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Does Techno-invasion Trigger Job Anxiety? Moderating Effects of Computer Self-efficacy and Perceived Organizational Support

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Abstract: Although information and communication technologies is beneficial for improving employee performance, frequently learning new technologies or extensively using technologies to work in non-working hours may lead to an increase of employee's techno-invasion. However, little is known whether techno-invasion, a technostressor, causes employee job anxiety. Also, it remains unclear "when" techno-invasion is particularly or less correlated to employee negative emotion (job anxiety in this study). Based on the stress, appraisal and coping theory and the theory of conservation of resources, we examined whether techno-invasion increases employee job anxiety, and whether computer self-efficacy and perceived organizational support can buffer this effect of techno-invasion. After testing our hypotheses using 374 samples from China's manufacturing and IT industries, the results show that employee techno-invasion positively predicts job anxiety, while both employee computer self-efficacy and perceived organizational support can significantly weaken this association. More importantly, we find a larger moderating effect of computer self-efficacy when employee perceived a low level of perceived organizational support, indicating a jointly moderating effect of computer self-efficacy and perceived organizational support.

Keywords: technostress, techno-invasion, job anxiety, computer self-efficacy, perceived organizational support, Stress, Appraisal and Coping theory, conservation of resources

1. INTRODUCTION

Information technology (IT) provide strong support for organizations to optimize business processes, improve financial performance, and enhance competitiveness. Therefore, more organizations are using various types of information technologies to help employees perform works. This is because IT breaks the limits of time and space, makes employees keep in touch with tasks at any time, and solves problems arising from works, thus making them continuously work in non-working place after working hours. IT use has been found to significantly improve individual and organizational performance ^[1]. However, along with generating obvious business benefits, IT can also cause negative reactions in individuals. For example, the use of IT creates stress in users ^[2]. Employees are often forced to apply IT to keep in touch with tasks in non-working hours. Moreover, employees with low computer skills have to learn new technologies or information systems after work, which makes their lives be constantly invaded. The mental stress that employees experience is harmful to employees. Specially, an increasing number of employees are facing higher intensity of work stresses and life invasion due to the use of IT, which is named as Techno-invasion (one of the five techno-stressors) ^[3]. Research has showed that technostress manifests its effects in the form of increased role overload, role conflict, exhaustion and burnout and decreased job satisfaction and technology-enabled innovation and performance ^[2, 4-6]. A meta-analysis showed that employee negative emotion significantly predicts lower level of task performance and higher level of counterproductive behaviors ^[7]. Jones et al. ^[8] found that job anxiety can increase employees' mental illness, which in turn leads to employee turnover and low labor productivity.

While techno-invasion was found to be harmful to employee organizational commitment and continuous commitment as a result of decreasing job satisfaction ^[3], and was confirmed to decrease individual productivity

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by increasing role conflict and overload^[2,9], we have limited knowledge of whether techno-invasion influences employee negative emotions such as job anxiety. According to the theory of conservation of resources^[10], people are always trying to get and maintain their existing resources. When employees perceived threat or loss of their resources, they would feel anxious, restless and pressured^[11]. In the context of IT use at work, employees' techno-invasion means that they would spend much of their personal time and effort in learning and using IT after work. This not only consumes their existing conditions and energies resources, also hinders them to gain new individual resources such as object resources, conditions and energies^[10], thus making them feel job anxiety. Therefore, one purpose of this study is to enhance our understanding of whether and how techno-invasion may influence employees' IT-enabled job anxiety.

Employee negative emotion is an essentially unavoidable part of their daily work. It also may decrease employee intention to extend the use of IT through decreasing satisfaction with the use of IT^[12]. This suggests that additional research is needed to understand "when" employee negative emotion is particularly or less harmful with respect to mental health^[13]. Clarifying these issues can better guide organizational practice and managerial decision regarding "how" to mitigate such detrimental effects^[13]. As an exception, Chen et al.^[14] found that individuals technostress is related to can anxiety, depression, and other negative emotions when they feel stress. However, it remains unclear "when" techno-invasion is particularly or less harmful with respect to employee job anxiety. Therefore, the other purpose of this study is to identify boundary conditions under which the detrimental effects of techno-invasion on job anxiety can be weakened.

According to the stress, appraisal and coping theory^[15], employees will evaluate the nature, extent and potential hazards of techno-invasion (techno-stressor), and their existing resources that can be used to cope with techno-invasion. Then, the evaluation results determine their reaction (such as anger, anxiety, sadness, scare and fear and other negative emotions) to such stressor. In other words, enough individual personal characteristics, conditions and energies resources can be used to cope with techno-invasion. Computer self-efficacy and perceived organizational support are two important resources for employees. Computer self-efficacy is individuals' beliefs about their abilities to competently use computers^[16]. Computer self-efficacy was found to exert a significant influence on individuals' emotional reactions to computers (affect and anxiety)^[16]. Perceived organizational support is the individual's psychological perception of concerning the degree to which the organization values their contributions and cares about their welfare^[17]. We argue that the stress, appraisal and coping theory provides a useful framework to clarify whether computer self-efficacy and perceived organizational support can buffer the detrimental effects of techno-invasion on job anxiety. In order to advance our understanding of techno-invasion at work, the present study was designed to investigate whether computer self-efficacy and perceived organizational support moderate the relationship between techno-invasion and job anxiety, and further whether there is interaction between two moderators.

2. THEORY AND HYPOTHESE

2.1 Theoretical framework

In this study, we use the transactional model of stress and coping (TMSC)^[18] as the theoretical framework for explaining why employee techno-invasion can predict job anxiety, and for revealing the mechanism through which individual's resources moderate the influence of techno-invasion on job anxiety. According to the TMSC, stress is construed as person–environment transactions^[18]. These transactions depend on the impact of external stressors, which are demands made by the internal or external environment that upset balance and thereby influence individual physical and psychological well-being^[15, 18]. Employee's stress is a result of imbalance between demands and resources. They may experience stress when demands exceed their resources or their ability to cope the stress. Stressors are the conditions or factors that create stress, which, in the case of IT usage

in this study, is termed ‘techno-invasion’^[19]. The introduction and use of a new and complex IT in an organization is a disruptive event that generates several expected and unexpected consequences in the user’s environment^[20]. When faced with stressors, individuals cope with the disruptions using two key processes (primary and second appraisal) that continuously influence each other^[15, 18]. The primary appraisal is a person’s judgement about the significance of the event as stressful, positive, controllable, challenging or irrelevant. The second appraisal is an assessment of their coping resources. Individuals perform different actions to deal with the situation at hand, which are their coping efforts^[18]. Thus, coping is the act of adaptation that individuals perform in response to disruptive events that occur in their environment. Thus, employees with different level of resources will evaluate and appraise techno-invasion differently^[18].

In addition to the TMSC, we apply the conservation of resources (COR)^[10] theory to identify resources perceived by individuals to cope techno-invasion stressor. The COR theory suggests that individuals are motivated to protect their current resources (conservation) and acquire new resources (acquisition)^[10]. According to the COR theory, four kinds of resources whose loss and gain result in stress or eustress (i.e., well-being) are identified, respectively^[10]. *Object resources* are valued because of some aspect of their physical nature or because of their acquiring secondary status value. *Conditions* are resources to the extent that they are valued and sought after. Marriage, tenure, and seniority are examples of these. *Personal characteristics* are resources to the extent that they generally aid stress resistance. *Energies* are the last resource category and include such resources as time, money, and knowledge^[10]. In the context of techno-invasion, there are two kinds of individual resources which are important for them to take actions to cope techno-invasion stressor. Individual’s computer self-efficacy is an important personal characteristics. On the other hand, employee’s perception of organizational support includes more than one type of resources, such as object resources, conditions, and energies. In this study, we seek to explore the moderating effects of both resources on the relation between techno-invasion and job anxiety.

2.2 The influence of techno-invasion on job anxiety

Organization is increasingly dependent on information technology. Employees need adapt to new systems and technologies constantly^[3]. Information technology used by organizations becomes more complex and diverse, organizational requirements for employee computer skills are getting higher and higher. When employees cannot adapt to these requirements, it will form technostress. Tarafdar et al.^[2] argued that technostress is a higher-order structure, including techno-overload, techno-invasion, techno-insecurity, techno-uncertainty, and techno-complexity. This research particularly focuses on the techno-invasion stressor, which is caused by the blurred boundary between work and non-work, and employees’ responses to this stressor.

Techno-invasion, as a result of the use of new technologies, will make many employees’ personal lives be invaded by their work, and force them to be continually connected with work anytime and anywhere^[21]. The convenience provided by technologies often compelled employees to carry out work in non-working hours (such as quitting time, weekends, holidays, etc.), the boundary between work and family became blurred, employees were therefore not well borne by the family, which caused work-family conflict, will make them anxious. At the same time, individuals had feelings of being tied by technologies; employees’ time and space were invaded by technologies making them feel job anxiety. When employees perceived threats or losses of resources, they would feel anxious, restless and pressured^[11]. Usually, the total amount of resources owned by an individual are certain, the allocation of resources among individuals at work and family is generally followed by a ratio of relative stability in order to maintain balance. Once such a relatively stable proportion is destroyed, the balance will be broken. For example, learning new technologies or overtime on weekends will lead to employees’ shortage of investment in the family time and energy, which triggers work-family conflict and results in higher levels of job anxiety. Based on the above analysis, this study put forward the following assumption:

H1: Techno-invasion significantly positively affects job anxiety.

2.3 The moderating effect of computer self-efficacy

Computer self-efficacy is the self-judgment of individuals' abilities to use the computer to complete tasks^[16], and reflects individuals' confidence in their abilities of using computers. Prior study pointed that stresses were generated when people evaluated and thought that their resources couldn't cope with current threats^[15]. That is, individual evaluation is an important factor to produce anxiety. Facing the same stressor, individuals will generate different responses due to different cognitive assessments. Computer self-efficacy is an important cognitive evaluation variable to measure individuals' computer skills. For employees with a high level of computer self-efficacy, they are increasingly confident that they have skills and psychological resources to cope with the techno-invasion. Therefore, the response to this technostress was less stressful. Furthermore, empirical studies of computer self-efficacy have been found in the early stage, computer self-efficacy is helpful to reduce employee computer anxiety^[16, 22].

H2: Computer self-efficacy negatively moderates relationship between techno-invasion and job anxiety.

2.4 The moderating effect of perceived organizational support

Perceived organizational support is the individual's psychological perception of concerning the degree to which the organization values their contributions and cares about their welfare^[17]. When employees perceived higher organizational support, it could reduce negative impacts of pressures. Perceived organizational support was found to play a significant role in moderating the relationship between role pressure (such as role conflict) and pressure results (performance, satisfaction and retention)^[23]. When an organization is a supportive organization, it can create a mutual relationship among colleagues, and help employees solve difficulties from work and lives, thus reduce job stress. According to psychological stress theory^[15], when employees face techno-invasion stressors, employees tend to think that they have more resources to cope with stressors if organizations can provide resources for employees, and thus relieve the anxiety caused by the techno-invasion.

H3: Perceived organizational support negatively moderates relationship between techno-invasion and job anxiety.

2.5 Interaction between computer self-efficacy and perceived organizational support

This study not only analyzes the independent moderating effects of computer self-efficacy and perceived organizational support, but also will further explore the following issues: when two resources are available at the same time, employees are more dependent on or give priority to the use of which resources to cope with techno-invasion stressors? Resource conservation theory holds that the individual resources (such as time, physical condition, emotional state, attention, etc.) are limited, individuals will do their utmost to acquire, preserve and maintain their limited resources^[10]. When employees feel techno-invasion stressors, they need call and consume resources to deal with stressors. If employees are at lower levels of perceived organizational support, they can only rely on their own resources--computer self-efficacy replies to the possible stresses of the techno-invasion, thus the moderating effect of computer self-efficacy on the relationship between techno-invasion and job anxiety is greater. On the contrary, if organizations could provide adequate resources, relationships or psychological support for employees to cope with pressures, employees will give priority to the use of organizational resources to cope with stressors in order to set aside and maintain their own resources. At this time, the moderating effect of computer self-efficacy on the relationship between techno-intrusion and job anxiety is weak, even does not exist.

H4: Perceived organizational support moderates the moderating effect of computer self-efficacy on the relationship between techno-invasion and job anxiety: This moderating effect is attenuated for employees with high perceived organizational support, but strengthened for ones with low perceived organizational support.

3. METHODOLOGY

3.1 Measurements

To improve the reliability and validity of measurements and results, this study used existing scales to measure variables in this study. This study used the techno-invasion (TI) scale developed by Tarafdar et al. [2], including 4 measurement items: "I feel that computer technology has invaded my private life, I have to keep in touch with work by the computer technology during the holidays," "I have to sacrifice holiday and weekend time to learn new computer technology", " I feel that computer technology does occupy the time getting along with my family. " We used job anxiety (JA) scale^[24] to measure job anxiety. It includes 4 items: "I feel anxious at work", "I feel nervous at work", "I feel tense at work", and "I feel restless at work". The computer self-efficacy (CSE) scale by Compeau and Higgins^[16] was used in this study to measure computer self-efficacy. These 4 items are: "If someone else had helped me get started, I can use this technique to finish the work", "If I had a lot of time to complete the job for which the software was provided, I can use the new technique to finish the work", "If someone showed me how to do it first, I can use the new technique to finish the work ", and "If I had used similar packages before this one to do the same job, I can use the new technique to finish the work". Finally, we selected 4 items from organization support scale^[25] to measure perceived organizational support (POS). They are "my organization would forgive an honest mistake on my part", "my organization cares about my opinions", "help is available from my organization when I have a problem", and "my organization is willing to help me when I need a special favor". Also, the measurements of control variables are shown in Table 1.

3.2 Data collection

The data was collected with questionnaires. Our target participants were managers and general staffs working in Chinese manufacturing industry and IT industry. Survey time is from July to September in 2014. Survey sample covered Beijing, Shanghai, Guangdong, Jiangsu, Zhejiang, and other 26 provinces. A total of 402 questionnaires were collected, with a total of 374 valid questionnaires (93.03 percent). Among them, about 70.07 percent of the samples were from Guangdong, Beijing, Shanghai, Shandong, Jiangsu, Zhejiang and other provinces. Table 1 shows the demographic information of 374 respondents.

Table 1. Descriptive statistics of sample distribution

Variables	Measurements	Frequency (%)	Variables	Measurements	Frequency (%)
Gender	Male	156 (41.7)	Education	High school or below	4 (1.1)
	Female	218 (58.3)		Two-year College	28 (7.5)
Age	<26	9 (2.4)		Four-year College	323 (86.4)
	26-35	281 (75.1)		Graduate or above	19 (5)
	36-45	65 (17.4)	Monthly Income (RMB)	≤3000	13 (3.5)
	46-55	18 (4.8)		>3000 and ≤5000	83 (22.2)
	>55	1 (0.3)		>5000 and ≤10000	214 (57.2)
work experience (year)	<1	3 (0.8)	>10000	64 (17.1)	
	1-2	6 (1.6)	Position	General staff	66 (17.7)
	2-5	31 (8.3)		Front-line manager	70 (18.7)
	5-10	260 (69.5)		Middle manager	184 (49.2)
	>10	74 (19.8)		Senior manager	54 (14.4)

4. RESULTS

4.1 Reliability and validity

To test measurements reliability, we used the SPSS17.0 software to conduct an exploratory factor analysis. Finally we extracted four factors corresponding to the latent variables in this study. The results are shown in Table 2. Among them, the cumulative variance was 69.77 percent, and the KMO value was 0.864 ($p < 0.001$). Moreover, the factor loadings (0.896~0.686) of all the items are higher than 0.50. Further, reliability analysis

showed that the Cronbach's alpha coefficients of techno-invasion, job anxiety, computer self-efficacy, and perceived organizational support were 0.890, 0.933, 0.776 and 0.763, larger than 0.70. Therefore, there was a high internal consistency of the measurements, which showed that the reliability was good.

Table 2. Exploratory factor analysis and reliability test results

Variables	Factor1	Factor2	Factor3	Factor4	Cronbach's α
Job anxiety(JA)	0.860~0.896				0.933
Techno-invasion(TI)	0.823~0.872				0.890
Computer self-efficacy(CSE)	0.690~0.786				0.776
Perceived organizational support(POS)	0.686~0.773				0.763
Eigenvalue	5.130	3.036	1.915	1.082	
Variance explained (%)	32.061	18.977	11.967	6.763	

The scale of this study is adapted from the existing mature scales, thus it has a good content validity. In order to test construct validity, we used AMOS17.0 to conduct a confirmed factor analysis. Confirmatory factor analysis of all the measurement models showed that the standardized loadings of all measurement items, except POS 1 (0.48), are 0.605~0.899, greater than 0.50. The composite reliability (CR) is 0.771~0.932, more than 0.7. These three index values indicate that the scale of this research has a high convergent validity. To evaluate the discriminant validity, we set up five factor models to compare the fitting indices, these models fitting indices are shown in Table 3. From the data and the fitting results of the models, single factor model, two-factor model and three-factor model 1 were significantly worse than the proposed values. While the fitting indices of the three-factor 2 model are near to the proposed value, the four-factor model shows the best fitting indices. Therefore, multiple factor model comparison results show that the four-factor model is the best ($\chi^2/df=1.376$, RMR=0.056, IFI=0.990, GFI=0.957, CFI=0.988, RMSEA=0.032), indicating a good discriminant validity of four scales used in this study.

Table 3. Fit indices of each factor model

Model	χ^2/df	RMR	CFI	IFI	GFI	RMSEA
Single-factor	22.5	0.36	0.68	0.68	0.56	0.24
Two-factor	18.57	0.32	0.73	0.73	0.61	0.21
Three-factor 1	7.62	0.13	0.90	0.90	0.79	0.13
Three-factor 2	2.77	0.07	0.96	0.96	0.90	0.07
Four-factor	1.38	0.06	0.99	0.99	0.96	0.03

Notes: Single-factor: TI+JA+POS+CSE; Two-factor: TI+JA, POS+CSE; Three-factor 1: TI, JA+CSE, POS; Three-factor 2: TI, JA, POS+CSE; Four-factor: TI, JA, POS, CSE

4.2 Hypothesis testing

To test the moderating effect of computer self-efficacy on the relationship between techno-invasion and job-anxiety, we made a hierarchical regression analysis. Four regression models (model 1 to model 4) were established, and the stepwise regression analysis was carried out. Then, the same procedure was performed to examine the moderating effect of perceived organizational support. Final results are presented in Table 4.

According to the results of model 4 and model 8, the techno-invasion has a significant positive relationship to the job anxiety, no matter what kind of situation ($\beta_1=0.675$, $\beta_1=0.604$, $p<0.001$), it shows that the higher level of employees' perception of techno-invasion, the higher level of job anxiety, thus, H1 was supported. In model 4, the interaction of computer self-efficacy and techno-invasion is significant ($\beta=-0.193$, $p<0.01$), explained that computer self-efficacy negatively moderated the relationship between techno-invasion and job anxiety, H2 was supported. Moreover, total variance explained of job anxiety in model 4 was 38 percent. In model 8, the interaction between perceived organizational support and techno-invasion is significant ($\beta=-0.146$, $p<0.001$),

suggesting that perceived organizational support negatively moderate relationship between techno-invasion and job anxiety. Thus, H3 was supported.

Table 4. Moderating effect of computer self-efficacy and perceived organizational support

Variables	Computer self -efficacy				Perceived organizational support			
	Model1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Gender	-0.306*	-0.264*	-0.197	-0.204	-0.306*	-0.264*	-0.247	-0.234
Age	0.136	0.135	-0.027	-0.037	0.136	0.135	0.073	0.035
Education	-0.401*	-0.372*	-0.17	-0.181	-0.401*	-0.372*	-0.23	-0.248
Experience	-0.657***	-0.647***	-0.425***	-0.401***	-0.657***	-0.647***	-0.581***	-0.513***
Position	0.115	0.105	0.13	0.125	0.115	0.105	0.117	0.088
Income	-0.137	-0.036	-0.016	-0.064	-0.137	-0.036	0.015	-0.004
TI		0.270***	0.239***	0.675***				
CSE			-0.813***	-0.012				
TI*CSE				-0.193**				
TI						0.270***	0.268***	0.604***
POS							-0.408***	0.071
TI*POS								-0.146***
R2	0.112	0.187	0.363	0.380	0.112	0.187	0.235	0.273
ΔR^2	0.112	0.075	0.176	0.017	0.112	0.075	0.048	0.038

Notes: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

To examine whether the moderating effect of computer self-efficacy is moderated by perceived organizational support, the highest 27 percent and lowest 27 percent of perceived organizational support were selected as high and low groups respectively. Then, the same regression procedures were conducted to compare the moderating effects of computer self-efficacy with two groups respectively. As shown in Table 5, at low level of perceived organizational support, the interaction between computer self-efficacy and techno-invasion was significant ($\beta = -0.404$, $p < 0.05$). However, at high level of perceived organizational support, the moderating effect of computer self-efficacy was not significant ($\beta = -0.218$, $p > 0.1$). That is, there is a significant difference in the moderating effect of computer self-efficacy on the relationship between techno-invasion and job anxiety in different levels of perceived organizational support, indicating that H4 was supported.

Table 5. Interaction effect between perceived organizational support and computer self- efficacy

Variables	Low levels of perceived organizational support				High levels of perceived organizational support			
	Model 9	Model 10	Model 11	Model 12	Model 13	Model 14	Model 15	Model 16
Gender	-0.466	-0.275	-0.263	-0.333	-0.780**	-0.765**	-0.615*	-0.617*
Age	0.124	0.014	-0.142	-0.183	-0.156	-0.111	-0.095	-0.06
Education	-0.085	-0.03	0.101	0.165	-0.567	-0.505	-0.572	-0.643
Experience	-0.31	-0.196	-0.091	-0.016	-0.581*	-0.634*	-0.591*	-0.631*
Position	-0.024	-0.057	-0.009	0.007	0.371*	0.331*	0.356*	0.370*
Income	-0.211	-0.246	-0.295	-0.380*	-0.055	0.121	0.105	0.077
TI		0.440**	0.440**	1.118**		0.207**	0.199**	0.769*
CSE			-0.609**	1.089			-0.556*	0.335
TI*CSE				-0.404*				-0.218
R2	0.104	0.203	0.285	0.316	0.17	0.233	0.273	0.293

ΔR^2	0.104	0.099	0.082	0.031	0.17	0.062	0.04	0.019
ΔF	1.819	11.545	10.596	4.154	3.219	7.576	5.091	2.496

Notes: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

5. DISCUSSION AND CONCLUSION

5.1 Findings and theoretical implications

Based on the stress, appraisal and coping theory and the theory of conservation of resources, we examined whether techno-invasion increases employee job anxiety, and whether computer self-efficacy and perceived organizational support can buffer this effect of techno-invasion. The results support our hypotheses, yielding interesting findings. First, techno-invasion is positively related to job anxiety, indicating that employees' techno-invasion can significantly predict their job anxiety. This is not consistent with prior results^[4]. Second, computer self-efficacy and perceived organizational support moderate the relationship between techno-invasion and job anxiety, meaning that both computer self-efficacy and perceived organizational support can weaken the impact techno-invasion on job anxiety. Third, the moderating effect of computer self-efficacy is moderated by perceived organizational support. This moderating effect is not significant for employees with high perceived organizational support, but significant and strengthened for ones with low perceived organizational support.

This study enriches the research of the computer-related technostress. First, this study improves our understanding of the harmful effects of techno-invasion on employee mental health through investigating the impact of techno-invasion on job anxiety. Second, the stress, appraisal and coping theory is extended to understand the dark side of IT, namely technostress in this study, which provides a new perspective for technostress research. Third, unlike Chen et al. ^[14], we examine "when" the impact of techno-invasion on job anxiety can be weakened. This is more important for managers to design proper intervention strategies.

5.2 Practical implications

This study has important practical complications. First, techno-invasion is a new stressor that causes job anxiety due to the extensive use of computer technologies. Enterprises had better pay attention to losses of staffs' non-working time due to the information technology. They need take certain measures to prevent technologies invading employees' normal life, such as implementing flexible working system, or providing family friendly policies just like day care center service. Second, the moderating effect of computer self-efficacy and perceived organizational support showed that enterprises not only reduce stressor of techno-invasion, but also reduce job anxiety triggered by techno-invasion through improving employees' computer self-efficacy and perceived organizational support. For example, enterprises can recruit employees with high computer self-efficacy or enhance employees' computer self-efficacy by computer training program, improve employees' abilities and confidence about completing tasks by using computers or information technology. Besides, provide supports about learning and applications of new technologies from organizations', supervisors' and colleagues' resources, emotions and information in order to improve perceived organizational support, and effectively reduce damages to the employees' job anxiety and physical and mental health concerned with techno-invasion.

5.3 Limitations and future research

Some limitations should be noted regarding to the current findings. First, this study is subject to restrictions of time, cost and other aspects, this study used a cross-sectional survey design; it is difficult to reflect the dynamic effects of techno-invasion, computer self-efficacy and perceived organizational support on job anxiety comprehensively and accurately. Employees in organizations may have been used to the techno-invasion as work experience increases, produced "antibodies", all of these changes will affect the relationship between techno-invasion and job anxiety. In the future research, longitudinal study of tracking data can be taken to analyze the impact of techno-invasion on job anxiety, increase the reliability of conclusions of the study. Secondly, this study explored the influence of computer self-efficacy and perceived organizational support on

the relationship between techno-invasion and job anxiety. Future researchers can identify other moderating or mediating variables that may exist through a more comprehensive theoretical analysis and exploratory case analysis, include it in this research model, establish a more perfect theoretical model.

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REFERENCES

- [1] Dewett T. (2003). Understanding the Relationship Between Information Technology and Creativity in Organizations. *Creativity Research Journal*, 15(2): 167-182.
- [2] Tarafdar M, Tu Q, Ragu-Nathan B, S., et al. (2007). The Impact of Technostress on Role Stress and Productivity. *Journal of Management Information Systems*, 24(1): 301-328.
- [3] Ragu-Nathan T S, Tu Q. (2008). The Consequences of Technostress for End Users in Organizations: Conceptual Development and Empirical Validation. *Information Systems Research*, 19(4): 417-433.
- [4] Ayyagari R, Grover V, Purvis R. (2011). Technostress: technological antecedents and implications. *MIS Quarterly*, 35(4): 831-858.
- [5] Ragu-Nathan T S, Tarafdar M, Ragu-Nathan B S, et al. (2008). The Consequences of Technostress for End Users in Organizations: Conceptual Development and Empirical Validation. *Information Systems Research*, 19(4): 417-433.
- [6] Tarafdar M, Pullins E B, Ragu-Nathan T S. (2015). Technostress: negative effect on performance and possible mitigations. *Information Systems Journal*, 25(2): 103–132.
- [7] Rossi M E. (2012). A Meta-Analytic Investigation of the Relationship Between State Affect, Discrete Emotions, and Job Performance. *Human Performance*, 25(5): 377-411.
- [8] Jones M K, Latreille P L, Sloane P J. (2016). Job Anxiety, Work-Related Psychological Illness and Workplace Performance. *British Journal of Industrial Relations*, 54(4): 742-767.
- [9] Alam M A. (2016). Techno-stress and productivity: Survey evidence from the aviation industry. *Journal of Air Transport Management*, 50: 62-70.
- [10] Hobfoll S E. (1989). Conservation of resources. A new attempt at conceptualizing stress. *American Psychologist*, 44(3): 513-24.
- [11] Hobfoll S E. (2001). The Influence of Culture, Community, and the Nested-Self in the Stress Process: Advancing Conservation of Resources Theory. *Applied Psychology*, 50(3): 337–421.
- [12] Fuglseth A M, Sørensen Ø. (2014). The effects of technostress within the context of employee use of ICT. *Computers in Human Behavior*, 40: 161-170.
- [13] Chi N W, Chang H T, Huang H L. (2015). Can personality traits and daily positive mood buffer the harmful effects of daily negative mood on task performance and service sabotage? A self-control perspective. *Organizational Behavior & Human Decision Processes*, 131: 1-15.
- [14] Chen J, Wei J, Zhang J. (2014). Moderating Role of Self-focused Attention on the Relationship between Stress and Negative Affect. *Chinese Journal of Clinical Psychology*, 22(6): 1087-1090 (in Chinese).
- [15] Folkman S. (2013). Stress: Appraisal and Coping, in *Encyclopedia of Behavioral Medicine*, M.D. Gellman and J.R. Turner, Editors. Springer New York: New York, NY.

- [16] Compeau D R, Higgins C A. (1995). Computer self-efficacy: development of a measure and initial test. *MIS Quarterly*, 19(2): 189-211.
- [17] Eisenberger R, Cummings J, Armeli S, et al. (1997). Perceived organizational support, discretionary treatment, and job satisfaction. *Journal of Applied Psychology*, 82(5): 812-20.
- [18] Lazarus R S, Folkman S. (1984) *Stress, appraisal, and coping*. Springer Pub. Co.
- [19] Tarafdar M, Tu Q, Ragu-Nathan T. (2010). Impact of Technostress on End-User Satisfaction and Performance. *Journal of Management Information Systems*, 27(3): 303-334.
- [20] Srivastava S C, Chandra S, Shirish A. (2015). Technostress creators and job outcomes: theorising the moderating influence of personality traits: Technostress creators and job outcomes. *Information Systems Journal*.
- [21] Tarafdar M, Tu Q, Ragu-Nathan T S, et al. (2011). Crossing to the dark side: examining creators, outcomes, and inhibitors of technostress. *Communications of the ACM*, 54(9): 113-120.
- [22] Marakas G M, Yi M Y, Johnson R D. (1998). The Multilevel and Multifaceted Character of Computer Self-Efficacy: Toward Clarification of the Construct and an Integrative Framework for Research. *Information Systems Research*, 9(2): 126-163.
- [23] Stamper C L, Johlke M C. (2003). The Impact of Perceived Organizational Support on the Relationship Between Boundary Spanner Role Stress and Work Outcomes *Journal of Management*, 29(4): 569-588.
- [24] Jonge J D, Schaufeli W B. (1998). Job characteristics and employee well - being: a test of Warr's Vitamin Model in health care workers using structural equation modelling. *Journal of Organizational Behavior*, 19(4): 387 - 407.
- [25] Eisenberger R, Stinglhamber F. (1986). Perceived organizational support. *Journal of Applied Psychology*, 71(3): 500-507.