. We used the boundary segmentation preference scale developed by Kreine [17], consisting of four items, such as "I tend to leave work things in the workplace". The Cronbach's α of the scale is 0.952.

Control Variables. We controlled the effects of gender, age, and education, which previous studies have demonstrated may have an impact on family-work balance [38].

4 Results

4.1 Preliminary Analysis

To examine the common method deviation for five study variables measured, we used the Harman single factor test and the results are as follows: the cumulative variance explanation rate of the five factors is 64.48%, and the variance explanation rate of the first main factor is 30.024%, which is less than half of the cumulative total variance (68.003%). It is demonstrable that this study’s deviation from the common method is not significant. In addition, we used AMOSS24.0 to conduct confirmatory factor analysis on WCBA, affective rumination, problem-solving pondering, work-family balance and boundary segmentation preference to examine the discriminant validity of each variable. The outcomes demonstrated favourable fit indices for the hypothesized model: $\chi^2/df = 2.009$, CFI = 0.928, TLI = 0.924, RMSEA = 0.051. Compared with other factor models, the fitting index of the 5-factor model is the best, indicating that the differential validity of the scale is good.

The mean, standard deviation, and correlation coefficient for each variable are displayed in Table 1. WCBA and work-family balance had a negative correlation ($r = .432, p.01$), which provides preliminary evidence for Hypothesis 1. WCBA showed a positive correlation with affective ruminating ($r = .387, p.01$) and problem-solving pondering ($r = .346, p.01$), which provides preliminary evidence for Hypothesis 2a and 2b. Additionally, there was a negative correlation between affective rumination and work-family balance ($r = .287, p < .01$), and a positive correlation between problem-solving pondering and work-family balance ($r = .142, p < .01$).

Table 2 presented the unstandardized path modeling results. As shown in M3, WCBA had a significant negative effect on work-family balance($B = -.336, p < .01$), supporting Hypothesis1. As shown in M1 and M2, WCBA a had significant positive effect on affective rumination ($B = .413, p < .01$) and problem-solving pondering ($B = .384,$

Table 1. Descriptive statistics and correlations among study variables (Self-drawing).

Variable name	Mean	SD	1	2	3	4	5	6	7	8
1. Age	1.522	.500	–							
2. Gender	3.430	1.057	–.141**	–						
3. Education	2.601	.818	.112*	–.273**	–					
4. WCBA	3.103	.869	–.076	.219**	–.056	(.916)				
5. Affective rumination	2.956	.969	–.041	.164**	–.038	.387**	(.916)			
6. Problem-solving pondering	3.262	.947	–.033	.003	–.023	.346**	.362**	(.920)		
7. Work-Family balance	3.033	.704	.041	–.193**	.055	–.432**	–.287**	.142**	(.911)	
8. Boundary segmentation preference	3.379	1.096	–.017	–.190**	.150**	.018	.189**	–.003	–.162**	(.952)

N = 393. *p < 0.05; **p < 0.01.

Table 2. Unstandardized path modeling results (Self-drawing).

Variables	Affective rumination	Problem-solving pondering	Work-family balance			
	M1	M2	M3	M4	M5	M6
Intercept	1.228**(.354)	2.333** (.354)	4.393(.251)	3.930** (.243)	5.066(.371)	2.783(.444)
Control variables						
Gender	.005(.092)	-.023(.092)	-.012(.065)	-.004(.059)	.004(.068)	-.007(.069)
Age	.013(.007)	-.006(.007)	-.010*(.005)	-.006(.004)	-.015*(.005)	-.017*(.005)
Education	.010(.057)	-.015(.057)	.005(.041)	.011(.037)	.023(.042)	.034(.043)
Independent variables						
WCBA	.413** (.053)	.384** (.053)	-.336** (.038)	-.375** (.038)		
Mediator						
Affective rumination				-.173** (.034)	-.465** (.098)	
Problem-solving pondering				.290** (.034)		.347** (.102)
Boundary segmentation preference					-.338** (.083)	.113(.100)
Int_1					.088** (.027)	
Int_2						-.071* (.029)
R ²	.159	.121	.197	.336	.142	.104
F	18.316**	13.398**	23.831**	32.482**	10.648**	7.445**

N = 67 teams. *p < 0.05; **p < 0.01. Int_1: Affective rumination x Boundary segmentation preference; Int_2: Problem-solving pondering x Boundary segmentation preference.

p < .01). The hypothesis of 2a and 2b was verified. Furthermore, as shown by M4, work-family balance was significantly impacted negatively by affective ruminating (B = -.173, p.01), whereas it was significantly impacted favourably by problem-solving pondering (B = .290, p.01). In order to test the existence of a parallel mediating effect, we used Process3.5 to test the indirect effects under 95%CI. The results show that the indirect effect of WCBA on work-family balance through affective ruminating was -.071, 95% CI = [-.112, -.039]. The indirect effect of WCBA on work-family balance through problem-solving pondering was .111, 95% CI = [.069, .161], supporting Hypothesis 3a, 3b.

Hypothesis 4 predicted the moderating effect of boundary management preference between work-related rumination (affective rumination and problem-solving pondering) and work-family balance, that was, employees with high boundary segmentation preference had less influence of work-related rumination on work-family balance. As shown in M5, the interaction between affective rumination and boundary segmentation preferences had a significant impact on work-family balance (B = .088, p < .01), and the interaction pattern is plotted in Fig. 2. As shown in M6, the interaction between problem-solving pondering and boundary segmentation preferences had a significant impact on work-family balance (B = -.071, p < .05), and the interaction pattern is plotted in Fig. 3. Taken together, these findings above supported Hypothesis 4a, 4b.

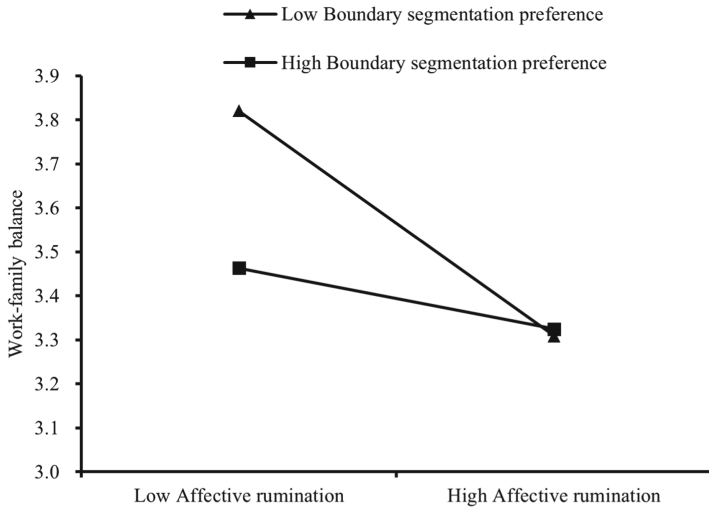


Fig. 2. The interaction effect between affective rumination and boundary segmentation preference on work-family balance (Self-drawing).

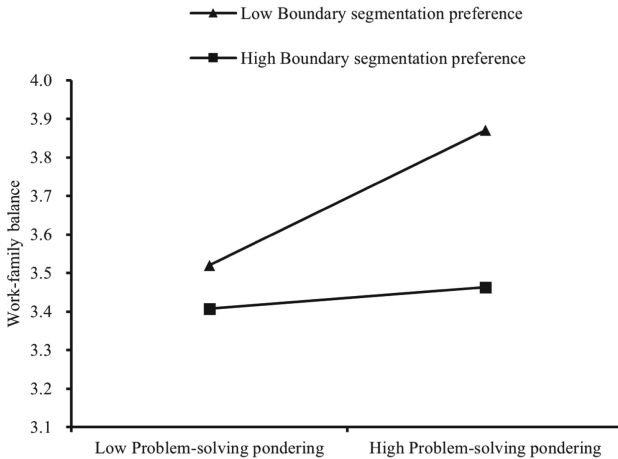


Fig. 3. The interaction effect between problem-solving pondering and boundary segmentation preference on work-family balance (Self-drawing).

In order to test the moderated mediation hypothesis, we tested the indirect effect of WCBA on work-family balance through work-related rumination (emotional ruminating and problem-solving meditation) in the context of high-level boundary segmentation preference and low-level boundary segmentation preference. The results showed that when the boundary segmentation preference was high (+1SD), the indirect effect of WCBA on work-family balance through affective rumination was not significant (indirect effect = $-.011$, 95% CI = $[-.049, .028]$). When the boundary segmentation preference was low ($-1SD$), the indirect effect of WCBA on work-family balance through affective

ruminating was significant (indirect effect = $-.093$, 95%CI = $[-.141, -.052]$). The difference between the two was significant (difference value = $.823$, 95% CI = $[.037, .137]$), assuming that H5a was supported. In addition, when the boundary segmentation preference is high (+1SD), the indirect effect of WCBA on work-family balance through problem-solving pondering was significant (indirect effect = $.066$, 95% CI = $[.023, .119]$). When the boundary segmentation preference was low (-1SD), the indirect effect of WCBA on work-family balance through problem-solving pondering was significant (indirect effect = $.131$, 95% CI = $[.082, .185]$). There was a significant difference between the two (difference value = $-.065$, 95% CI = $[-.123, -.013]$). It was assumed that H5b was supported.

5 Discussion

This study validates earlier research on the influence of WCBA on work-family relationships by focusing on its specific impact on work-family balance [8]. Our research shows that, based on the conservation of resource theory [9], WCBA induces a “resource loss spiral” and “resource gain spiral”, but the “resource loss spiral” is stronger, causing WCBA to have a negative impact on work-family balance.

Second, we further explore the internal mechanism by which WCBA affects employees' work-family balance. Most previous studies have explored the positive or negative effects of WCBA from a single perspective [6]. This study shows that WCBA produces different rumination, that is, employees view WCBA as a work resource, which helps to obtain more work resources, generate problem-solving pondering, discover work-related problems, gain positive emotional experience, and pass it on to the family, thereby increasing work-family balance. When employees regard WCBA as a job requirement, responding to work at any time will generate affective rumination, gain negative emotional experience and spill over to the family field. It will therefore affect work-family balance. In addition, the study suggests that employees do not simply engage in affective rumination or problem-solving pondering, both of which may play a mediation role in the impact of WCBA on work-family balance.

Third, based on work/family boundary theory, we constructed a moderated parallel mediation model with boundary segmentation preference as the moderating variable. We discussed the moderating effect of boundary segmentation preference in the process of work-related rumination (affective rumination and problem-solving pondering) and work-family balance. Individuals with a strong preference for boundary segmentation tend to establish a clear boundary between work and family. It proves that boundary segmentation preference attenuates the negative effect of affective ruminating on work-family balance. Meanwhile, it also weakens the effect of problem-solving meditation on work-family balance.

Finally, this research enriches and promotes conservation of resource theory while applying them. Previous studies have verified the double-edged sword effects of WCBA from the job demands-resources (JD-R) model [39], but the dual-path effect of JD-R does not clarify whether WCBA has a positive or negative impact on work-family balance. Using the “resource loss spiral” and “resource gain spiral” as well as the principle of “loss first” of the conservation of resource theory, this research provides a new theoretical

perspective on the double-edged sword effects of WCBA on work-family balance and enriches the application and development of conservation of resource theory.

5.1 Practical Implications

This research validates that work-related rumination is an important mechanism by which WCBA affects work-family balance. WCBA will cause employees to recognize and think about work in non-work areas. Managers should recognize the positive potency of problem-solving pondering, provide effective management measures, guide employees to think about work effectively after work, and help employees benefit from problem-solving pondering. Meanwhile, managers should pay attention to the negative impact of affective rumination on employees and avoid the negative impact of WCBA. Enterprises can avoid unnecessary WCBA by establishing a reasonable system. On the one hand, enterprises should reasonably design the workflow, fully consider the actual ability of employees in workflow design, ensure that employees can complete the workflow and tasks in the workplace, avoid WCBA caused by high work requirements, and reduce the extra workload of employees. On the other hand, making corresponding regulations on the frequency, duration, content, and mode of WCBA, and establishing an incentive mechanism to achieve the psychological expectations of employees, effectively guide employees to carry out problem-solving pondering, and reduce the adverse effects of WCBA on work-family balance through affective rumination. In addition, employees can establish a reasonable work-family boundary management strategy based on a correct understanding of WCBA. Employees can take the initiative to communicate with leaders and coordinate appropriate work forms according to their needs. Finally, employees can adjust the boundary elasticity between work and family appropriately.

5.2 Limitations and Future Research

There are several potential limitations of this study worth considering. First, this study has certain limitations in data collection. The subject sources of this study are relatively scattered. Now WCBA is more likely to occur in Internet companies, and it is more inclusive of new technologies. Meanwhile, employees are younger and have a more positive attitude towards WCBA. Considering these, the follow-up study shall pay more attention to the impact of WCBA on employees in such companies. In addition, the variable scales involved in the questionnaire were all self-reported, meaning that the subjects may fill in the direction according to the expectations of society and their own. In the future, questionnaires can be distributed in pairs (in the form of employees and spouses, etc.) to improve the accuracy of questionnaire data.

Second, the study found that for individuals, affective rumination and problem-solving pondering exist simultaneously. The two kinds of rumination may show a stronger and weaker state. It is also possible that the interaction of the two kinds of ruminants affects the employees' work life simultaneously [12]. However, this study only provides a preliminary verification of the above point of view and lacks meticulous data. Therefore, future research can take experiments, longitudinal studies, etc. to further verify whether affective rumination and problem-solving pondering can affect

work-family balance at the same time and whether or not there is a mutually restrictive relationship between the two.

Finally, most of the current studies on WCBA focus on the field of work-family relationships, and this study also follows this. Future research can focus on emotional mechanism and cognitive mechanism to explore the impact of WCBA on individual specific behaviors, especially extra role behaviors such as OCB, voice behavior, knowledge sharing, and so on. In addition, due to the development of information technology, WCBA is likely to be a long-standing organizational phenomenon. Whether it will form an atmosphere in the organization or team and affect the overall performance of the team is worthy of future research. At the same time, on the basis of a clear understanding of the mechanisms of WCBA, more consideration should be given to how employees view and deal with WCBA, and whether the organization will provide corresponding resources to help employees cope with WCBA. Therefore, future research can use new theories, like transactional theory of stress, to explore employees' attitudes towards WCBA and the impact of organizational environmental factors on employees' attitudes, so as to clarify the boundaries of WCBA.

6 Conclusion

Our research integrated the positive and negative effects of WCBA on work and family of previous researches, and constructed and verified the double-edged sword effects of WCBA based on the conservation of resource theory. We finally confirmed that WCBA had a negative impact on work-family balance, but the two dimensions of work-related rumination—*affective rumination* and *problem-solving pondering* played different mediating roles. On the one hand, *affective rumination* caused by WCBA would further have a negative impact on work-family balance. On the other hand, *problem-solving pondering* caused by WCBA was conducive to work-family balance, reducing the negative impact of WCBA on work-family balance. At the end of the study, we also confirmed that *boundary segmentation preference* can effectively moderate the effect of work-related rumination on work-family balance, which gives us an in-depth understanding of the potential individual moderating mechanism. Our findings emphasized the internal mechanism of the impact of WCBA on work and family.

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