Article

After-Hours Use of Technology and Workers' Green Job Outcomes: Impact of Work–Family Conflict in the Organization

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Abstract

This research explores the impact of technology usage after work hours on workers' green job outcomes, including green job performance and wellbeing. It also aimed to investigate the mediating role of work–family conflict among them. Drawing on the role conflict theory (RCT) and the job demands–resources (JDR) model, this study fills the current research gap regarding the way technology-driven job intrusion affects employee green job outcomes and clarifies the underlying path through which the mediating variable work–family conflict plays its crucial role. We collected data through an electronic survey from 334 workers of foreign companies working in Shanghai city in China. Results showed that workers' use of technology after their work hours is negatively associated with their green job outcomes, specifically green job performance and wellbeing. We further found work–family conflict as a mediating variable in the associations between after-hours use of technology and (a) green job performance and (b) wellbeing, two green job outcomes of workers in organizations. This research offers significant practical implications regarding how organizations can achieve a balance between the use of technology and their green job outcomes in this technological era. We also discuss limitations and future research directions.

Keywords: after-hours use of technology; green job outcomes; wellbeing; performance; work-family conflict

1. Introduction

Digital technology, with its continuous advancement, has permeated into the work and lives of workers and has constantly blurred the boundary between the two. Understanding the two-way impact of technology has become a central issue in organizational management. The usage of technology in the workplace is growing as a result of its ongoing development. The distinction between work and personal life is becoming increasingly hazy as a direct result of this. Due to organizational requirements and the trend toward telecommuting, employees are using work technologies more frequently outside of their regular working hours (e.g., Chen et al., 2024).

Although technology improves connectivity, its use outside of business hours raises concerns about worker productivity, health, and work–life balance. Various studies have found that utilizing technology after work can increase flexibility (Reinke & Ohly, 2021), while other studies have linked it to stress and burnout (van Zoonen et al., 2020). At

present, the existing research lacks a complex theoretical framework for the specific impact of technology usage on workers. Therefore, the theoretical significance of this study is that it examines the mediating mechanism between employees' use of technology after work and its outcomes (Chen et al., 2024). Organizations these days require their workers to be on standby at all times (such as replying to messages after work or working overtime). Although this "always-on" working mode aims to enhance efficiency, it actually exhausts employees and reduces their work efficiency. The challenge that enterprises are facing now is that they clearly want to solve the problems brought about by this working culture, only to find that these problems (employees being exhausted and inefficient) themselves are caused by this working mode (Sharif et al., 2025; van Zoonen et al., 2020). This practical managerial dilemma highlights a critical research gap: a need for frameworks that explain the process through which technology use leads to negative outcomes rather than merely documenting the association.

Our study puts forward evidence-based suggestions to help create a healthy office environment and also investigates how the "contradiction between work and family" would affect the effectiveness of these environmental protection measures. The difficult-to-handle issue of work–life balance has always affected employee health (public health), team psychology (organizational psychology), and corporate personnel strategies (human resource management), and it is precisely the research focus in this field. According to the literature, using technology after hours has two drawbacks. Technology is especially useful for employment flexibility and workplace adaptability in a complex, multi-level organizational working environment (Reinke & Ohly, 2021). However, as J. Khalid et al. (2023) note, the growing use of technology may make it harder to distinguish between personal and work life, which could result in more stress and worsen worker wellbeing. There have been notable gaps. Although prior research has proposed work–family conflict as a possible mediator, (Handelzalts et al., 2024; Weise et al., 2025) are of the view that there are not many empirical studies that examine its role in relation to technologically induced work invasions.

Second, the majority of past research concentrates on the direct effects of technology use on job performance and employee wellbeing, often conflating these distinct outcomes or overlooking the specific mediating mechanisms that explain their relationship. As a result, the diversity of mediating variables has not yet received much attention, and the mediating mechanism between the independent and dependent variables is frequently disregarded (López-Cabarcos et al., 2022). Thirdly, the strength and direction of these interactions are inconsistent in the literature. These empirical inconsistencies point to a gap in understanding the boundary conditions and intervening variables, such as work–family conflict, that clarify when and how technology use affects employees. Numerous studies have revealed conflicting findings about the relationship between burnout and technology use (M. Russo & Morandin, 2023). These differences necessitate more research into mediating and environmental factors.

Our research addresses these shortcomings by working with a more thorough model based on work–family conflict. According to role conflict theory, employing technology outside of the workplace promotes work–family conflict by invading personal time and thus aggravating role strain (Kahn et al., 1964). Such disruptions deplete mental and emotional reserves, which impacts both general health and work productivity. This study is unique in that it separates the two ways that work–family conflict affects different outcomes using a dual-path mediation model.

Our study aims to make three contributions: (i) we examine the association of technology use after work by workers and their green job outcomes, (ii) we explain the mediating role of work–family conflict in the relationship between technology use and its green

job outcomes, and (iii) we provide detailed information on how organizational policies could lessen negative consequences towards workers' green job outcomes in organizations. Figure 1 explains our research model.
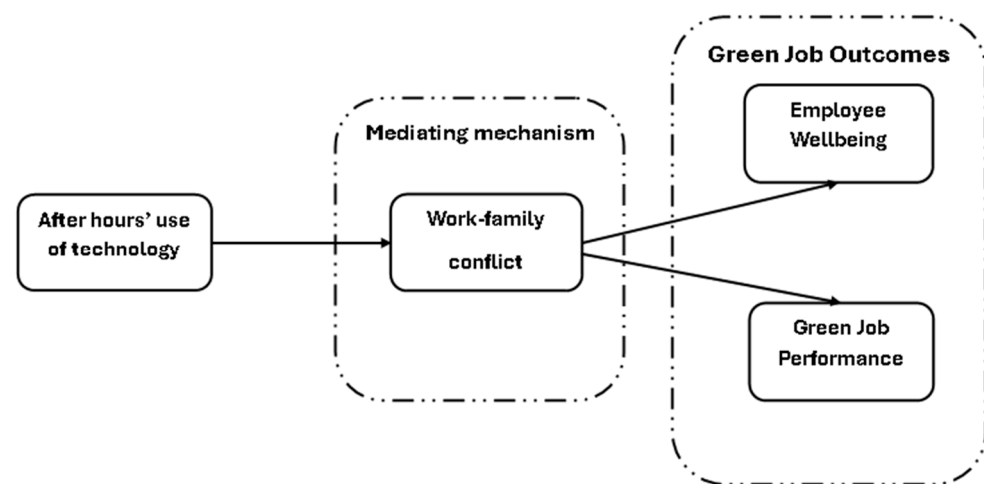

Figure 1. Theoretical framework.

The theoretical framework (Figure 1) describes the relationships among variables and the role of conflict theory. When employees engage with technology outside of their normal working hours, the boundary between professional and personal life becomes blurred, intensifying work–family conflict. This, in turn, leads to a decline in green job outcomes. Previous studies in the literature have documented direct associations, such as increased stress levels; thus, it is probable that the unmediated use of technology can independently influence these outcomes.

2. Theory and Hypothesis Development

Our theoretical model, as mentioned in Figure 1, is based on the dual framework combining the JDR model and role conflict theory. Together, these frameworks serve as the basis for our hypotheses concerning green employee performance and wellbeing. While existing evidence supports a link between technology use and increased productivity in the workplace, significant knowledge gaps remain regarding the specific mechanisms and boundary conditions of this relationship (Shi et al., 2023). There are limited studies examining the impact of technology-induced job intrusion on work–family conflicts. Furthermore, prior research conflates performance with wellbeing, neglecting other potential mediating pathways. (López-Cabarcos et al., 2022). Additionally, the outcomes of different studies vary greatly. For example, few have found a moderate association between the use of ICT and exhaustion (E. Russo et al., 2023), while others have revealed a significant impact, as pointed out by J. Khalid et al. (2023).

The JDR model operates on two key assumptions: (1) that every job characteristic can be categorized as either a demand (potentially depleting physiological/psychological resources) or a resource (functional in achieving goals and stimulating growth), and (2) that these demands and resources trigger two distinct psychological processes, a health impairment process and a motivational process, which ultimately influence employee wellbeing and performance (Bakker & Demerouti, 2007). Role conflict theory (Kahn et al., 1964) assumes that individuals occupy multiple social roles (e.g., worker and parent), and that incompatibility between the expectations of these roles generates psychological stress and strain. By integrating these frameworks, we posit that after-hours technology use acts as

a salient job demand that triggers role incompatibility (between work and family roles), thereby activating the health impairment process described by the JDR model.

The JD-R model does not presume that all job characteristics uniformly serve as demands or resources; instead, their categorization is contingent upon the contextual framework in which they are situated (Bakker & Demerouti, 2007). In environments with stringent organizational norms regarding constant availability and responsiveness, after-hours technology usage transitions from a potential resource to a hindrance demand. In these circumstances, the use of technology ceases to be voluntary or empowering, transforming into an externally enforced obligation that hinders recovery efforts and exhausts psychological resources. Our theorization does not refute the potential resource function of technology use; instead, it delineates the circumstances in which after-hours technology use primarily serves as a hindrance demand. Role conflict theory explains the emergence of work–family conflict, while the JD-R model explains how this conflict depletes psychological resources, resulting in impaired wellbeing and performance.

2.1. After-Hours Use of Technology, Employee Wellbeing, and Job Performance

The extant literature has shown diverse points of view. Scholars have associated post-work technology use with heightened stress and burnout (Sharif et al., 2025; van Zoonen et al., 2020). To comprehensively understand how technology engagement beyond regular working hours influences employee productivity, it is essential to consider intervening mechanisms such as work–family conflict. To make the relationship between variables clearer, the following three aspects of technology use, work–family conflict, and employee outcomes are discussed.

After-hours use of technology (Chen et al., 2024) is referred to the situation when workers use digital tools for work when the business is not open. Checking emails at odd times or going to online meetings on the weekends are common examples. Empirical research increasingly emphasizes that technologies originally thought to increase output actually have negative impacts. For instance, a long period of online engagement can lead to a decrease in life satisfaction due to an increase in emotional exhaustion and stress (Adams, 2019; van Zoonen et al., 2020). These outcomes arise when employees are emotionally and mentally powerless to detach from their work. According to J. Khalid et al. (2023), the expectation of being continually online and the popularity of such an organizational culture are the key reasons for using technology after work. This damages employees' capacity to sustain good work–life balance, achieve good performance, and experience wellbeing in organizations.

Employee wellbeing is comprehensively defined by the World Health Organization (WHO) in 2021 as the physical, mental, and social health of individuals within their work environment. According to the job demands–resources (JDR) model (Bakker & Demerouti, 2007), excessive job demands, such as the requirement to use information and communication technology (ICT) beyond official working hours, drain employees' emotional energy and thus decrease their sense of happiness. Within the JD-R framework, job characteristics can be categorized as either demands or resources. In this study, we conceptualize after-hours technology use when it is driven by organizational expectations and "always-on" norms as a hindrance demand. It depletes emotional and cognitive resources by preventing psychological detachment from work, thereby inhibiting recovery and activating the health impairment process (Bakker & Demerouti, 2007; Reinke & Ohly, 2021). While technology use can sometimes serve as a resource (e.g., increasing flexibility), in our sampled context of mandated connectivity, its demand characteristics are hypothesized to dominate. This depletion is often mediated by work–family conflict, which reduces recovery time and fosters increased anxiety (Zeshan et al., 2025). For example, employees who frequently engage with

work-related technologies outside of office hours tend to experience stronger work–family interference and report lower psychological wellbeing (A. Khalid & Syed, 2024).

Job performance is described by Koopmans et al. (2014) as a factor reflecting employees' effectiveness in fulfilling organizational expectations through task competency, appropriate adaptation, and goal attainment, influenced by inspiration, intellectual resources, and workplace constraints. While technology enhances work efficiency, its usage beyond regular hours may lead to fatigue and cognitive overload, thereby impairing outcomes (López-Cabarcos et al., 2022). This negative effect is exacerbated by work–family conflict as it detracts focus from essential work-related tasks (E. Russo et al., 2023). As an illustration, employees who experience work–family conflict due to ICT intrusion indicate that they are less focused and make more mistakes (Atatsi et al., 2019). When work exceeds family time, it leads to disruptions in household routines and increased role strain (Handelzalts et al., 2024). Conflict has increased among employees who must attend to work-related concerns outside of regular business hours, as noted by E. Russo et al. (2023).

Further psychological exhaustion and a shortened recovery time have previously been associated with further constant connectedness (Reinke & Ohly, 2021). For instance, van Zoonen et al. (2020) found that cellphone usage after work would make employees feel less happy and more likely to have work–life issues. Adams further noted that being stopped at work regularly can negatively impact mental health and quickly lead to extreme stress and physical and mental exhaustion.

To do a good job, you need to use your cognitive and emotional resources in a flexible way. For example, you need to pay attention, be morally engaged, and keep working toward environmental goals. Work–family conflict drains these discretionary resources by forcing people to focus on managing their roles and controlling their emotions, which means there are fewer resources available for voluntary, sustainability-oriented behaviors. Drawing further on role conflict theory (Kahn et al., 1964), the use of work-related technology after hours extends job demands into the family domain, blurring role boundaries and creating inter-role incompatibility. Empirical studies support this, showing that frequent after-hours technology use is linked to higher work–family conflict (Boswell & Olson-Buchanan, 2007; Chen et al., 2024). Based on the detailed discussion, we conclude the following three hypotheses. Based on role conflict theory (Kahn et al., 1964), we therefore contend that after-hours technology use consistently transfers work obligations into the familial sphere, thereby escalating work–family conflict.

H1. *There is a positive association between after-hours use of technology and employee work–family conflict.*

H2. *There is a negative association between after-hours use of technology and employee wellbeing.*

H3. *There is a negative association between after-hours use of technology and green job performance.*

2.2. Role of Work–Family Conflict as a Mediator

Work–family conflict is especially important when it comes to using technology after work hours because it shows how job demands can spill over into the private sphere. Work–family conflict directly reflects role incompatibility, unlike general strain constructs. This makes it theoretically aligned with technology-induced boundary violations instead of generic stress reactions.

Work–family conflict occurs when a worker's duties at home and at work are incompatible, when their personal and professional lives interfere, and when the demands of both places of employment create conflict between the two (Elloy & Smith, 2003). Conflict between work and family life occurs when expectations regarding responsibilities at work

and at home deviate (Handelzalts et al., 2024). Time-related problems, such as being absent from family events due to work, are especially prevalent in big organizations (Molina, 2021). Empirical studies have consistently demonstrated a strong link between elevated job demands and negative outcomes, including employee burnout and reduced job satisfaction (E. Russo et al., 2023). The role conflict theory, proposed by Kahn et al. (1964), posits that stress arises from conflicting expectations associated with several responsibilities. Employees frequently experience difficulty balancing professional responsibilities with familial obligations while utilizing work technology after hours. For example, "stress conflict" refers to the pressure of work obligations while one seeks relaxation, and "time conflict" involves attending to work emails during family time (Molina, 2021). This idea posits that employing work tactics post-work might exacerbate work–family problems, thereby impacting performance and health.

According to Pradhan and Jena (2017), working too much outside of regular business hours can cause fatigue and a decline in motivation, which can then decrease productivity during regular business hours. Work stress reduces cognitive performance, causing errors and delay tasks. Conflict between work and home might hurt performance by diverting attention from job performance to role stress management. (López-Cabarcos et al., 2022). Atatsi et al. (2019) explain that when employees are stressed out, they lose their creative thinking, resulting in lower-quality productivity. Therefore, based on the above discussion, we draw two hypotheses:

H4. *Work–family conflict serves as a mediating mechanism in the relationship between after-hours technology use and employee wellbeing.*

H5. *Work–family conflict serves as a mediating mechanism in the relationship between after-hours technology use and green employee performance.*

3. Methodology

3.1. People and Procedure

Based on the study objectives, the suggested mediating effects were statistically investigated using a cross-sectional survey approach. The selection of our methodological approach is well-supported by prior work (Asif et al., 2025; Podsakoff et al., 2003). Furthermore, while longitudinal studies are adept at examining changes over time, a cross-sectional design is best suited here because it efficiently captures the prevailing patterns across digital workplaces (Mitra et al., 2024; Pitafi et al., 2023). A key benefit of using Structural Equation Modeling (SEM) is its superior ability to handle both latent variables and inherent measurement error, which rectifies shortcomings common in standard regression techniques (Hair et al., 2006; Kanwal et al., 2022; Nand et al., 2020).

The data were collected over the course of six weeks, from January 2025 to April 2025.

Targeted employees who work full-time for international companies in Shanghai, like Disney, Starbucks, McDonald's, and others, are the focus of this study. Using convenience sampling approach as used in previous research (Murtza & Rasheed, 2023; Peng et al., 2024), employees were asked to take part in our survey by using business and social networks. Because of the way people in China are expected to work hard, this is an ideal place to get the most out of using technology more than work hours (J. Khalid et al., 2022, 2023).

To maintain statistical power in the Structural Equation Modeling (SEM) analysis, the Full Information Maximum Likelihood (FIML) method was used to manage the minimal missing data (<2%). The strictness assures the integrity of the data, yet it may result in an under-representation of less engaged employees (Podsakoff et al., 2003). The final sample consisted of 334 participants, comprising 51% male respondents. In terms of age distribu-

tion, 67% were between 25 and 40 years old. Regarding work experience, approximately half of the respondents (i.e., 49%) had 3–4 years of work experience. Regarding education level, 37% respondents had a bachelor's degree. Details of demographics can be seen in Table 1.

Table 1. Demographic information.

Group	Category	Frequency	Percentage (%)
Gender	Male	170	51
	Female	164	49
	Total	**334**	**100**
Age	Less than 25	40	12
	25–40	224	67
	40–55	50	15
	Above 55	20	6
	Total	**334**	**100**
Work Experience	Less than 1 year	40	12
	1–2 years	60	18
	2–3 years	70	21
	3–4 years	144	43
	More than 4 years	20	6
	Total	**334**	**100**
Education	High School	30	9
	College Diploma	70	21
	Bachelor's Degree	124	37
	Master's Degree	80	24
	Other Certification	30	9
	Total	**334**	**100**

3.2. Measures

The survey instrument was designed to measure four key variables, comprising a total of 26 items. To guarantee cross-cultural validity and language equivalence between the original English and the Mandarin translation, an adaptation technique involving a rigorous translation and back-translation procedure was implemented. The construct of after-hours use of technology was measured with a six-item scale from the studies of Boswell and Olson-Buchanan (2007) and Batt and Valcour (2003). Participants rated the frequency with which they used each type of technology (e.g., smartphone, laptop, and tablet) for work-related purposes outside of normal working hours. Responses were captured on a 5-point Likert scale ranging from 1 ("Never") to 5 ("Very Often"). The scores for the six items were averaged to create a composite measure of after-hours technology use intensity. This study modifies the original operationalization by Batt and Valcour (2003), which concentrated on the quantity of technologies employed, to measure the frequency and intensity of after-hours technology usage, aligning with contemporary ICT and technostress research (e.g., J. Khalid et al., 2023).

The construct of work–family conflict was measured using the scale from Carlson et al. (2000). This scale consists of nine items. These questions consider the effect of work on personal life. Workers' wellbeing was measured using the Warwick-Edinburgh Mental Wellbeing Scale (WEMWBS), which contains seven items. Green job performance behavior among our respondents was measured with a four-item scale from Lamm et al. (2015).

4. Analysis and Findings

Data analysis followed a three-stage process. Initially, we checked validity and reliability. The Kaiser–Meyer–Olkin (Charoensukmongkol & Puyod, 2022) measure (0.923) and Bartlett's Test ($p < 0.001$) confirmed factorability. Secondly, the hypotheses were evaluated using maximum likelihood estimation in AMOS 28.0. The model fit indices (CFI = 0.946; RMSEA = 0.068) were satisfactory, and Structural Equation Modeling (Greenbaum et al., 2013) met Hu and Bentler's (1999) thresholds. Furthermore, mediation analysis was conducted using the bootstrapping method with 5000 resamples. This approach allowed for the evaluation of indirect effects and the calculation of bias-corrected confidence intervals following the procedure recommended in (Preacher & Hayes, 2008; Younas, 2024).

Reliability analysis is used to evaluate the consistency of the results (displayed in Table 2) when the same object is repeatedly measured by the same method, reflecting the stability and reliability of the scale (questionnaire), and it is the basis for in-depth analysis (Riaz, 2024; Sharif et al., 2024).

Table 2. Reliability analysis.

Construct	Items	Loadings	Cronbach's α	CR	AVE
After-Hours Technology Use	I use a smartphone or landline for work-related purposes at home.	0.832	0.79	0.91	0.63
	I use a laptop for work-related purposes at home.	0.798			
	I use a tablet for work-related purposes at home.	0.845			
	I use a smartwatch to receive or respond to work-related communications at home.	0.835			
	I use a home printer or scanner for work-related tasks at home.	0.612			
	I use other digital technologies (e.g., communication or productivity tools) for work-related purposes at home.	0.807			
Work–Family Conflict	My work prevents me spending sufficient quality time with my family.	0.789	0.81	0.95	0.69
	There is no time left at the end of the day to do the things I'd like at home (e.g., chores and leisure activities).	0.891			
	My family misses out because of my work commitments.	0.882			
	My work has a negative impact on my family life.	0.884			
	Working often makes me irritable or short tempered at home.	0.763			
	My work performance suffers because of my personal and family commitments.	0.766			
	Family related concerns or responsibilities often distract me at work.	0.891			
	If I did not have a family I'd be a better employee.	0.749			
	My family has a negative impact on my day to day work duties.	0.754			

Table 2. *Cont.*

Construct	Items	Loadings	Cronbach's α	CR	AVE
Green Performance	I make suggestions to improve environmental performance.	0.792	0.76	0.96	0.79
	I recycle materials whenever possible at work.	0.788			
	I actively try to reduce waste at work.	0.837			
	I encourage others to act in environmentally friendly ways.	0.815			
Wellbeing	I've been feeling optimistic about the future.	0.854	0.81	0.88	0.65
	I've been feeling useful.	0.875			
	I've been feeling relaxed.	0.806			
	I've been dealing with problems well.	0.794			
	I've been thinking clearly.	0.846			
	I've been feeling close to other people.	0.853			
	I've been able to make up my own mind about things.	0.876			

The measuring model was created to assess the validity and reliability of the constructs that were included in our study. This approach establishes the internal consistency, convergent validity, and discriminant validity of the scales (Hair et al., 2011). All of our scales' item loadings are above the 0.60 criterion according to the results shown in Table 2, indicating that the observable variables reflect their latent constructs. The values of the Cronbach's alpha and Composite Reliability (CR) were likewise above 0.70, confirming acceptable internal consistency. In a similar vein, every Average Variance Extracted (AVE) score was higher than the benchmark of 0.50, meaning that their structures account for more than half of the variance in the indicators.

Table 3 reveals the intercorrelation among all our constructs, providing preliminary support for our hypotheses.

Table 3. Correlations and descriptive statistics.

Variables	Mean	SD	1	2	3	4	5	6	7	8
1. Gender	0.51	0.5	--							
2. Age	2.6	0.95	0.07	--						
3. Education	3.1	1.05	0.05	0.14 *	--					
4. Work Experience	2.9	1.1	0.1	0.48 **	0.18 *	--				
5. After-Hours Technology Use (AT)	3.4	0.8	0.06	−0.15 *	−0.1	−0.12	0.79			
6. Work–Family Conflict (WFC)	3.7	0.75	−0.05	0.16 *	0.11	0.14 *	0.38 **	0.83		
7. Green Job Performance (GP)	3.65	0.7	−0.06	0.12	0.1	0.11	−0.32 **	−0.41 **	0.81	
8. Wellbeing (WB)	3.75	0.78	−0.04	0.1	0.12	0.15 *	−0.35 **	−0.45 **	0.38 **	0.89

Note: --: The correlation is statistically significant at the 1% level, *: correlation is less than 0.05, **: correlation is less than 0.01.

The Fornell Larcker and HTMT criteria were used to assess discriminant validity in our studies. As shown in Table 4, the square roots of AVEs (diagonal values in) were higher than their inter-construct correlations, confirming discriminant validity. Furthermore, Table 5 shows that all HTMT ratios were below the 0.85 conservative threshold, providing further support for discriminant validity (Rasheed et al., 2020).

Table 4. Fornell–Larcker criterion for discriminant validity.

Construct	AT	WFC	GP	WB
After-Hours Technology Use (AT)	**0.79**			
Work–Family Conflict (WFC)	0.38	**0.83**		
Green Job Performance (GP)	−0.32	−0.41	**0.81**	
Wellbeing (WB)	−0.35	−0.45	0.38	**0.89**

Table 5. Heterotrait–Monotrait (HTMT) ratios.

Construct	AT	WFC	GP	WB
After-Hours Technology Use (AT)	--			
Work–Family Conflict (WFC)	0.46	--		
Green Job Performance (GP)	0.4	0.52	--	
Wellbeing (WB)	0.43	0.58	0.47	--

Note: --: The correlation is statistically significant at the 1% level.

The structural model was computed using a bootstrapping procedure with 5000 re-samples, consistent with recommendations for significance testing in PLS-SEM, as recommended in previous studies (Hair et al., 2011; J. Khalid et al., 2022; Moin et al., 2024).

The results reported in Table 6 and illustrated in Figure 2 reveal that work–family conflict has a significant positive association with after-hours technology use (β = 0.41, t = 6.83, $p < 0.001$), supporting H1. After-hours technology use was found to be negatively associated with employee wellbeing (β = −0.28, t = −4.12, $p < 0.001$), providing support for H2, and similarly revealed a significant negative relationship with green job performance (β = −0.22, t = −3.25, $p = 0.001$), supporting H3.

Table 6. Results of hypothesis testing.

Hypothesis	Path	β	SE	t-Value	*p*-Value	Result
H1	AT → WFC	0.41	0.06	6.83	<0.001	Supported
H2	AT → Wellbeing	−0.28	0.07	−4.12	<0.001	Supported
H3	AT → Job Performance	−0.22	0.07	−3.25	0.001	Supported
H4	AT → Wellbeing (via WFC)	−0.12	0.04	3.1	0.002	Supported
H5	AT → Job Performance (via WFC)	−0.10	0.04	2.65	0.008	Supported
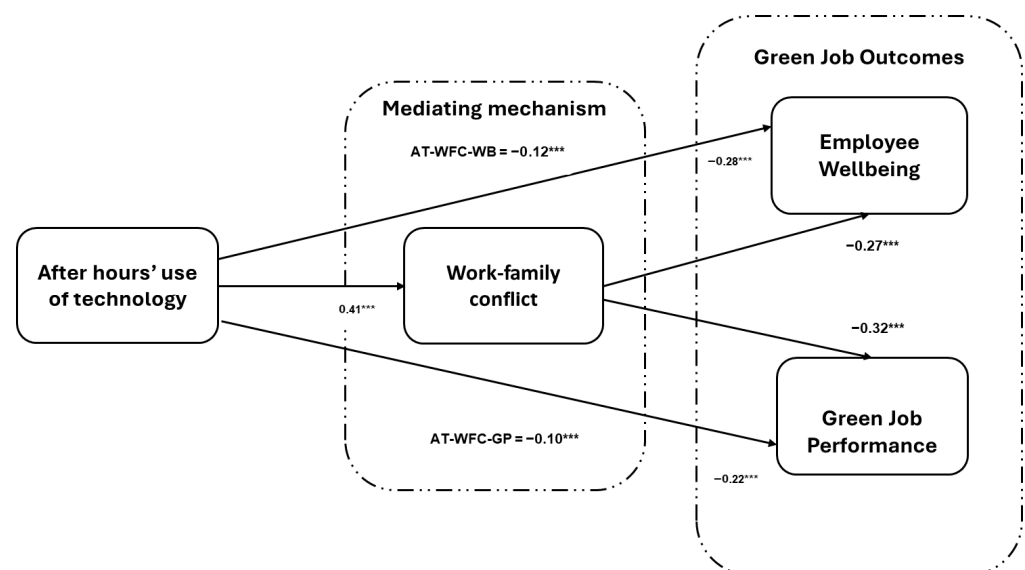
Figure 2. Structural Equation Model diagram. ***: The correlation is significant at less than 0.001.

The mediating role of work–family conflict found in our study indicates that the indirect effect of after-hours technology use on employee wellbeing through work–family conflict was significant (β = −0.12, t = 3.10, *p* = 0.002), offering support for H4. Likewise, the mediating effect of after-hours technology use on job performance through work–family conflict was also significant (β = −0.10, t = 2.65, *p* = 0.008), supporting H5.

5. Discussion

5.1. Discussion of Results

This study examined the relationships between after-hours technology use and key employee outcomes, specifically, work–family conflict, wellbeing, and green job performance. The theoretical foundation for the study was established by integrating role conflict theory (Kahn et al., 1964) with the JDR model (Bakker & Demerouti, 2007) to explore the mediating role of work–family conflict. The analysis discovered three principal findings. Initially, a significant negative association was established between after-hours use of technology and both employee wellbeing and green job performance. Second, work–family conflict emerged as a significant mediator. Third, the dual-path mediation model highlighted distinct mechanisms aligning with the resource depletion processes described in the JDR framework.

These findings effectively build upon and expand prior research. The more robust mediation pathway to wellbeing supports the assertion presented by (Manoppo, 2020) that encompasses broader emotional and cognitive resource drains. Furthermore, the established negative relationship between post-work technology use and wellbeing is consistent with burnout research conducted by Adams (2019). In contrast to López-Cabarcos et al. (2022), our results indicate a less pronounced negative link between work–family conflict and green job performance. This observed disparity may be understood through specific contextual factors. In occupations characterized by high discretionary power, such as roles within multinational enterprises (MNEs), employees may possess the autonomy to temporarily compensate for performance declines by intensifying their focus during work hours.

5.2. Theoretical Implications

The present study offers three key theoretical contributions. First, it explicitly integrates the JDR model with role conflict theory to delineate a previously underexplored mechanism: how post-work technology use triggers role stress, which in turn depletes emotional and cognitive resources, leading to diminished employee outcomes, thereby addressing a persistent gap in the literature where direct and indirect effects have often been conflated (Handelzalts et al., 2024; López-Cabarcos et al., 2022). This research combines the job demands–resources (JDR) model with role conflict theory to delineate a previously underexplored mechanism. It demonstrates how post-work technology use triggers role stress, depletes psychological resources, and ultimately influences employee outcomes, representing a pathway that has been insufficiently examined in the prior literature (Chen et al., 2024).

Second, it moves beyond treating wellbeing and performance as unitary outcomes by demonstrating distinct mediating pathways. Our findings suggest that work–family conflict primarily impairs wellbeing through substantial emotional exhaustion, whereas its effect on performance is more modest and likely supplemented by other mediators like cognitive overload. This provides a novel, dual-path perspective. Third, methodologically, the use of SEM with bootstrapping helps resolve prior inconsistencies by robustly quantifying these distinct direct and indirect effects. Fourth, we investigated our research model in the unique context of China, where technology use is rising with every passing day and

after-hours technology use has become a major issue in this collectivistic culture (J. Khalid et al., 2023).

This study conceptually enhances the literature by reclassifying after-hours technology use from a neutral work practice to a role-invading job demand, with repercussions manifesting through inter-domain conflict mechanisms. By combining JD-R and role conflict theory, we provide a process-based explanation of how digital connectivity makes it harder for employees to achieve long-term success.

The collectivistic culture and strong norms of obligation and responsiveness in China make it a good place to study this issue because they may make people expect to always be available. This makes it more likely that using technology after hours will be a requirement rather than a choice.

5.3. Practical Implications

This research puts forward three actionable recommendations for organizations for solving the widespread problem of "*the inability to completely separate work and life*" within enterprises. First of all, enterprises can formulate restrictive policies on the use of technology after work hours. This is likely to help reverse the technological intrusion after work hours, reduce conflicts between work and family, and the corresponding consequences. For instance, Volkswagen requires the email server to be shut down after working hours, which is related to the goal of enhancing employee wellbeing (van Zoonen et al., 2020). Second, to replenish depleted resources, targeted interventions such as structured recovery training (e.g., digital detox workshops) and the promotion of psychological detachment should be implemented, as these directly bolster the wellbeing pathway identified in our model (Reinke & Ohly, 2021). Thirdly, to safeguard performance, enterprises should calculate the actual contributions of employees more scientifically and can also include the scattered work completed after work hours in the performance assessment. Enterprises should place more emphasis on work efficiency rather than working hours, which can support continuous productivity improvement.

5.4. Limitations and Future Research Directions

Although this study reveals the mechanism of association between non-working time technology use and work–family conflict, the limitations of its methodological and contextualized application should be addressed. First of all, our study is cross-sectional as we collected data for all of our model variables at one time point from same respondents. Future researchers can validate our model with longitudinal or experience sampling research methods, which may generate interesting research findings. Future researchers may also replicate our proposed model in a Western individualistic culture to determine whether a different context generates different findings. Next, our research model outlines one mediator in the form of work–family conflict; future researchers can theorize and test alternative explanations in the associations we theorized between after-hours technology use and employee outcomes. Similarly, future researchers can theorize and test a boundary condition in our model. In this context, employee personality can be an interesting moderator. Finally, our model was investigated with a self-report single-source data. Future researchers can investigate our proposed research model with a multisource and objective data. For instance, employee job performance ratings can be obtained from supervisors, and their after-hours use of technology can be measured with objective ratings.

5.5. Conclusions

This study revealed that after-hours use of technology is a "*double-edged sword.*" Although technology offers flexibility and convenience in work, it also blurs the line between work and life, triggers conflicts between work and family, and, to a certain extent, reduces

employees' green job performance and wellbeing. Our findings revealed that persistent connectivity imposes psychological and emotional strain that ultimately diminishes employees' capacity to perform sustainably and maintain healthy levels of wellbeing. Importantly, the results highlight work–family conflict as a central mechanism through which technology overuse exerts detrimental effects, emphasizing the need for organizations to regulate expectations around after-hours communication.

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