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How mobile instant messaging affects public employees' daily work: An empirical examination based on stressor-strain-outcome model

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Completed Research Paper

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Abstract

The phenomenon of excessive instant messaging usage in the workplace has garnered increasing attention in recent years. Despite its pervasiveness, extant literature predominantly focused on the psychological well-being, with the subsequent influences on work performance remaining largely unexplored. Using data from street-level bureaus in China, this study examines how work-oriented mobile instant messaging stressors result in psychological reactions and daily work performance decrement as well. Results demonstrate that information overload, compulsive usage and normative response pressure are significant predictors of strain which was represented by cognitive fatigue, emotional fatigue and invasion of life. These strain constructs can further impair individual's work performance. The findings from this research provide meaningful theoretical insights and carry practical implications.

Keywords: mobile instant messaging, stressor-strain-outcome model, public employees, work performance decrement

Introduction

Mobile Instant Messaging has gradually emerged as a dominant collaboration tool throughout Chinese workplace (Zheng & Davison, 2022). Existing work-oriented social media platforms can be roughly separated into two groups. One of which is derived from social media platforms in private sphere, such as WeChat, QQ. Because of the large user base and strong power of coordination across devices, these sorts of applications were gradually transferred for work context to some extent. The second group was those exclusively designed enterprise social media platforms with more functionalities and better compatibility. Dingtalk and WeCom (WeChat corporate version) are typical examples. Office workers were reported to extensively rely on WeChat to collaborate with their colleagues and exchange files rather than using emails

(Sahut & Lissillour, 2023). Likewise, DingTalk were widely-accepted in schools (Zhang et al., 2023), administrative agencies (Yang, 2020), etc. In this context, we regard these social media applications are work-oriented mobile instant messaging (WOMIM). Prior literature has acknowledged the positive effects of WOMIMs that work flexibility and efficiency were boosted, and more autonomy was endowed to the employees. Nevertheless, these platforms have dramatically changed employees' working styles by crafting a 24hours availability. By freeing the physical boundary and creating a pervasively connected virtual workplace, employees are more susceptible to stress-related occupation risks. Researches regarding the adverse impacts of inappropriate WOMIM usage on employees were relatively scarce. It has been evidenced that technology-induced stress is entwined with individuals' fatigue (Cao et al., 2020; Sun & Lee, 2021) and psychological state of exhaustion (Maier et al., 2015), resulting in a series of counterproductivity problems (Shu et al., 2011; Tarafdar et al., 2007). Over-attachment to WOMIM makes employees be continuously message-responsive and always available for work-related requests, their psychological well-being is likely to be undermined, and their work performance may be impaired as well. To this end, this study aims to investigate the negative effects of WOMIM-related stressor on individuals' psychological reactions and final work performance.

With the retrospect of extant literature, much space in this area remains obscure. For instance, a great deal of prior research mainly adopted one single affectively-aroused strain (i.e., social media fatigue, exhaustion) (Guo et al., 2020; Kim et al., 2015; Luqman et al., 2017; Shi et al., 2020) to explain the adverse effects on behavioral outcomes which is not sufficient. It has been neglected that stressful situations can raise emotional fatigue and cognitive fatigue simultaneously (Ilies et al., 2015; McMorris et al., 2018). Though mental fatigue has been verified its significant effects on following task productivity (McMorris et al., 2018), their relationships were less elucidated in IS except for a very recent study by Hwang (Hwang et al., 2020). They proved that cognitive fatigue was negatively associated with employees' job engagement, while further investigation is still needed. In parallel with studies on social media fatigue, organizational sciences subject has concluded several crucial contributors to email-enabled stress (Stich et al., 2019), one of which is correspondent's response expectation. When swift response activity is expected and encouraged by organizations, extensively engaged on instant messaging will undoubtedly contribute to employees' work strain. In a similar vein, Jerejian (Jerejian et al., 2013) posited that academics who tackle the high email volume deepen their stress feelings. Keeping this in mind, we argue that employees' swift response to work messages, which can even exacerbate their strain. Nevertheless, no prior research on this relatively novel topic has been conducted as far as we know. The present study, as a result, suspects that normative response pressure in the WOMIM context serves as an essential factor in relation to strain and work performance, calling upon deeper inspection.

To fill up the existing gap, the current study builds the conceptual model founded upon Stressor-Strain-Outcome (SSO) framework and integrates with some critical aspects from the organizational behavior discipline. SSO has been well-documented and confirmed its effectiveness in understanding stress-related behavior (Dhir et al., 2019; Lee et al., 2016). As such, we grounded our research on SSO. Our findings can contribute to the existing literature on technostress in three major ways. First, we look at cognitive fatigue and identify its importance as a representative of strain. We find that cognitive fatigue caused by information overload can positively predict poor work performance, enriching research on stress-related occupation risks a great deal. Second, based on evidence from email-stress works, the manuscript advances the current social media literature by adopting normative beliefs into stress-related phenomenon understanding. It helps provide a more comprehensive view of the interaction between employees within organizations and the pertinent IT infrastructures. Third, we particularly focus on the adverse effects of ubiquitous WOMIM on the workforce in public sectors, which is a less investigated population in IS. When it comes to WOMIM use, benefits were typically thought to surpass disadvantages (Ou & Davison, 2011). Until recently, several studies have contended the unfavorable outcomes resulting from social media use for work purposes in Chinese public sectors (Li & Wang, 2022; Wang & Li, 2023). Empirical studies targeting on comprehending adverse effects were, however, still at the infant stage. Particularly, public employees are expected to become highly accountable to citizens and their fellow colleagues, they also utilize social media to improve the public service quality (Mergel, 2013). WOMIM is regarded as an essential tool for them to execute duties and maintain communications with citizens. Along with the overattachment to WOMIM, their well-being is likely to be suffered accordingly. We anticipate that our study can attract more attention toward this knowledge lacuna as well as the target respondents.

The remainder of the manuscript is structured as follows. The theoretical foundation are reviewed in Section Two. We then develop our research model and articulate the corresponding hypotheses in Section Three. After that, the methodology and model testing results were presented in Section Four. The data analysis results are presented in Section Five. In the last section, we discuss our key findings, theoretical and practical implications.

Theoretical foundation

Stressors: information overload, compulsive usage and normative response pressure

The SSO paradigm describes the associations among environment-stimulated stressors, psychological strain, and subsequently behavioral outcomes, which were initially presented by Koeske (Koeske & Koeske, 1993). Obviously, the SSO framework consists of three components: stressor, strain, and outcome. Within the Information and Communication Technology (ICT) context, a plethora of studies have deemed information overload as the paramount reason for stress (Hwang et al., 2020; Shi et al., 2020; Thomée et al., 2007). Unlike prior literature, we depict that the vast volume of information users received is not solely triggered by their social communication with their families or acquaintances on instant messaging, and it is also determined by how work flow is formulated in contemporary digital society. WOMIMs facilitate instant communication among colleagues, disseminate announcements immediately, and exchange documents across PCs and mobiles. As such, information overload appears to be more destructive, serving as an unavoidable source of stress. Drawing upon the preceding discussion, we first include information overload and tailor its conception to our context.

Compulsive usage has also received much attention in the body of social media studies with a consensus that it's a side effect of social media excessive usage (Apaolaza et al., 2019). Compulsive usage as unintentionally repetitive behavior (Wang & Lee, 2020) indicate individuals' periodic monitoring of their mobile instant messengers in an abnormality way, which can raise psychological and biological issues (James et al., 2017). The effects of compulsive usage on users' mental strain has been corroborated by extant literature. For example, Hiso (Hsiao et al., 2017) empirically validated that compulsive usage predicts technostress. In our context, constantly checking work-related messages originates from WOMIM's indispensable role in employees' daily routines, which in turn contribute to developing their compulsive use. We thus adopt compulsive usage as the second stressor.

Public sectors in Eastern cultures are surrounded by a climate where employees' performance evaluation is largely subjective, leaving space for bias and discretion by their supervisors (Zhang et al., 2022; de Janvry et al., 2023). In this sense, we prudently presume that this sort of organizational structure could engender employees to experience strong organizational norms, particularly in public sectors. In support of this argument, research has established that organizational norms have potent influence on public employees' behavior, such as rule bending (Borry, 2017), and knowledge-sharing (Jarrahi & Sawyer, 2015). In our context, when employees host beliefs that they need to be continuously available on social media even after work hours, their extensive usage is not their innate willingness but to satisfy others' expectations and for maintaining their job security. Evidence has shown that email response pressure can cause work strain (Brown et al., 2014), we thus expect a similar pattern that norms of swift responses can also occur in the WOMIM context. For this reason, normative response pressure while using WOMIM is the last stressor.

Strain: Emotional fatigue, cognitive fatigue, and invasion of life

Strain means unconsciously psychological (de Croon et al., 2004) or physiological (Spector & Jex, 1998) status in response to stressors. By reviewing the extant literature, we found that researchers normally use fatigue as a proxy of strain in social media studies. Social media fatigue, coupled with information overload, were operationalized to explain social media passive usage behavior (Li et al., 2021), discontinuous behavior (Asim Nawaz et al., 2018; Fu et al., 2020), and poor academic performance (Cao et al., 2018). Fatigue itself, however, is a multidimensional construct (de Vries et al., 2003), and prior studies have failed to explain the different impacts of emotional fatigue and cognitive (mental) fatigue on work performance accordingly. Without this understanding, it is difficult to identify the underlying mechanism of WOMIM-induced stress since processing information is involved with individuals' cognitive loads. Therefore, research that explores

the cognitive dimension of fatigue and the potential impacts on employees is urgent. We introduce emotional fatigue and cognitive fatigue as two dimensions to capture general fatigue toward WOMIM. Cognitive fatigue characterizes the feelings of cognitive exhaustion, leading to difficulty in thinking, searching, and remembering activities (Hwang et al., 2020). While emotional fatigue refers to the emotional frustration due to intensively engagement on WOMIM for work issues.

Benefiting from the advancement of MIM in synchronous communication, the working flexibility has been increased while the working boundary has been extended meanwhile. Due to the pervasive connectivity enabled by WOMIM, private activities have been compromised, and the boundary between work and private spheres has been blurred. Life invasion is a psychological strain wherein the employee's personal life is being invaded by work-related messages (tasks). Life invasion normally appears after cumulative ICT usage experience and may take long time to develop. In this regard, we embrace life invasion in our model as a strain and assume it can further affect work performance.

Outcome

Declined productivity has been identified as the main adverse consequence of psychological stress aroused by prolonged exposure to social media applications. In examining human performance, researchers in the educational context commonly use the overall grades to represent academic results. Occupational researchers adopted job engagement (Hwang et al., 2020) or job performance (Yu et al., 2018) as the target construct so as to explain stress-induced counterproductivity behavior. Nevertheless, in this study, we utilize a more accurate measure, namely, work performance decrement serving as our model's behavioral consequence. Compared to previous studies, work performance decrement can explicitly measure the adverse impact of employees' psychological disturbance arising from WOMIM over-attachment on their following task quality, which was supposed to be more suitable for our understanding.

Research model and Hypothesis development

Linking Stressors to Strain

Information overload

It was acknowledged that humans have limited processing capability. Information overload occurs when the amount of data far exceeds users' processing capability, and stress feeling is developed in this approach. With the users' stressful perceptions sustained, the employee is more likely to feel fatigued, exhausted, depressed, tc.. The linkage between information overload and emotional fatigue has been adequately and clearly demonstrated so far (Li et al., 2021; Qaisar et al., 2021; Whelan & Islam, 2020). Additionally, Using instant messaging for work purpose involves many cognitive activities, for example, checking information, and gathering information via communications with colleagues. Indeed, there is empirical evidence exhibiting that cognitive burden surfaces when office workers cope with high information load (Cao & Yu, 2019), and thereby Information overload incur cognitive fatigue (Hwang et al., 2020). On the basis of the above discussion, we hypothesize the following:

H1a: Information overload positively influences emotional fatigue.

H1b: Information overload positively influences cognitive fatigue.

Compulsive usage

The impacts of compulsive usage on social media-induced fatigue have also been probed previously (Dhir et al., 2018; Pang, 2021). Researchers suggest that compulsive technology use can be driven by keeping texting and reading messages without control (Bayer & Campbell, 2012; Clements & Boyle, 2018), which results in discomfort, and emotional fatigue (Oberst et al., 2017; Pontes, 2017). Constantly using WOMIM helps develop a work routine, while habitually checking notifications on WOMIM will ultimately enhance users' contradictory experience that they are unable to detach their personal life from work schemes on mobile phones. Users are prone to be distracted from offline tasks once this compulsive technology interaction has been established. In this manner, employees are more likely to feel that their personal life was invaded. Additionally, WeChat is a hybrid platform that includes both work-related use and personal-

related use (Cao & Sun, 2018; Chaouali, 2016). Unintentionally and uncontrollable checking behavior particularly outside the regular working time could even exacerbate the feeling of vague boundaries and imbalanced work-life relationships. We presume that over-attachment to WOMIM can help develop compulsive social media interaction habit, which interrupts regular daily life. It is possible to propose that obsessive usage of WOMIM may cause feelings of personal life invasion. We therefore hypothesize:

H2a: Compulsive usage positively influences emotional fatigue.

H2b: Compulsive usage positively influences invasion of life.

Normative response pressure

Whether normative response pressure can predict life invasion perception has been studied less often. Still, some clues can be gleaned from occupational psychology literature. Researchers have asserted that employees' willingness toward continuous availability for work is largely influenced by their interaction with social groups such as peers and supervisors (Cialdini & Goldstein, 2004; Morris, 2000). It is likely that public employees feel an obligation to maintain their responsiveness even for non-work time (Derks et al., 2015). WOMIM provides the possibility that organizations have more control over employees outside regular office hours, allowing work to intrude into the non-work realm. In dealing with a high amount of work-related requests on WOMIM, public employees who obsess with high organizational communication norms will experience strong feeling of life invasion, because they cannot just suspend those messages and they need to reply as the organization expected. We argue that, using WOMIM for 24hours staying connected, giving swift responses to ongoing work issues during leisure time, will draw employees into a struggling dilemma where their lives are more severely invaded. Hence:

H3: Normative response pressure positively influences invasion of life.

Linking Strain to Outcome

Substantial studies have confirmed that fatigue was positively correlated with academic performance decrement (Dhir et al., 2019; Malik et al., 2021). This study goes further and considers the possibility that different dimensions of fatigue may affect later productivity at the very same time, uncovering the reasons for poor performance more precisely and specifically. Jialin (Jialin & Andrew, 2017) pointed out that the heavy mental workload increases fatigue and further results in reduced functional capacity. (Luqman et al., 2020) argued that depletion in cognitive function can diminish academic performance. On the basis of these facts, the present study assumes that on experiencing cognitive exhaustion and emotional exhaustion, employees are likely to adversely perform on their other routine tasks. Moreover, Cao (Cao et al., 2018) proved that life invasion is negatively associated with academia performance, we then suppose that there is a potential association between increased life invasion and decremental work performance. Taken together, it could be argued that life invasion feelings render employees in a quandary where less leisure time can be utilized due to the prolonged accessibly on instant messaging, decreasing their following task efficiency. Thus, the article predicts that:

H4a: Cognitive fatigue positively influences work performance decrement.

H4b: Emotional fatigue positively influences work performance decrement.

H4c: Invasion of life positively influences work performance decrement.

The research model proposed are illustrated in Figure 1.

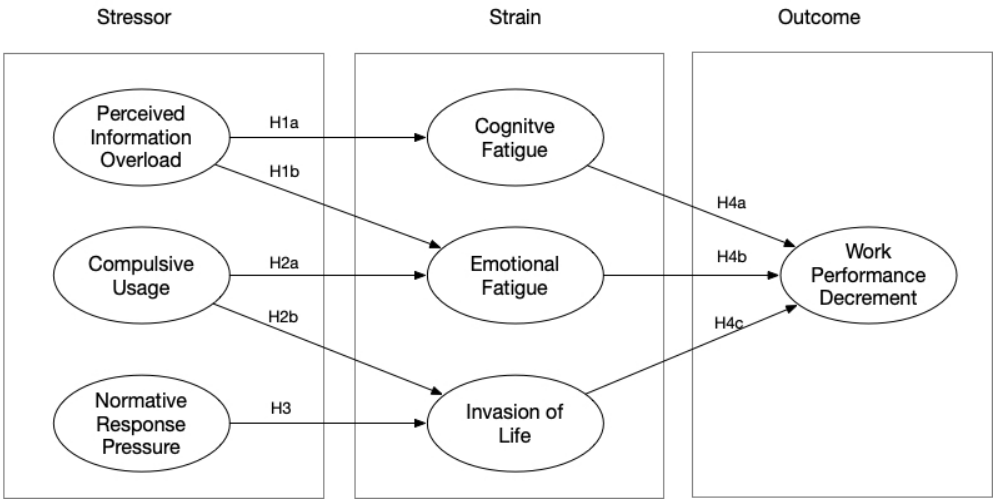

Figure 1. Research Model

Methodology

Measurement development

Survey method was used in the current work. We began by reviewing existing literature to identify previously validated scales. The items of perceived information overload and cognitive fatigue were adapted from Hwang (Hwang et al., 2020). The scales of compulsive usage were adapted from Lee (Lee et al., 2016). The items of emotional fatigue were adapted from Zhang (Zhang et al., 2021) and Xiao (Xiao & Mou, 2019). The invasion of life were adapted from Lee (Lee et al., 2016) and Xiao (Xiao & Mou, 2019). The normative response pressure were adapted from Brown (Brown, 2014) and Huigang (Huigang et al, 2007). The work performance decrement were adapted from Malik (Malik et al., 2021). As the original measurement items were in English, the back-translation method was used to convert the original English versions to Chinese. To ensure readability and clarity, we invited three postdoctoral researchers to examine the questionnaire. Several items were corrected in expression since the words such as fatigue and strain are interchangeable in Chinese and may lead to respondents' confusion. We paid attention to the wording style and aimed to transform the technical expressions to appropriate contextual-related expressions (Grant & Davis, 1997). In the follow-up process, a pilot study was conducted on 20 students. Some minor revisions are made based on the feedback from the pilot study. All items were anchored on a 5-point Likert scale (1 = strongly disagree; 5 = strongly agree).

Sample and procedures

The data collection process involved two waves. Firstly, in later November 2021, we recruited students enrolled in part-time MPA programs in two research universities in Jiangsu Province, China. All of them are occupied as civil servants serving at street-level bureaus. Social media platforms that can be used for collaboration such as WeChat and QQ, and specific channel-based communication tools such as the Enterprise version of WeChat (WeCom) and DingTalk are considered as our target WOMIMs. We then asked them whether they use any one of these WOMIMs on a daily basis. The online survey was distributed to those who satisfy this premise. Since some of the civil servants do not directly interact with citizens and are in the role of managerial functions, we went to several local services centers in Nanjing city (it's the provincial capital of Jiangsu) and sent out questionaries to frontline workers over the counters in the service centers. We believe the overall data set received can represent public employees in different functions within street-level bureaus. The two data collection rounds were completed within three weeks. That is, we received the raw data by the middle of December 2021. All participants were informed about the process and objectives of our research, and the anonymity of all critical privacy were ensured.

Out of 310 surveys sent out, we gathered 173 and 89 raw data in the two rounds respectively, covering a response rate of 84.5%. For the high-quality data control, we deliberately inserted two trap questions at the designing stage. This method has been recognized as very effective when tackling self-reported data (Sullivan & Koh, 2019; Barger et al., 2011). Respondents that give wrong answer to the filtering questions were excluded. Besides, other strategies for data quality control were considered: 1) we omit those who had missing answers; 2) answers that largely deviated from standard response time, so those who answered very quickly (less than two minutes) were excluded. Under these criteria, 49 responses were dropped due to the lack of credibility out of 262 samples, yielding a total of 213 valid samples for the subsequent statistical analysis (Chen et al., 2006; Fang et al., 2021; Raziq & Maulabakhsh, 2015). The respondents' demographic profiles are presented in Table 1.

For a survey method, it's necessary to test whether the non-response bias exists. We followed the procedure advocated by Li (Li et al. 2018) and performed t-test to compare the responses for constructs between upper and lower quartiles of the sample. The results have shown no significant difference between early and late responses on any of the variables, suggests that non-response bias is not a concern in our sample.

Item	Property	Frequency	Percent
Gender	Male	87	40.85
	Female	126	59.15
Age	21-30	105	49.30
	31-40	96	45.07
	41-50	11	5.16
	>51	1	0.47
Education	Junior college or below	16	8
	Bachelor's degree	139	65
	Master's degree or above	58	27
Average monthly income (CNY)	<2999	1	0.47
	3000-4999	40	18.78
	5000-9999	137	64.32
	>10000	35	16.43
Job level	Front-line employees	172	80.75
	Office clerks/Junior-level staff	16	7.51
	Middle-level managers	23	10.80
	Senior Executives	2	0.94
Years served in public sector	$\leqslant$ 5 years	122	57.28
	>6 and $\leqslant$ 10 years	68	31.92
	> 10 years	23	10.80
Employment type	Life-long tenure	149	69.95
	Labor contract with fixed period	64	30.05
WOMIM use for work per day	< 1 hour	22	10.33
	$\geqslant$ 1 and $\leqslant$ 3 hours	65	30.52
	> 3 hours	126	59.15

Table 1. Respondents' demographic profiles (N=213)

Data analysis

Measurement model

Reliability and convergent validity

Our research model was verified using Structural Equation Modelling technique with partial least squares (PLS). In specific, we opt for SmartPLS 3.0 as the statistical analysis software. To test the reliability and validity of latent variables, we followed existing literature encompassing three common standards (Chin et al., 2003; Fornell & Larcker, 1981; Hair et al., 2012), namely composite reliability (CR), Cronbach's alpha, and average variance extracted (AVE). As shown in Table 2, the Cronbach's alpha score of each construct was above the recommended value of 0.7. Each construct's CR was greater than the threshold value of 0.7. The AVE values ranged from 0.650 to 0.777, which also fulfill the suggested values (above 0.5). The standardized path loadings of all item measurements on the corresponding constructs were no less than 0.725, indicating they are all significant and can be retained for further analysis. Our measurement model thus can be deemed as good reliability and convergent validity achieved

Constructs	Items	Outer loadings	Cronbach's alpha	Composite reliability	Average variance extracted (AVE)
Cognitive Fatigue (CF)	CF1	0.793	0.893	0.922	0.702
	CF2	0.773			
	CF3	0.88			
	CF4	0.885			
	CF5	0.852			
Compulsive Usage (CU)	CU1	0.831	0.777	0.870	0.690
	CU2	0.874			
	CU3	0.785			
Emotional Fatigue (EF)	EF1	0.789	0.895	0.923	0.705
	EF2	0.814			
	EF3	0.876			
	EF4	0.853			
	EF5	0.865			
Invasion of Life (IL)	IL1	0.817	0.904	0.933	0.777
	IL2	0.905			
	IL3	0.891			
	IL4	0.91			
Normative Response Pressure (NRP)	NRP1	0.826	0.822	0.881	0.650
	NRP2	0.749			
	NRP3	0.902			
	NRP4	0.736			
Perceived Information Overload (PIO)	PIO1	0.884	0.893	0.926	0.758
	PIO2	0.887			
	PIO3	0.898			
	PIO4	0.81			
	WPD1	0.87	0.919	0.939	0.756

Constructs	Items	Outer loadings	Cronbach's alpha	Composite reliability	Average variance extracted (AVE)
Work Performance Decrement (WPD)	WPD2	0.857			
	WPD3	0.902			
	WPD4	0.923			
	WPD5	0.789			

Table 2. Measurement quality

Notes: Threshold for each criterion: loadings>0.7; CR>0.7; Cronbach's alpha>0.7; AVE>0.5 (Hair et al., 2019)

Discriminant validity

We move on to the discriminant validity assessment with three indicators. In Table 3 , the square roots of the AVEs for each construct exceeded the correlation value on other constructs, indicating discriminant validity was established. Moreover, HTMT values of all constructs also satisfied the requirement that fell below the cut-off value of 0.9 (see Table 4). Although some authors suggested a conservative benchmark of 0.85, a more liberal value of 0.9 is also acceptable when the model included constructs that were conceptually similar (Henseler et al., 2015).

	CF	CU	EF	IL	NRP	PIO	WPD
CF	**0.838**						
CU	0.571	**0.831**					
EF	0.672	0.593	**0.84**				
IL	0.535	0.742	0.563	**0.882**			
NRP	0.319	0.453	0.339	0.57	**0.806**		
PIO	0.632	0.643	0.693	0.592	0.396	**0.87**	
WPD	0.699	0.542	0.606	0.583	0.436	0.57	**0.869**

Table 3. Fornell and Larcker's discriminant validity

Notes: The diagonal elements (bold figures) are the square root of the AVE, and the off-diagonal elements are the correlations among constructs.

	CF	CU	EF	IL	NRP	PIO	WPD
CF	-						
CU	0.674	-					
EF	0.746	0.704	-				
IL	0.595	0.872	0.625	-			
NRP	0.358	0.544	0.376	0.636	-		
PIO	0.705	0.765	0.77	0.659	0.445	-	
WPD	0.766	0.632	0.662	0.633	0.489	0.618	-

Table 4. HTMT ratio

Model fit and common method bias

To assess the model fit, we adopted a set of new quality indices suggested by Kock (Knock, 2015) (See Table 5). The results indicate that the actual values of all indices are acceptable, confirming a good model fit. Moreover, one single source of data may lead to common method bias (CMB), and this article checked the potential of CMB by calculating full collinearity variance inflation factor (VIFs) (Kock, 2015; Kock & Lynn, 2012). According to the calculating result, value of average full collinearity VIF is 2.358, satisfying the threshold of lower than 3.3. We thus supposed that common method bias was not a threat.

Notably, it has been argued that causality is an important aspect that must be examined prior to hypothesis testing (Guide & Ketokivi, 2015). We, therefore, examined the nonlinear bivariate causality direction ratio (NLBCDR) which explains the causality direction in the proposed model. By using WarpPLS 7.0, we observed that the value of NLBCDR is 1.000 which is greater than the acceptable value of 0.7. Hence, we state that endogeneity is not a major concern in our case.

	Criteria	Actual Value	Recommended Value
Classic Indices	APC	0.422 p<0.001	p<0.05
	ARS	0.487 p<0.001	p<0.05
	AVIF	1.835	Ideally <=3.3
	Tenenhaus GoF	0.612	Large if >=0.36
Additional Indices	SRMR	0.087	< 0.1
	SMAR	0.070	< 0.1
	SChS	9.434 p<0.001	p<0.05 (significant at the 0.05 level)
	STDCR	0.984	>= 0.7
	STDSR	0.949	>= 0.7

Table 5. Fit Indices

Notes: SRMR: Standardized root mean squared residual; SMAR: Standardized mean absolute residual; SChS: Standardized chi-squared; STDCR: Standardized threshold difference count ratio; STDSR: Standardized threshold difference sum ratio

Structural model

At this stage, the 5000 resampling bootstrapping procedures and the PLS algorithm were used to examine the structural model. The results of hypotheses testing were presented in Table 6. Findings revealed that all hypotheses were significantly supported at p<0.01 level except for the H4b. Perceived information overload had positive influence on cognitive fatigue (β=0.632, p<0.01) and emotional fatigue (β=0.532, p<0.001), thereby supporting H1a and H1b respectively. Compulsive usage had positive influence on emotional fatigue (β=0.231, p<0.001) and invasion of life (β=0.609, p<0.001), which supported H2a-H2b. Normative response pressure, as we found, significantly influenced invasion of life (β=0.294, p<0.001), in other words, H3 was accepted. With regard to work performance decrement, cognitive fatigue (β=0.461, p<0.001), emotional fatigue (β=0.156, p<0.05), and invasion of life (β=0.248, p<0.001) were found to have significant positive relationships with the target construct, thus H4a-H4c were confirmed.

	Path coeff.	f^2	t-statistic	p-value	Bias-corrected CI 97.5%	Result
H1a PIO -> CF	0.632***	0.665	14.207	0.000	0.71	Supported
H1b PIO -> EF	0.532***	0.344	8.109	0.000	0.651	Supported

	Path coeff.	f^2	t-statistic	p-value	Bias-corrected CI 97.5%	Result
H2a CU -> EF	0.231***	0.077	3.533	0.001	0.392	Supported
H2b CU -> IL	0.609***	0.775	13.862	0.000	0.691	Supported
H3 NRP -> IL	0.294***	0.180	5.609	0.000	0.39	Supported
H4a CF -> WPD	0.461***	0.248	6.504	0.000	0.593	Supported
H4b EF -> WPD	0.156*	0.027	2.051	0.049	0.326	Supported
H4c IL -> WPD	0.248***	0.090	4.042	0.000	0.369	Supported

Table 6. Hypotheses testing results

Notes: * p<0.05; *** p<0.001

Next, we examined coefficient of determination (R^2) to illustrate the explanatory power of our model, and Stone-Geisser's Q^2 to assess the prediction capability as well. Our model demonstrated considerable explanatory power on the target construct (work performance decrement), which is 0.562. The R^2 values of other constructs were substantial, implying that 40% of variance in cognitive fatigue, 52% of variance in emotional fatigue, and 62% of variance in invasion of life can be explained by our model. In addition, the Q^2 values were greater than zero, in which sufficient predictive relevancy had been proved. The overall PLS results are illustrated in Figure 2.

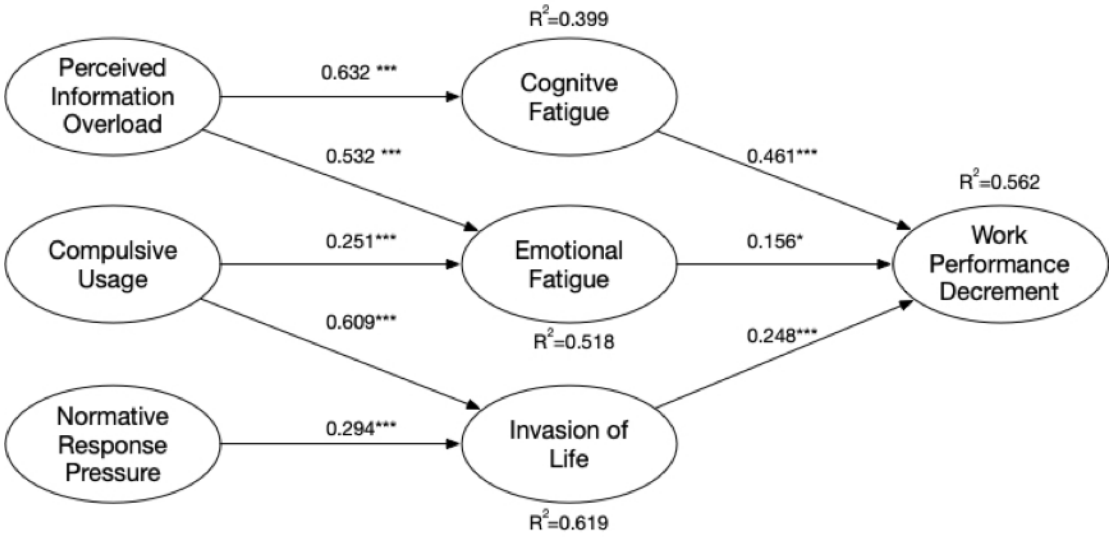

Figure 2. PLS results

Notes: * p<0.05; *** p<0.001

Discussion and conclusion

Summary of key results

Based on stressor-strain-outcome paradigm, the present study examined the adverse effects of intensive WOMIM engagement on psychological well-being and work performance. Briefly, the empirical results support that information overload, compulsive usage, and normative response pressure can generate psychological work strain that is positively related to decremental work performance among government employees. First, our findings proved that public employees with high information overload are likely to experience a high level of fatigue in both emotional and cognitive dimensions. This is in line with previous

literature which also established the significant link between information overload and social media fatigue (Pang, 2021). This result also verified that cognitive fatigue was a remarkable negative consequence derived from information overload in the situation of WOMIM. It empirically examined that persistently using WOMIM can considerably drain cognitive capabilities. Second, this study confirmed that normative response pressure has significant influence on invasion of life. When messages from WOMIM continuously pop up on the screen, pressure of swift replying makes annoying and intrusive feelings even more severe. That is, employees with high normative response pressure are easily subject to WOMIM life invasion. This finding is an important advancement of ICT-related stress literature because previous studies mainly explored the relationship between normative response pressure and strain in the email context (Brown et al., 2014), and ignored the recent development of response pressure within the social media context. Third, our findings substantiated that the two manifestations of fatigue are influential determinants of work performance decrement, which are consistent with previous literature on digital fatigue (Al-Ansari & Alshare, 2019; Lee et al., 2016; Tarafdar et al., 2010). Invasion of life has also been discovered to associate with work performance decrement. When the boundaries between work and private are vague, employees feel their lives were invaded by WOMIM, resulting in offline work performance decreased. This observation has also been supported by prior literature (Cao & Yu, 2019).

Theoretical contribution and practical implications

This study has examined information overload, compulsive usage, and normative response pressure as essential stressors that can raise strain represented by emotional fatigue, cognitive fatigue, and life invasion. Work performance decrement was employed as the negative behavioral outcome of strain. The current study enriches our knowledge of the adverse impacts of extended MIM use for work purposes. In particular, our theoretical contributions can be summarized as followings.

First, previous studies mainly analyzed that individuals' performance can be negatively influenced by social or hedonic use of social media applications. In other words, employees' work performance has been depleted due to other non-work activities engagement that drained their energy and attention. However, the impact of cognitive fatigue on work performance decrement, which has never been explored in the prior literature, was affirmed by our analysis. This investigation provides concrete evidence in illustrating the mental difficulties caused by extended WOMIM usages. Moreover, normative response pressure have been explored in email-stress context, yet it has not been considered under the social media background. We believe that replying to work messages from colleagues and supervisors is akin to the way of email-induced stress production process. This novel finding suggests that factors from organizational aspects need to be concerned and may play an important role in raising technology-induced stress. Moreover, this article is the first empirical attempt to understand how employees' well-being and subsequent work performance are influenced through WOMIM use. To that end, we expand the SSO framework application and contribute to the stress literature considerably.

In terms of practical suggestions, we expect that our findings can help policymakers realize that clearly defining the boundaries between work and personal life is valuable and helps maintain employees' mental well-being. Pursuing short-term efficiency cannot outweigh the negative outcomes accompanied with extensively WOMIM use. These social media tools provide possibilities of flexibility, availability, and autonomy, but they also impose burdens on employees. The continuous accessibility of instant messaging is a double-edged sword, and organizations should carefully consider both convenience and intrusiveness. It is imperative to establish management policies that strike a dynamic balance between optimizing organizational efficiency and promoting sustainable human resources development. Recommended measures include scheduling work hours in a reasonable way, encouraging employees to adhere to regular working hours, and constraining the use of instant messaging during non-working hours. If an individual's work performance consistently be affected by fatigue and other negative reactions over time, the overall satisfaction and commitment will also be compromised ultimately, which is the last thing the public institutions desire. Besides, technical interventions like filtering mechanism on WOMIM in order to separate the social function and work function have also been suggested by several studies (Chaouali, 2016), we then propose that appropriate solutions for relieving stress and negative behavioral outcomes are supposed to be holistic that covers both technical intervention and policy guidance.

Limitations and future research

The present work has some limitations. We acknowledge that the instruments and samples are limited. All of our respondents are constrained to one certain country, which means the generalizability of our findings. It is notable that scholars may extend our observations by investigating a similar model with a broad diversity of samples. Second, we use self-reported survey data to test our model which would have been subject to some biases (for example, social desirability bias). Other approaches such as experiments are recommended for this research topic. Furthermore, the sampling method we adopted is for convenience purposes. The results may be less effective in reflecting all public employees' attitudes since differences in geographical, gender and specific positions have not been taken into account. Finally, since we have not adopted either experimental method or longitudinal data, we recognize that the findings are correlational. Further scholars may incorporate mixed methods and provide more conclusive evidence for causality.

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