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**Excessive technology use in the post-pandemic context: How work connectivity
behavior increases procrastination at work**

Abstract

Purpose – Using role stress theory, this study examines how work connectivity behavior (WCB) blurs the lines between employees' work and personal lives, thereby encouraging procrastination at work (PAW). The study also investigates the importance of role stress and remote work self-efficacy (RWSE) as mediating and moderating factors, respectively.

Design/methodology/approach – The study examines the direct and indirect relationships between WCB and PAW using hierarchical regression and data from 415 Chinese teleworkers. RWSE is also estimated as a second-stage moderator.

Findings – The findings indicate that WCB has a direct and indirect (via role stress) positive influence on PAW; however, these effects are weaker among employees with higher (vs. lower) RWSE.

Practical implications – This study assists managers and organizations in developing more efficient ways of maximizing employee and organizational performance while minimizing the counterproductive behaviors associated with excessive technology use.

Originality/value – By investigating the links between WCB and PAW in the post-pandemic context, this study adds a new perspective on how excessive technology use for work and non-work purposes can be counterproductive.

Keywords: Post-pandemic context, work connectivity behavior, procrastination at work, role stress, remote work self-efficacy

1. Introduction

The COVID-19 pandemic has brought significant changes to people's daily lives and the world of work (Bocean et al., 2021; Schifano et al., 2021). Due to regional and national lockdowns, as well as infection control measures and restrictions, many organizations now require employees to work remotely (also known as teleworking, telecommuting, or work from home) as part of their day-to-day jobs. In this context, internet-based platforms have become increasingly popular as a means for employees to perform their jobs at any time and location. For example, WeCom (a Chinese teleworking platform similar to Zoom) increased its user base from 60 million in 2019 to 250 million in May 2020, and 400 million by the end of 2020. This trend demonstrates how COVID-19 has transformed remote work from a rare occurrence for many organizations and their employees to the new norm (Mihalca et al., 2021). Adapting to this new status quo has been challenging due to inadequate staff training and support for skill enhancement (Kniffin et al., 2020). Nevertheless, for many workers, remote work is here to stay (Felstead and Reuschke, 2021), and as the daily use of teleworking continues to grow in China and globally, so will employees' work connectivity behavior (WCB). The question then becomes, how does WCB affect employees' performance both inside and outside of the workplace, and what are some of their coping strategies?

WCB is defined as an employee's constant use of internet-based devices in any location to maintain job-related communication, undertake multiple tasks, and perform work and nonwork duties simultaneously (Yuan and Tang, 2018). In recent years, this concept has gained traction as an important area of management research due to its potential to influence employee well-being both positively and negatively (He and Yu, 2020; Wang et al., 2019b; Xie et al., 2018). On the one hand, WCB gives employees more flexibility and control over their work and nonwork responsibilities, thereby promoting work-life balance. In contrast, it could turn employees into 'professional slaves' who are constantly connected to work through technology.

This increases the likelihood of procrastination, i.e., putting off important tasks and delaying them until later. Although procrastination is often thought to have less adverse consequences than other negative behaviors such as demotivation and duty avoidance, it has been linked to poor employee and organizational performance (Teng, 2020). It is also considered a source of low productivity (Metin et al., 2016; Wang et al., 2021b), which has significant implications for workplace productivity.

The topic of PAW has received considerable empirical attention (Metin et al., 2016; Wang et al., 2021a), particularly in remote work contexts where employees have little direct managerial control. Past research has mostly looked at PAW as a self-regulatory failure, driven largely by the procrastinators' inability to harness physical and psychological resources (Sirois and Pychyl, 2012). Specifically, individuals are more likely to put off completing work-related tasks when they are emotionally drained from work-life pressure, regardless of the negative consequences of the delay. In attempting to explain the antecedents and outcomes of PAW, prior research has predominantly utilized psychological models such as the ego-depletion model of self-regulation (Wagner et al., 2012), emotional coping (Nie et al., 2020), and person-organization fit characteristics (Teng, 2020). They generally view procrastination as an individual's strategy for coping with the physical and mental exhaustion caused by work-life pressure, or, to put it another way, as a mechanism for reducing resource consumption and replenishing physical and mental resources. This appears to be a good starting point for comprehending how WCB increases PAW. We argue that because WCB typically occurs outside of work hours and has the potential to blur work-life boundaries (Schlachter et al., 2018; He and Yu, 2020), it can increase stress and delay the completion of work-related tasks.

Drawing on role stress theory (Kahn, 1964), we examine how WCB increases PAW. First, we argue that WCB makes it more difficult for employees (particularly teleworkers) to balance their work and nonwork responsibilities, causing considerable delays in completing

work-related tasks (viz. PAW). This is particularly problematic in today's post-pandemic context where many organizations are encouraging employees to work from home. Second, we consider the importance of role stress as the mechanism via which WCB influences PAW. According to the role stress theory, role stress occurs when people's actions are incompatible with the expected behavior required to effectively complete assigned tasks (Newton and Keenan, 1987). WCB is one action that exacerbates role stress because it encourages excessive technology use and keeps employees constantly connected to their jobs. As a result, these employees may find it difficult to mentally separate themselves from work-related activities, leaving them unable to effectively balance the demands of their work and family obligations. Given this, we see WCB as a negative factor that exacerbates role stress and reduces task efficiency, resulting in PAW.

Prior research has emphasized the need to investigate the boundary conditions for WCB and employee outcomes (Schlachter et al., 2018). In their daily diary study, for example, Derks et al. (2014) found that employees' work-family segmentation preference and perceived work-family segmentation norm in organizations moderate the positive effects of WCB on work-family conflict and emotional exhaustion. Similarly, Gadeyne et al. (2018) investigated how work-related ICT use outside of work hours, integration preference, and workplace characteristics influence work-to-home conflict through a three-way interaction. Inspired by these findings, we argue that remote work self-efficacy (RWSE: defined as individuals' assessment about their ability to execute assigned work-related tasks and achieve desired goals in a nonwork context; Staples et al., 1999) will act as a second-stage moderator on the indirect relationship between WCB and PAW via role stress. We rely on the idea that employees with a strong sense of RWSE are typically more confident in their ability to successfully complete specific tasks and, as a result, exert greater effort to meet work-life demands (Tramontano et

al., 2021). In this sense, any positive indirect relationship between WCB and PAW via role stress will be weaker for individuals with higher (vs. lower) levels of RWSE.

Our research (Figure 1) makes important theoretical and practical contributions. First, by exploring the links between WCB and PAW, we shed new light on a timely issue that had been overlooked in previous work-life research. In today's post-pandemic era, where remote work is more prevalent and employees must balance their personal and professional lives (Kniffin et al., 2020), WCB and PAW pose significant challenges for both employees and their employers. Recognizing this reality, the present study contributes to our understanding of how obsessive connectivity to mobile and electronic devices during non-working hours blurs the work-life boundary and potentially impairs employees' well-being and performance (He and Yu, 2020; Kossek et al., 2011; Schlachter et al., 2018). Second, we address key theoretical questions about the mechanisms through which WCB can influence employees' non-work experiences by raising their stress levels (Yuan and Tang, 2018). In doing so, we argue that individuals have a generally low capacity to cope with WCB and role stress due to limited amounts of physical and mental resources, which in turn spurs them to procrastinate or delay the completion of important work tasks. Third, using moderated-mediation analysis, we provide a deeper understanding of personal characteristics, such as RWSE, that can assist individuals in mitigating the negative consequences of WCB and PAW.

--Insert Figure 1 here--

2. Theory and Hypotheses

2.1 Influence of WCB on PAW

Role stress theory (Kahn et al., 1964) is critical to understanding how WCB increases PAW. The fundamental premise of this theory is that individuals are predisposed to take on multiple roles in their personal and professional lives, which puts a significant amount of strain on their mental health and well-being (Newton and Keenan, 1987; Örtqvist and Wincent,

2006). Accordingly, three main factors contribute to this type of stress-related experience: role conflict (incompatible demands placed on a person due to multiple role obligations), role ambiguity (lack of clarity in understanding the actions required to fulfill multiple role obligations), and role overload (lack of personal and psychological resources available to fulfill multiple role obligations). Coping with such situations can be difficult and complex, especially in the work-life context, where individuals may struggle to balance the competing demands of their work and family roles. For example, a teleworker who spends hours responding to daily work-related emails may find it difficult to perform household responsibilities such as cooking, cleaning, and child care (Mesmer-Magnus & Viswesvaran, 2008). Without adequate levels of support, the teleworker would experience work-nonwork conflict (Wood et al., 2020), resulting in PAW or delays in completing work-related task effectively.

PAW is a stress-induced response characterized by a lack of self-regulation and, as a consequence, fear or apprehension about completing an upcoming work-related task (Metin et al., 2016; Wang et al., 2021a). Even though most teleworkers can maintain high-performance outputs while working remotely, they may occasionally struggle with this type of self-regulation failure (Hen et al., 2021); implying that PAW can be a significant challenge for them, particularly in today's post-pandemic business environment (Wang et al., 2021b). Metin et al. (2016) suggested that there are essentially two forms of PAW. The first is 'soldiering,' which is simply the avoidance of work-related tasks due to low morale or being in the wrong frame of mind. Examples of this behavior include taking longer coffee breaks, daydreaming, and checking websites for reasons unrelated to work. The second form of PAW is 'cyberslacking' (also known as cyberloafing), which occurs when employees use their employer-provided internet-based services or devices for personal use during work hours. It is associated with significant reductions in productivity levels, as well as broader issues such as

information security breaches, network bandwidth overload, spyware infections, and virus malware introduced through illicit software downloading (Tandon et al., 2022).

Our expectation for a positive relationship between WCB and PAW is predicated on two main reasons. First, due to the COVID-19 pandemic, contemporary workplaces now incorporate a variety of internet-based platforms into the daily work patterns of employees. While these platforms can help some employees be more flexible or creative at work, others are now constantly checking their email, using instant messaging, and participating in internet-based video calls after normal work hours have ended (Büchler et al., 2020; Dhir et al., 2018). At the same time, organizations now expect employees to demonstrate commitment by being constantly available online and responding promptly to work-related tasks, regardless of time or location (Adisa et al., 2021). These expectations can be counterproductive, as excessive connectivity to internet-based platforms can be detrimental to employees' physical and psychological well-being (Islam et al., 2022). Singh et al. (2022) agrees, arguing that obsessive technology use in today's post-pandemic era has created an 'always-on' culture in which employees are compelled to stay visible online, if only to demonstrate they were not shirking their work responsibilities while working from home. Similarly, He and Yu (2020) noted that employees in today's fast-paced business landscape are subject to new pressures, such as never-ending expectations of virtual meetings or having to sit in front of computer screens for longer periods of time, both of which can delay the effective completion of job tasks.

Second, even prior to the pandemic, there was evidence that work intensity had increased across industries and sectors due to economic uncertainty, recessionary pressures, and the resulting threats of job and income insecurity (Ogbonnaya et al., 2022b; Wood and Ogbonnaya, 2018; Wood et al., 2020). In this light, employees are expected to work harder, take on larger workloads, and meet strict deadlines, often without adequate levels of organizational support. Then came the COVID-19 outbreak, exacerbating an already difficult

situation and forcing people to work from home despite other family-related demands such as homeschooling and child care (Adisa et al., 2021). As a result, many employees resorted to obsessive use of electronic devices and social media as a coping mechanism, primarily for personal reasons unrelated to work (Malik et al., 2021). While this helped to divert the attention of some employees away from pandemic-related concerns or worries, it also resulted in social media fatigue and self-regulation failure for others, causing significant disruptions in completing work-related tasks (Islam et al., 2022). Based on the foregoing, it is reasonable to expect that continued connectivity will promote PAW, particularly given that employees have limited psychological resources to deal with work-related preoccupations.

Hypothesis 1: WCB has a positive influence on PAW.

2.2 Mediating influence of role stress

As previously stated, role stress occurs when employees are unable to perform effectively because their actions are incompatible with the expected behavior to complete work-related tasks. This viewpoint has been adopted by numerous studies on role stress theory, implying that role stress can be conceptualized as an outcome of an imbalance between the external demands placed on employees and the resources available to them to meet those demands (Cooper et al., 2001; Cui et al., 2014). In the work-life context, role stress occurs when employees are confronted with ambiguous and conflicting demands between their work and family roles, making performance in that domain more challenging (Mesmer-Magnus & Viswesvaran, 2008). This places a significant strain on a person's personal and psychological resources, potentially leading to mental health issues such as burnout, exhaustion, psychological strain, and emotional distress (Allen et al., 2000; Newton and Keenan, 1987; Stoeva et al., 2002). Other studies have concentrated on behavioral and performance outcomes, suggesting that role stress in the work-life domain can lead to work apathy, an unwillingness

to learn new skills on the job, and a lack of interest in generating innovative ideas at work (Ogbonnaya, 2019; Zhang et al., 2019a).

The above characteristics of role stress indicate that it may serve as a mediator between WCB and PAW. There are at least three reasons for believing this to be true. First, excessive use of technology, along with the pressures and complexities it generates, has been associated with feelings of exhaustion, fatigue, restlessness, and physical discomfort in both personal and professional settings (Tarafdar et al., 2015; Wang et al., 2021b; Wang et al., 2017). In less severe instances, individuals may struggle to fulfill their job responsibilities; however, in more severe cases, they may deliberately abandon assigned tasks or postpone crucial deadlines at work (Cenamor et al., 2019, Viglia et al., 2018). Second, several studies (Dhir et al., 2018; Ragu-Nathan et al., 2008; Singh et al., 2022; Tarafdar et al., 2019) have suggested that constant internet-based connectivity can trigger a stress-related response in which employees perceive their non-work time is being invaded by work-related activities. This concept is known as techno-invasion, which refers to the blurring of work and personal life boundaries, which leads to employees engaging in deviant behaviors such as violating organizational norms, cyberslacking, and soldiering. Chen et al. (2022) agreed with this perspective, arguing that the effects of techno-invasion can be observed in additional job parameters, such as prolonged multitasking and a reluctance to exert effort in completing work-related tasks on time.

Third, Singh et al. (2022) argued that the growing trend of conducting most work activities online increases stress levels because employees must constantly learn how to operate new technological applications. Singh et al. (2022) did not rule out the possibility that new and improved technology can help employees perform better or complete tasks faster; rather, they emphasized that constantly having to learn new skills or update one's technological knowledge can be mentally draining and counterproductive. This paradoxical effect was particularly severe during the pandemic, when many employees were faced with the challenge of rapidly

adapting to new technological platforms while also feeling anxious and exhausted from lockdowns, social isolation, and the abrupt shift in work patterns (Adisa et al., 2022; Laker et al., 2022; Ogbonnaya et al., 2022a). In this sense, working from home and remaining constantly connected to internet-based devices creates role stress and makes it difficult to maintain a healthy work-life balance. In addition, because this situation places a significant psychological strain on the employees' psychological well-being, it's possible that they will resort to PAW as a way to cope and mitigate their stressful experience. Based on the foregoing, therefore, we propose the following hypothesis:

Hypothesis 2: WCB has a positive indirect relationship with PAW via role stress.

2.3 Moderating influence of RWSE

Using role stress theory, we have thus far theorized about the direct and indirect (via role stress) relationships between WCB and PAW. Another important aspect of this relationship is the idea that employees' behavioral reactions to excessive technology use can be influenced by their personal and social circumstances in the work-life domain (Schlachter et al., 2018). For instance, the degree to which employees are able to separate various aspects of work and family obligations has been found to mitigate the effects of constant work-related technology use on work-family conflict and emotional exhaustion (Derks et al., 2014). Singh et al. (2022) also reported that the level of remote working intensity moderates the influence of excessive work-related technology use on employees' stress levels, with the impact being stronger for individuals whose remote work was less intense. These results indicate that there are critical boundary conditions that determine when the impact of WCB on PAW is likely to be more or less pronounced. Given this, we argue that employees with higher (vs. lower) RWSE are better able to cope with WCB and the associated stress levels, resulting in reduced PAW and more efficient completion of work-related tasks.

As previously defined, RWSE refers to employees' judgments or beliefs about their ability to effectively perform tasks in remote working settings, taking into account the level of organizational resources and support available to them (Staples et al., 1999; Raghuram et al., 2003). It is an important psychological characteristic that allows employees to maintain a balance between their personal and professional lives. Research suggests that employees with high RWSE are better positioned to feel more in control of their emotions, making it easier for them to power through uncertainty. This feature was particularly important during the COVID-19 outbreak, when organizations went through periods of managerial chaos and teleworkers had to deal with social isolation, emotional exhaustion, or having to quickly adapt to new technology platforms (Tramontano et al., 2021). In this regard, Staples et al. (1999) argued that organizations that can increase their employees' self-efficacy will have a more productive workforce capable of performing remote work tasks more effectively. Similarly, Raghuram et al. (2003) argued that higher levels of RWSE enable employees to develop digital resilience, thereby maximizing the advantages of remote work while minimizing its disadvantages.

Based on the foregoing, we hypothesize two scenarios in which RWSE would serve as a second-stage moderator. First, we argue that high levels of RWSE will mitigate role stress, thereby reducing any subsequent increases in PAW. This argument assumes that individuals who have a strong sense of RWSE are better equipped to tackle difficult tasks, shift their focus away from personal failings and negative outcomes, and prioritize competencies that promote employee well-being (Tramontano et al., 2021). They are also better prepared to deal with the stressors associated with digital forms of work, allowing them to work from anywhere in a sustainable and healthy manner (Grant and Clarke, 2020). For teleworkers, these are important features that can assist in dealing with role stress and completing work-related tasks effectively, while being able to juggle the competing demands of in the work-life domain. Specifically, high levels of RWSE implies that such employees are more confident in their ability to

overcome challenges, making them less likely to engage in counterproductive behaviors such as PAW (Wang et al., 2020). In contrast, employees with low RWSE are more susceptible to work-family distractions due to limited ability to self-regulate and confront uncertainties. Given this, we hypothesize that the positive relationship between role stress and PAW will be weaker among employees with higher (vs. lower) RWSE levels.

Hypothesis 3: RWSE will moderate the positive relationship between role stress and PAW, such that this relationship is weaker among employees with higher (vs. lower) RWSE levels.

Second, we argue that the positive indirect relationship between WCB and PAW via role stress will be weaker for employees with higher (vs. lower) RWSE levels. This is predicated on the idea that WCB, as a technology-induced stressor, can negatively impact on employees' physical and psychological well-being (Büchler et al., 2020). Because WCB compels employees to be constantly connected to internet-based devices during non-work hours, it has the potential to blur the lines between work and family domains, resulting in negative psychological or behavioral reactions (Singh et al., 2022). Worse, this increased use of technology is accompanied by feelings of information overload (Ragu-Nathan et al., 2008), which can cause significant delays in completing work-related tasks. Nevertheless, this is less likely to happen among employees who have a strong sense of RWSE. When confronted with work-life obstacles and difficulties, these employees are able to self-regulate and devise the most efficient means of completing a task (Tramontano et al., 2021). They are also predisposed to perceive obstacles as challenges rather than threats, which is a significant factor in their ability to persevere and stay the course. For this reason, it stands to reason that the positive indirect relationship between WCB and PAW via role stress will be weaker for employees with higher (vs. lower) RWSE levels.

Hypothesis 4: RWSE moderates the positive indirect relationship between WCB and PAW via role stress, such that this indirect relationship is weaker among employees with higher (vs. lower) RWSE levels.

3. Data and sample

Data were collected through Questionnaire Star and Credamo, two professional online survey platforms among Chinese researchers. China was deemed an appropriate context for our research because the central government had imposed strict COVID-19 restrictions, which limited public gatherings and forced many individuals to work from home. Thus, participants in the study included employees from various organizational units who worked remotely but had frequent interactions with their workplace. In this context, online surveys were the most effective data collection tools as it allowed respondents to provide information about their work-life experiences from any location and at their convenience.

In January 2021, we conducted a pilot study in which we distributed 57 questionnaires to eligible participants and received 43 valid responses from those who passed our quality control questions. Following that, our main study was conducted between March and September 2021, with data collected in two rounds. The six-month gap between rounds was essential for ensuring data integrity and reducing common method bias. It was also critical to ensure that participants could provide useful information about the nature of their social and psychological experiences while working from home. In both rounds, online ethical approval was obtained in accordance with the strict COVID-19 infection control measures implemented in the provinces where respondents resided. All participants received a cover letter outlining the purpose of the study and assuring them that their participation was entirely voluntary and their data would not be shared. A total of 415 questionnaires were completed from China's seven regions (north, northeast, east, south, central, southwest, and northwest), with 341 valid responses (82.17%).

3.1 Measures

Our survey instrument was originally designed in English and then translated into Chinese before data collection. Prior to data analysis, two professional translators were hired to backtranslate the data into English (Brislin, 1970). All items in the study were anchored on Likert-type scales using the same response formats as in previous research.

WCB was measured using He and Yu's (2020) three-item scale on electronic communication behavior during non-work hours. A sample item is: "During non-work time, my superiors, subordinates, coworkers or clients communicated with me for work via cellphone, email, QQ, WeChat and so forth" (Cronbach's alpha was 0.830).

Role stress was measured using the Chinese version of Li and Zhang's (2009) role stress scale. Role conflict consists of three items, such as "I often get involved in situations in which there are conflicting requirements"; role ambiguity consists of five reverse-coded items, such as "I know what my responsibilities are"; and role overload consists of five items, such as "My work load is too heavy" (Cronbach's alpha was 0.966).

RWSE was measured using the Chinese version of a sixteen-item scale developed by Staples et al. (1999). The scale was originally published in English and translated by Miao et al. (2015). These items were further adapted to fit the Chinese COVID-19 context (Cronbach's alpha 0.926).

PAW was measured using a scale developed by Metin et al. (2016). Soldiering was measured by eight items including "I take long coffee breaks", whereas cyberslacking was measured four items including "I read news online at work" (Cronbach's alpha was 0.973).

Control Variables. Following the precedents of previous management papers (e.g., Kelly et al., 2020; Moens et al., 2021; Ogonnaya et al., 2019b), we included eleven demographic and job characteristics as control variables. Around 58.1% of the sample was female, and 71% was married. The sampled respondents were mostly under 29 years old

(34.9%) and 30-39 years old (56%). In terms of the number of children, the majority (65.1%) had one child, while 33.4% had none. The percentage of participants with a bachelor's degree was 68.9%, with 63.6% having less than nine years working experience. Around 22.3% of the sample were from the manufacturing industry, while the top three occupational types were R&D (19.4%), marketing (12.9%), and administration (12.9%) (see Table 1 for more details on respondents' demographic information).

--Insert Table 1 here--

3.4 Validity and reliability of measures

We conducted the following tests to ensure the validity and reliability of our measures. First, an exploratory factor analysis validated our proposed four-factor model, with all measurement items loading appropriately above 0.60. The average variance extracted (AVE) values exceeded the 0.50 threshold, and the heterotrait-monotrait analysis of discriminant validity (Henseler et al., 2015) revealed that all ratios were below the 0.85 threshold.

Second, we conducted Harman's single-factor analysis, assuming that common method bias exists if the first factor explains more than 50% of the total variance (Podsakoff et al., 2003). The results of an exploratory factor analysis with principal axis factoring revealed that eigenvalues for all factors exceeded 1.0, and the first factor explained less than 50% of the overall variance. This suggests that common method bias was less likely an issue in our study. We also tested for common method bias using a full collinearity analysis (Kock, 2015), which revealed that the values for all variance inflation factors (VIFs) were significant below the 3.33 threshold. Following that, we performed skewness and kurtosis tests to verify our data were normally distributed. As shown in Table 2a, the skewness index of the four study variables was below within the 3.0 threshold, while the kurtosis index was below the 10.0 threshold (Tongo, 2015).

Third, confirmatory factor analysis was performed to ensure that all observed items were consistent with their underlying latent constructs. As expected, hypothesized four-factor model outperformed all other alternative models: $\chi^2 = 1374.66$, $df=878$, $\chi^2 / df = 1.566$, CFI=0.971, TLI=0.969, RMSEA=0.041, SRMR=0.0413. The model with the lowest performance was a single-factor model with all items loading on one latent construct (see Table 2b).

--Insert Tables 2a and 2b here--

4. Analysis and results

The descriptive statistics, as well as the validity and reliability of measures are presented in Tables 3a and 3b, whereas the correlations among study variables are presented in Table 4. WCB was positively associated with PAW ($r=0.143$, $p<0.01$) and role stress ($r=0.290$, $p<0.01$); role stress was positively associated with PAW ($r=0.267$, $p<0.01$); RWSE was negatively associated with role stress ($r=-0.318$, $p<0.01$) and PAW ($r=-0.443$, $p<0.01$); however, there was no significant correlation between WCB and RWSE ($r=0.073$, $p>0.05$).

--Insert Tables 3a, 3b and 4 here--

The PROCESS package (Hayes, 2012; 2018) was used to test hypothesized relationships, with the results shown in Tables 5–8. We used a hierarchical regression approach to examine our variables of interest in analytical blocks. Thus, in Model 1, we estimated the effects of the control variables on role stress to determine their confounding effects. In Model 2, we extended the previous model by including WCB as a predictor of role stress. Model 3 estimated the effects of the control variables on PAW, whereas Models 4 and 5 extend this model by including WCB and role stress as predictors, respectively. In Model 6, WCB and role stress were estimated simultaneously as predictors of PAW, alongside the control variables.

As shown in Table 5, WCB had a significant and positive relationship with PAW ($B=0.131$, $p<0.05$), indicating that excessive technology use outside of work hours increases the likelihood that employees will delay the completion of work-related tasks (full support for

Hypothesis 1). WCB was also significantly and positively associated with role stress ($B=0.300$, $p<0.001$), whereas role stress was significantly and positively associated with PAW ($B=0.278$, $p<0.01$). When WCB and role stress were examined simultaneously as predictors in Model 6, role stress had a significant and positive influence on PAW ($B=0.262$, $p<0.001$), whereas WCB's initial significant effect on PAW was lost ($B=0.052$, $p>0.05$). This fulfills the prerequisite for role stress to serve as a full mediator in our analysis. Furthermore, Table 6 shows that the index of indirect effects was significant and positive ($B = 0.109$, $SE = 0.033$, $95\% CI [0.051; 0.183]$); suggesting that role stress fully mediates the relationship between WCB and PAW (full support for Hypothesis 2).

--Insert Tables 5 and 6 here--

We examined the moderated effects using the same hierarchical regression approach. Models 7 and 8 were similar to Models 3 and 5, respectively, whereas Model 9 extends the preceding model by estimating WCB and the moderator (i.e., RWSE) as predictors of PAW. In Model 10, we then included an interaction term between WCB and RWSE to examine the un-hypothesized impact of RWSE as a first-stage moderator. Following that, Model 11 estimated WCB, role stress, and RWSE as predictors of PAW, whereas Model 12 added an interaction term between role stress and RWSE as a test for Hypothesis 3.

As reported in Table 7, the interaction between role stress and RWSE had a significant and negative impact on PAW ($B=-0.393$, $p<0.001$), suggesting that employees with a strong sense of RWSE are less likely to procrastinate or delay completing work-related tasks when faced with work-life stress (full support for Hypothesis 3). Furthermore, Table 8 shows the index of moderated-mediation was significant and negative ($B = -0.307$, $SE = 0.077$, $95\% CI [-0.470; -0.171]$), implying that the positive indirect relationship between WCB and PAW via role stress was significantly weaker among employees with higher (vs. lower) RWSE levels

(full support for Hypothesis 4). In Figures 2a and 2b, we graphically depict the nature of RWSE's moderating role at one standard deviation below and above the mean value.

--Insert Tables 7 and 8 here--

--Insert Figures 2a and 2b here--

5. Discussion

During the COVID-19 pandemic, employees in China and elsewhere were forced to work from home, resulting in WCB and various forms of compulsive connectivity to internet-based platforms. Recent studies (e.g., He and Yu, 2020; Singh et al., 2022) have acknowledged this pattern of behavior, with evidence suggesting major consequences for their personal and professional lives. Using role stress theory, we sought to extend prior research by examining the influence of WCB on PAW in the COVID-19 context, as well as the importance of role stress as a mediating mechanism. We also examined the importance of RMSE as a condition for determining when the indirect influence of WCB on PAW may be more or less pronounced for some employees. All hypothesized relationships were supported by data from Chinese teleworkers. Specifically, employees who engaged in WCB were more likely to procrastinate or delay the completion of work-related tasks, and this behavioral pattern was explained by their exposure to role stress. However, for employees with a strong sense of RWSE, this was less likely the case. Higher levels of RWSE meant that employees were better equipped to self-regulate and devise more efficient means of completing work-related tasks when confronted with work-life challenges (Tramontano et al., 2021).

From a theoretical standpoint, our findings contribute to the existing literature by demonstrating an important stress-based mechanism between WCB and PAW. The COVID-19 pandemic ushered in a cultural shift in which digital forms of working have become the new norm (Adisa et al., 2021; He and Yu, 2020). Consequently, many organizations upgraded their technological systems and integrated various internet-based platforms into their employees'

daily work routines. While these systems enabled some employees to be more flexible and adaptable at work, others developed an unhealthy obsession with technology use at the expense of their mental health and psychological well-being (Singh et al., 2022). Our findings indicate that this behavior blurs the line between employees' work and family life, thereby impairing their ability to complete work-related tasks effectively. In this instance, some employees attempted to alleviate the pressure of "always being on online" by soldiering, such as delaying task completion, taking extended tea breaks, and surfing the internet during work hours. Others engaged in cyberslacking by using their employer-provided digital resources for non-work-related activities. These theoretical insights offer new knowledge on what organizations should be aware of regarding technology use and remote work in today's post-pandemic era.

According to our review of the WCB literature, the majority of studies have concentrated on how it influences social and psychological outcomes in the work-life domain (e.g., Derks et al., 2014; Schlachter et al., 2018; Singh et al., 2022). These studies generally agree that excessive connectivity to digital devices outside of work hours generates incompatible demands between employees' work and family roles, making the execution of work-related tasks more challenging. In the current study, we investigate this phenomenon in greater depth, focusing on role stress as the mediator between WCB and PAW. We found evidence that working from home and engaging in WCB increases employees' stress levels and makes it difficult for them to self-regulate. Because this situation can also result in more psychological strain on employees' mental health, they are more likely to feel demoralized and resort to procrastination as a coping mechanism. In this light, our findings corroborate claims that, due to the pandemic and its associated mental health repercussions, teleworkers have had a greater exposure to role stress (Kniffin et al., 2020). Also, in the absence of adequate levels of support, this stressful experience can potentially reduce their productivity and contribute to delays in completing work-related tasks on time.

Another theoretical contribution of the present study is our finding that RWSE plays an important role in moderating the indirect links between WCB and PAW via role stress. This finding is consistent with prior research suggesting that self-efficacy as an individual resource could help employees manage the psychological pressure or tension associated with balancing work and family roles (Singh et al., 2022). Additionally, Mihalca et al. (2021) argued that self-efficacy plays a key role as an effective buffer against the fear and anxiety associated with by a life-threatening situation. Expanding on these results, our research indicates that employees with a strong sense of RWSE are more likely to feel in control of their emotions, making it easier for them to persevere when threatened or under pressure. This characteristic is especially advantageous for teleworkers, as it allows them to maximize the benefits of working remotely while balancing the demands of their work and family roles. Thus, while WCB could have a negative impact on employees' physical and psychological well-being, our research suggests that this experience is less likely pronounced for employees with high levels of RWSE. These employees are typically more confident in their abilities to forge ahead and stay the course, despite the negative consequences of WCB and role stress.

6. Managerial implication

Our study has a variety of practical implications, ranging from how organizations can more effectively implement remote work practices to how they can mitigate the stressful experiences caused by excessive technology use. First, organizations that offer teleworking opportunities should provide employees with adequate levels of support, allowing them to effectively balance the demands of their work and family roles. They should also modify their performance management practices and compensation schemes (Ogbonnaya et al., 2017), which will discourage employees from being constantly connected to the internet. For instance, new policies can be enacted requiring employees to refrain from responding to work-related emails and participating in internet-based video calls at night or after a certain time when core

business activities have concluded. With such policies in place, employees can avoid WCB and spend fewer hours on internet-based platforms during non-work hours. This can also have positive consequences for their physical and mental health, allowing them feel more satisfied with their jobs and complete work-related tasks on time. Line managers and HR departments would also need to re-evaluate employees' workloads, with a particular emphasis on adjusting their working patterns and establishing relevant systems to limit constant connectivity to internet-based platforms.

Second, organizations should strive to improve the quality of their employees' jobs by clarifying tasks and reducing ambiguity in performance expectations (Daniels et al., 2018). To do so, line managers and HR departments should ensure that employees' job descriptions are well-defined and all organization-wide digital platforms are seamless or user-friendly. In addition, it is essential that employees receive skill-enhancement training and are made aware of any resources that can assist them in effectively managing their time when using digital systems. Doing so will help reduce what researchers refer to as techno-complexity, a stressor that arises when employees are constantly required to learn how to use new technological systems (Ragu-Nathan et al., 2008; Singh et al., 2022; Tarafdar et al., 2019). Providing adequate training and clarifying performance expectations for employees will make a difference in addressing role ambiguity and the associated counterproductive behaviors. Moreover, to tackle role conflict and role overload, it is important to provide employees with a level of autonomy that enables them to balance their work and family lives. This entails giving employees the freedom to decide how and when to carry out their jobs without being micromanaged by line managers (Ogbonnaya and Valizade, 2015; Wood et al., 2020).

7. Limitations and recommendations for future research

Despite the theoretical and practical significance of our findings, the present study has a number of noteworthy limitations. First, though our research design comprised two rounds

of data collection, the use of self-reported data limits our ability to draw inferences of a causal nature (Metin et al., 2018; Mihalca et al., 2021). In light of this, research (e.g., Ogbonnaya et al., 2022c) proposes alternative analytical designs, such as randomized controlled trials, to facilitate causal inferences pertaining to the direct and indirect links between WCB and work-related outcomes. Second, data on PAW were collected solely from employees, making our findings susceptible to social desirability bias (Larson, 2018). Nonetheless, previous research on procrastination has shown that self-reported measures can be as reliable as those derived from multiple sources (Krause and Freund, 2014; Hen et al., 2021). Furthermore, our tests for common method bias confirmed our data's reliability, though we caution against generalizing our findings beyond their limitations.

The third limitation is that the current study relied solely on the mainstream assumption that PAW is a negative behavior resulting primarily from an individual's failure of self-regulate. However, we must acknowledge that other perspectives on PAW suggest that individuals may deliberately engage in this pattern of behavior to spite the organization or to protest what they perceive as unfair treatment (Nie et al., 2020; Kim et al., 2021). Recognizing this possibility, we propose that future research investigates the various contributing factors to procrastination so as to better comprehend them. Fourth, our research was limited to the Chinese context, restricting its generalizability to other cultural contexts where employees were compelled to work from home due to COVID-19 restrictions. Therefore, additional research on employees' experiences and reactions to WCB in other cultural contexts would represent a significant advancement in the field.

8. Conclusions

Due to the COVID-19 crisis, many employees have developed the unhealthy habit of staying constantly connected to digital devices as part of their jobs. The present study examined how this pattern of behavior, known as WCB, induces employees to procrastinate or delay the

completion of work-related tasks. Our findings resulted in three main conclusions. First, the more employees engage in excessive technology use during non-work hours, the more likely it is that PAW will occur. This could be due to self-regulation failure, in which employees' mental and physical energy is depleted, prompting them to put off completing work-related tasks. Second, when faced with WCB as a stressor, employees are more likely to experience role stress, which exacerbates PAW. In other words, WCB may contribute to PAW indirectly via role stress (comprising role overload, role ambiguity and role conflict). Third, employees with a strong sense of RWSE are better equipped to tackle difficult tasks and shift their focus away from personal failings, which is important in mitigating the negative consequences of WCB and role stress.

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Table 1. Sample Description

Type	Options	Rate%	Type	Options	Rate%	Type	Options	Rate%
Gender	Male	41.9	Professional Title	Primary	48.7	Work Type	Financial	10.3
	Female	58.1		Medium	39.0		Production	9.7
Age	≤29	34.9		Associate Senior	8.5		Marketing	12.9
	30-39	56.0		Senior	2.3		Educational	7.0
	40-49	7.6		Missing Data	1.5		R & D	19.4
	50-59	1.2		General Staff	41.3		Administration	12.6
Marital Status	Unmarried	29.0	Position Level	Junior Manager	36.4	Organizational Nature	HR	7.6
	Married	71.0		Middle Manager	17.6		Planning	4.7
Number of Resident Children	0	33.4		Senior Manager	4.4		Design	7.6
	1	65.1		Missing Data	.3		Legal	1.5
	2	1.2		IT	18.5		Information	3.5
Education Level	≥3	.3		Financial	7.0		Others	3.2
	High School or Less	3.2	Construction/Real state	9.4	Private Enterprise	51.0		
	Junior College	8.2	Consumable	5.0	National Enterprise	24.6		
	Bachelor	68.9	Education/Training	8.5	Joint Venture Enterprise	11.4		
	Master	18.2	Industry	Cultural/Media	6.2	Government and Public Institutions	12.6	
	PhD	1.5		Medical & Health	3.5	Others	.4	
≤9 years	63.6	Manufacturing		22.3				
10-19	29.9	Government		2.1				
Seniority	20-29	4.4	Public Institution	5.9				
	30-39 years	1.5	Service	6.5				
	Missing data	.6	Energy/Chemical	4.7				
			Others	.4				

Note. N=341.

Table 2a. Skewness and Kurtosis Tests

	N	Range	Minimum	Maximum	Mean	SD	Variance	Skewness	Kurtosis			
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. error	Statistic	Statistic	Statistic			
								Std. error	Std. error			
WCB	341	3.67	1.33	5.00	3.6979	.03429	.63323	.401	-.154	.132	.049	.263
RWSE	341	2.94	2.06	5.00	4.1518	.02441	.45084	.203	-1.814	.132	5.131	.263
PAW	341	4.83	1.58	6.42	3.6144	.04757	.87846	.772	.759	.132	.928	.263
Role stress	341	3.92	1.08	5.00	3.0889	.05310	.98055	.961	.001	.132	-1.060	.263
Valid N (listwise)	341											

Table 2b. Result of Confirmatory Factor Analysis

Model	χ^2	df	χ^2 / df	CFI	TLI	RMSEA	SRMR
Four-Factor Model (Raw Model)	1374.662	878	1.566	0.971	0.969	0.041	0.0413
Three-Factor Model 1	7608.402	901	8.444	0.612	0.593	0.148	0.1482
Three-Factor Model 2	5805.590	899	6.458	0.716	0.702	0.127	0.0845
Three-Factor Model 3	10939.370	899	12.168	0.420	0.389	0.181	0.1924
Two-Factor Mode 1	7926.663	901	8.798	0.594	0.574	0.151	0.1790
Two-Factor Mode 2	7608.402	901	8.444	0.612	0.593	0.148	0.1482
One-Factor Model	11501.346	902	12.751	0.387	0.358	0.186	0.2282

Note. N=341. Four-Factor Model: Work Connectivity Behavior, Role stress, Remote Work Self-Efficacy, Procrastination At Work; Three-Factor Model 1: Work Connectivity Behavior + Role stress, Remote Work Self-Efficacy, Procrastination At Work; Three-Factor Model 2: Work Connectivity Behavior, Role stress + Remote Work Self-Efficacy, Procrastination At Work; Three-Factor Model 3: Work Connectivity Behavior, Remote Work Self-Efficacy, Role stress + Procrastination At Work; Two-Factor Model 1: Work Connectivity Behavior + Procrastination At Work, Role stress + Remote Work Self-Efficacy; Two-Factor Model 2: Work Connectivity Behavior + Role stress, Remote Work Self-Efficacy+Procrastination At Work; One-Factor Model: Work Connectivity Behavior + Role stress + Remote Work Self-Efficacy + Procrastination At Work.

Table 3a. Descriptive Statistics

Variable	Reliability	KMO	Convergent Validity	
	Cronbach's α		AVE	CR
1. WCB	0.830	0.726	0.7549	0.9023
2. Role stress (RS)	0.966	0.951	0.7174	0.9705
3. RWSE	0.926	0.953	0.4789	0.9361
4. PAW	0.960	0.956	0.8784	0.9886

Note: N=341.

Table 3b. HTMT values

Average Heterotrait-Heteromethod		Product of Average Monotrait-Heteromethod			HTMT
		Index	Result	Square Root	
WCB,PAW	0.106	WCB*PAW	0.450	0.671	0.158
WCB,RS	0.210	WCB*RS	0.431	0.657	0.320
WCB,TE	0.119	WCB*TE	0.280	0.529	0.225
RS,PAW	0.198	RS*PAW	0.485	0.696	0.284
PAW,TE	0.269	PAW*TE	0.315	0.561	0.479
TE,RS	0.185	TE*RS	0.302	0.550	0.337

Table 4. Means, Standard Deviations and Correlations among Study Variables

Variable	1	2	3	4
1. WCB	0.869			
2. Role stress (RS)	0.290**	0.847		
3. RWSE	0.073	-.318**	0.692	
4. PAW	0.143**	0.267**	-0.443**	0.937
Mean	3.698	3.089	4.152	3.614
Standard Deviation	0.633	0.981	0.451	0.878

Note: N=341; *** represents $p < 0.001$, ** is $p < 0.01$, * is $p < 0.05$; numerical values on the diagonal are square root of the average variance extracted (AVE); and the data below is the correlation coefficient of each latent variable.

Table 5. Regression Coefficients for Main and Mediation Effects

Type of Variables	Variable	Role stress (RS)		Procrastination at Work (PAW)			
		Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Control Variable	Age	.092	.057	.258**	.243**	.233**	.228**
	Industry	.114*	.121*	-.002	.001	-.034	-.031
	Position	.007	.023	.013	.020	.011	.014
	Professional Title	-.017	-.035	.055	.048	.060	.057
	Education	.151**	.149**	-.011	-.012	-.054	-.051
	Organization	.156**	.126*	.000	-.013	-.043	-.046
	Gender	-.021	-.016	-.014	-.012	-.008	-.008
	Position Level	-.121	-.112	-.195**	-.192**	-.162*	-.162*
	Marital	-.123	-.151	.034	.021	.068	.061
	Children	-.025	-.021	-.008	-.006	-.001	-.001
Independent Variable	Seniority	.054	.028	-.155	-.167*	-.170*	-.174*
	WCB		.300***		.131*		.052
Mediator	RS					.278**	.262***
	R ²	.098	.180	.052	.068	.122	.124
	ΔR ²	.098	.082	.052	.016	.070	.056
	F	3.235***	5.994***	1.645	1.987*	3.786***	3.558***
	VIF	-	1.096	-	1.096	1.219	1.108

Note: N=341; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$; the data of this table is the standardized regression coefficient.

Table 6. Index of Mediation

	Effect	BootSE	BootLLCI	BootULCI	Proportion
Indirect Effect	0.109	0.033	0.051	0.183	60.06%
Direct Effect	0.073	0.081	-0.093	0.231	39.94%
Total Effect	0.182	0.115	1.046	1.494	100%

Note: N=341; the data of this table is the standardized regression coefficient.

Table 7. Regression Coefficients for Moderation Models

Type	Variable	Procrastination at Work (PAW)					
		Model 7	Model 8	Model 9	Model 10	Model 11	Model 12
Control Variable	Age	.258**	.243**	.219**	.222**	.215**	.178
	Industry	-.002	.001	-.009	.004	-.022	.006
	Position	.013	.020	-.015	-.002	-.015	-.013
	Professional Title	.055	.048	.073	.079	.075	.059
	Education	-.011	-.012	-.014	-.022	-.030	-.014
	Organization	.000	-.013	-.050	-.079	-.061	-.095*
	Gender	-.014	-.012	.015	-.001	.014	-.017
	Position Level	-.195**	-.192**	-.155*	-.154*	-.145*	-.140*
	Marital	.034	.021	.018	-.009	.035	.036
	Children	-.008	-.006	.016	.036	.017	.049
Independent Variable	Seniority	-.155	-.167*	-.135	-.120	-.140*	-.140*
	WCB		.131*	.158**	.193***	.123*	.080
	Role stress (RS)					.110*	.259***
Mediator							
Moderator	RWSE			-.454***	-.435***	-.420***	-.189**
	WCB* RWSE				-.220***		
Interaction	RS* RWSE						-.393***
	R ²	.052	.068	.265	.310	.273	.374
	ΔR ²	.052	.068	.213	.045	.206	.101
	F	1.645	1.987*	9.054***	10.440***	8.763***	12.952***
	VIF	-	1.096	1.044	1.046	1.044	1.032

Note: N=341; * for p less than 0.05, ** for p less than 0.01, *** for p less than 0.001

Table 8. Index of Moderated Mediation

	Index	BootSE	BootLLCI	BootULCI
TE	-0.307	0.077	-0.470	-0.171

Note: N=341

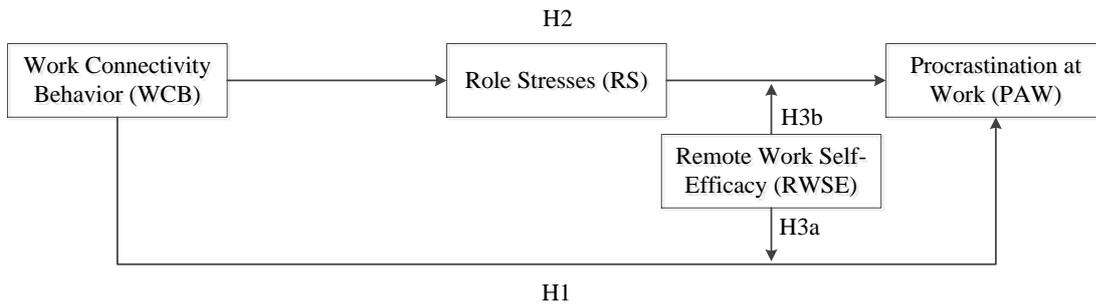
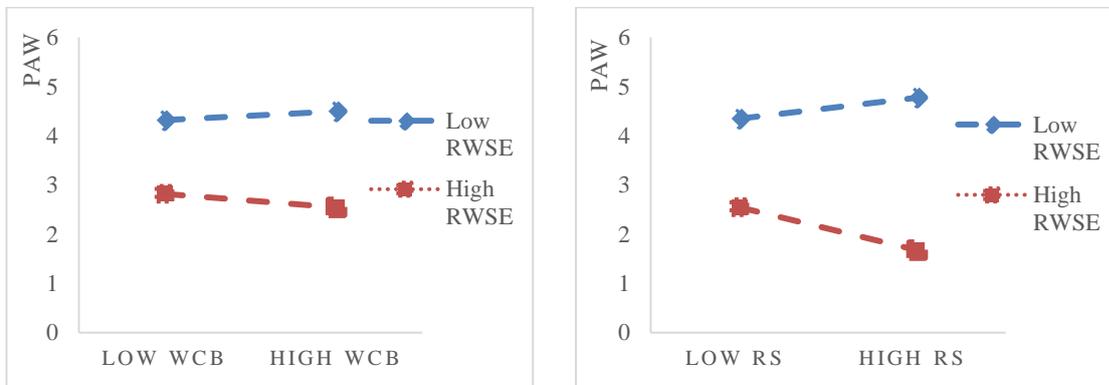


Figure 1 Theoretical Model of this study



(2a) Moderating effect of RWSE on the relationship between WCB and PAW

(2b) Moderating effect of RWSE on the relationship between RS and PAW

Figure 2. Moderating Effect of Remote Work Self-Efficacy (RWSE)