The Interaction Effect of Technostress and Non-Technological Stress on Employees' Performance

Emergent Research Forum Paper

Weian Wang
The University of North Carolina at Greensboro
w_wang5@uncg.edu

Mohammad Daneshvar Kakhki
The University of North Carolina at Greensboro
m_danesh@uncg.edu

Vishal Uppala
The University of North Carolina at Greensboro
v_uppala@uncg.edu

Abstract

At a fast pace, firms are introducing new technologies in accordance with employees suffering. Employees continuously adapt to new information technologies, functionalities, and work flows, as well as spend more time and effort to renew their technological skills. Here, suffering refers to technostress, and this has been studied extensively in IS research. Employees struggle with work stress, and it does not just stem from the use of IT. Work stress also comes from other non-technological demands such as time pressure and management expectations for productivity. In line with Job Demand-Resources (JD-R) theory, this study explores the interaction effect of technostress and non-technological stress on employee performance.

Keywords

Technostress, work stress, job demand-resources theory.

Introduction

Given the pervasiveness of information technology (IT) in all aspects of the organization, firms invest significantly in the areas of IT and human resources to optimize their business processes and to find positions for competitive advantage in markets. With the development of information and communication technologies (ICT), individuals and businesses are demanding access to applications from anywhere at any time (Wang et al. 2008). Due to the ubiquity of digitally-enabled technologies, firms are realizing great benefits in productivity effectiveness and efficiencies in their business processes and employees. However, the use of IT also results in negative consequences that harm individuals, organizations, and entire societies. In many firms, these consequences lead to stress associated with ICT usage experienced by employees. Employees continue to struggle following the fast pace of new ICTs introduction by firms, and employees have to spend more time and effort renewing their technological skills (D'Arcy et al. 2014; Tarafdar et al. 2015). And, they continue to adapt new information technologies, functionalities, and work flows, as well as consistently connect with such digital technologies (Ragu-Nathan et al. 2008; Tarafdar et al. 2011). In this regard, the concept of technostress has been drawing considerable attention from the Information System (IS) scholars and industry practitioners.

The term of technostress was developed by Craig Brod (1984) to describe "the stress caused by an inability to cope with the demands of organizational computer usage" (Tarafdar et al. 2011, p. 304). IS scholars have extensively studied technostress within four streams: antecedents, creators, consequences, and mitigations (Tarafdar et al. 2007; Ragu-Nathan Et al. 2008; Ayyagari et al. 2011; Tarafdar et al. 2015). However, these studies only focused on exploring employee technostress itself in work environments, and they do not consider the combined effects of technostress and non-technological stress on employees' job performance. The stress sources are more grounded through complex interactions between employees

and work environments (Beehr and Newman 1978). So it is critical to study the work stress with considering both technological and non-technological demands such as time pressure, self-emotion, and management expectations for productivity (Kinicki and Vecchio 1994; Zapf et al. 2001; Ganster and Schaubroeck 2013). These non-technological factors affect employees' satisfaction and commitment to the organization, thereby causing job burnout (Moore 2000). This study is going to contribute to our understanding about the interrelation between technostress and non-technological stress that cause employees' physical and psychological responses with regard to their jobs. Specifically, this study attempts to address the following research question: *How does the interaction between technostress and non-technological stress impact employees' job performance?*

This research draws from the Job Demand-Resources (JD-R) model. It considers employees work stress in socio-technological environments. The JD-R model aims to explain the imbalance of the job demands on the individual and the job resources employees given to cope with such demands (Demerouti et al. 2001a; Bakker and Demerouti 2007). This model depicts the interactions between job characteristics and employee's responses in the work environment. Now, employees face both work stress associated with the usage of IT as well as non-technological stress from their daily work. JD-R model will help us with better understanding the interrelation of technostress and non-technological stress of employees on their job performance.

Job Demand-Resources Model

The fundamental assumption of JD-R Model asserts every work environment has its own specific characteristics that can be divided into two general categories – job demand and job resource (Demerouti et al. 2001a). The interactions between job demand and resources may explain the impact of job demands on job performance in phenomenon such as burnout (Bakker et al. 2003c). The job demand is defined as "those physical, psychological, social, or organizational aspects of the job that require sustained physical and/or psychological (cognitive and emotional) effort or skills and are therefore associated with certain physiological and/or psychological costs" (Bakker and Demerouti 2007, pg. 312). So, high level job demands may create work related stresses (e.g. strain) that affect employees' job performance and health problems (Demerouti et al. 2001a).

Job Demands: Technostress and Non-technological stress

Facilitated by advanced and innovative IT-enabled technologies in firms, employees are facing more dynamic and complex organizational work environments that have become increasingly entangled with their social and work routines. These help to build their social structures within organizations (Orlikowski and Scott 2008). These environments redefine "organizational structures and business processes and have altered means of interaction among and between individuals and the organizations" (Ragu-Nathan et al. 2008, p. 417), and complicate employees' work, which blurs the boundary of roles in their work and life (Soror et al. 2015). This may create "dissatisfaction for the [employees] and loss of organizational efficiency and effectiveness" (Rizzo et al. 1970, p.152). As such, they have to face challenging of deal with uncertain and evolving emergent technologies that contribute to higher level of stress on them associated with IT use (Kinman and Jones 2005; Tarafdar et al. 2011).

In particular, technostress is related to cognitive responses of employees of using IT to meet demands from their work (Clark and Kalin 1996; Ragu-Nathan et al. 2008). Based on a study of 233 IT users, Tarafdar et al. (2011) presented five demands constituted technostress, including techno-overload, techno-invasion, techno-complexity, techno-insecurity, and techno-uncertainty. These stressors lead to a number of unintended responses, including reduction in job satisfaction, lower productivity, work overload, decreased commitment to the organization, role conflict, and role ambiguity (Tu et al. 2005; Tarafdar et al. 2007; Tarafdar et al. 2011; Ragu-Nathan et al. 2008; Ayyagari et al. 2011). As a result, technostress turns to be one of the greatest stressors that affect employees' performance in the workplace.

Other than technostress, employees also face stresses from their work and daily life. Empirical results have shown that time pressure has either positive or negative effect on individuals' decision making (Zur and Breznitz 1981), creativity (Amabile et al. 1996), and supervisor–subordinate relations (Kinicki and Vecchio 1994). Waller et al. (2001) found that the different perceptions of time pressure affect team performance to meet deadlines. Additionally, certain work environments (e.g. emergency room) may

cause emotional exhaustion because employees have to pay excessive emotions to meet a variety of demands (Zapf et al. 2001). Such exhaustion may lead to poor job performance and serious health problems like headaches and sleep disorder (Wright and Cropanzano 1998; Hülsheger et al. 2013). Based on above discussions, our propositions are presented.

P1: The interaction between technostress and non-technological stress is positively related to role ambiguity and role conflict, and negatively related to job satisfaction.

P2: The interaction between technostress and non-technological stress is positively related to health problem and negatively related to job effort.

## *Job Resources: Organizational Support and Self-efficacy*

It is important to note that job demands are not necessarily job stressors if individuals have a large pool of job resources to meet demands (Singh et al. 1994). Job resources are those functional resources for completing job tasks; they reduce job complexity caused by job demands (Demerouti et al. 2001a). So, the JD-R model assume that job resources, both individual resources and organizational resources, moderate the relationship between job demands and individual responses (Bakker and Demerouti 2007). Firms should prepare relevant resources to mitigate the impact of technostress and non-technological stress on employees. Bono et al. (2013) stated that organizing positive events and positive reflection intervention will help company to reduce employees' stress and health problems. Tarafdar et al. (2011) suggested that literacy facilitation (i.e. sharing IS related knowledge among employees within organization), technological support provision (i.e. the availability of IS professionals to support employees), technology involvement facilitation (i.e. the mechanisms that engage employees in new IT adoption and development), and innovation support (i.e. mechanisms that allow employees to explore and exploit IT facilitates) can reduce the negative effect of technostress. This leads to our next proposition.

P3a: The positive effect of job demands on technostress is weaker for employees with sufficient organizational support.

With regard to personal resources, Schaubroeck and Merritt (1997) identifies job self-efficacy as a moderator to determine whether employees can use job resources to cope with job demands. Self-efficacy refers to individual beliefs to achieve a goal (Bandura 1977). But, the environmental and individual conditions will shape their self-efficacy. In this study, we define self-efficacy as personal confidence of using technologies in workplace. Tarafdar et al. (2011) found that employees with higher technology confidence have better abilities to mitigate technostress conditions. Tarafdar et al. (2015) also found that more empowering mechanisms set such as developing technology self-efficacy, more less effects of technostress creators caused.

P3b: The positive effect of job demands on non-technological stress is weaker for employees with high technology self-efficacy.

Based on above discussions, we present our initial research model (See Figure 1).
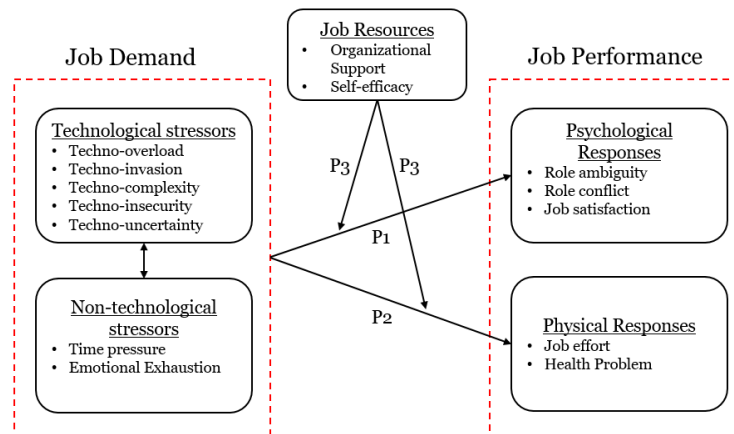
Figure 1. Research Model

Future Work and Conclusion

Our study proposes a research model for understanding the interaction between technostress and non-technological stress based on the concept of JD-R model. We believe that this study provides actionable recommendations to corporate executives in managing work stress for employees through identification of job stress dimensions in work environments. In addition to the practical implications, this research contribution to the literature in two distinct ways. First, this research intersects two streams of job stress and technostress and studies the interaction between two types of stress. While each stress type is studied separately, the interaction between them is understudied in the literature. Second, the findings of this research will help to identify how job resources such as organizational support and self-efficacy, they can alleviate the impact of technological and non-technological stress on job performance of employees.

We believe our propositions as hypotheses allows for further exploration and explanation for technostress studies. A mixed-method research with full-time employees (unit of analysis) would be recommended because it would be helpful in providinrich understanding of the phenomenon (Venkatesh et al. 2013) and there remains a gap in using mixed method approach in IS studies (Palvia et al. 2015). First, an interpretive case study within an organization will be used to obtain deeper understanding of the interaction between technostress and non-technological stress in the work process. The experiences of a single organization will be helpful in providing rich and very detailed information to address our research question (Benbasat et al. 1987) through interview discussions with employees. To ensure quality of transcripts (Mero-Jaffe 2011), respective respondents will be sent interview notes to confirm content before it was used for analysis. From the qualitative study findings, an empirically testable model along with a detailed instrument to verify the model will be developed culminating with a quantitative study.

REFERENCES

Amabile, T. M., Conti, R., Coon, H., Lazenby, J., and Herron, M. 1996. "Assessing the Work Environment for Creativity," *Academy of Management Journal* (39:5), pp. 1154-1184.

Ayyagari, R., Grover, V., and Purvis, R. 2011. "Technostress: Technological Antecedents and Implications," *MIS Quarterly* (35:4), pp. 831-858.

Bakker, A. B., and Demerouti, E. 2007. "The Job Demands-Resources Model: State of the Art," *Journal of Managerial Psychology* (22:3), pp. 309-328.

Bakker, A. B., Demerouti, E., Taris, T. W., Schaufeli, W. B., and Schreurs, P. J. 2003c. "A Multigroup Analysis of the Job Demands-Resources Model in Four Home Care Organizations," *International Journal of Stress Management* (10:1), p. 16.

Bandura, A. 1977. "Self-efficacy: Toward A Unifying Theory of Behavioral Change," *Psychological Review* (84:2), pp. 191-215.

Beehr, T. A., & Newman, J. E. 1978. "Job stress, Employee Health, and Organizational Effectiveness: A Facet Analysis, Model, and Literature Review1," *Personnel Psychology* (31:4), pp. 665-699.

Benbasat, I., Goldstein, D. and Mead, M. 1987. "The Case Research Strategy in Studies of Information Systems," *MIS Quarterly* (11:3), pp. 369-86.

Bono, J. E., Glomb, T. M., Shen, W., Kim, E., and Koch, A. J. 2013. "Building Positive Resources: Effects of Positive Events and Positive Reflection on Work Stress and Health," *Academy of Management Journal* (56:6), pp. 1601-1627.

Clark, K., and Kalin, S. 1996. "Technostressed Out? How to Cope in the Digital Age," *Library Journal* (121:13), pp. 30-32.

D'Arcy, J., Gupta, A., Tarafdar, M., and Turel, O. 2014. "Reflecting on the "Dark Side" of Information Technology Use," *Communications of the Association for Information Systems* (35:1), pp. 109-118.

Demerouti, E., Bakker, A. B., Nachreiner, F., and Schaufeli, W. B. 2001a. "The Job Demands-Resources Model of Burnout," *Journal of Applied psychology* (86:3), pp. 499-512.

Fisher, W., and Wesolkowski, S. 1999. "Tempering Technostress," *IEEE Technology and Society Magazine* (18:1), pp. 28–42.

Ganster, D. C., and Rosen, C. C. 2013. "Work Stress and Employee Health A Multidisciplinary Review," *Journal of Management* (39:5), pp. 1085-1122.

Hülsheger, U. R., Alberts, H. J., Feinholdt, A., and Lang, J. W. 2013. "Benefits of Mindfulness at Work: The Role of Mindfulness in Emotion Regulation, Emotional Exhaustion, and Job Satisfaction," *Journal of Applied Psychology* (98:2), pp. 310-326.

Kinicki, A. J., & Vecchio, R. P. 1994. "Influences on the Quality of Supervisor–Subordinate Relations: The Role of Time pressure, Organizational Commitment, and Locus of Control," *Journal of Organizational Behavior* (15:1), pp. 75-82.

Kinman, G., and Jones, F. 2005. "Lay Representations of Workplace Stress: What Do People Really Mean When They Say They Are Stressed?," *Work & Stress* (19:2), pp. 101-120.

Moore, J. E. 2000. "One Road to Turnover: An Examination of Work Exhaustion in Technology Professionals," *MIS Quarterly* (24:1), pp. 141-168.

Orlikowski, W. J., and Scott, S. V. 2008. "10 Sociomateriality: Challenging the Separation of Technology, Work and Organization," *The Academy of Management Annals* (2:1), pp. 433-474.

Palvia, P., Daneshvar Kakhki, M., Ghoshal, T., Uppala, V., and Wang, W. 2015. "Methodological and Topic Trends in Information Systems Research: A Meta-Analysis of IS Journals," *Communications of the Association for Information Systems* (37:1), pp. 630-650.

Ragu-Nathan, T. S., Tarafdar, M., Ragu-Nathan, B. S., and Tu, Q. 2008. "The Consequences of Technostress for End Users in Organizations: Conceptual Development and Empirical Validation," *Information Systems Research* (19:4), pp. 417-433.

Rizzo, J. R., House, R. J., and Lirtzman, S. I. 1970. "Role Conflict and Ambiguity in Complex Organizations," *Administrative Science Quarterly*, pp. 150-163.

Schaubroeck, J., and Merritt, D. E. 1997. "Divergent Effects of Job Control on Coping with Work Stressors: The Key Role of Self-efficacy," *Academy of Management Journal* (40:3), pp. 738-754.

Schaufeli, W. B., and Taris, T. W. 2014. "A Critical Review of the Job Demands-Resources Model: Implications for Improving Work and Health," In *Bridging Occupational, Organizational and Public Health*, Springer Netherlands, pp. 43-68.

Singh, J., Goolsby, J. R., and Rhoads, G. K. 1994. "Behavioral and Psychological Consequences of Boundary Spanning Burnout for Customer Service Representatives," *Journal of Marketing Research*, pp. 558-569.

Soror, A. A., Hammer, B. I., Steelman, Z. R., Davis, F. D., and Limayem, M. M. 2015. "Good Habits Gone Bad: Explaining Negative Consequences Associated with the Use of Mobile Phones from a Dual-systems Perspective," *Information Systems Journal* (25:4), pp. 403-427.

Tarafdar, M., Pullins, E. B., and Ragu Nathan, T. S. 2015. "Technostress: Negative Effect on Performance and Possible Mitigations," *Information Systems Journal* (25:2), pp. 103-132.

Tarafdar, M., Tu, Q., Ragu-Nathan, B. S., and Ragu-Nathan, T. S. 2007. "The Impact of Technostress on Role Stress and Productivity," *Journal of Management Information Systems* (24:1), pp. 301-328.

Tarafdar, M., Tu, Q., Ragu-Nathan, T. S., and Ragu-Nathan, B. S. 2011. "Crossing to the Dark Side: Examining Creators, Outcomes, and Inhibitors of Technostress," *Communications of the ACM* (54:9), pp. 113-120.

Tu, Q., Wang, K. and Shu, Q. 2005. "Computer-related Technostress in China," *Communications of the ACM* (48:4), pp. 77–81.

Venkatesh, V., Brown, S. A., and Bala, H. 2013. "Bridging The Qualitative-Quantitative Divide: Guidelines for Conducting Mixed Methods Research in Information Systems," *MIS Quarterly* (37:1), pp. 21–54.

Waller, M. J., Conte, J. M., Gibson, C. B., and Carpenter, M. A. 2001. "The Effect of Individual Perceptions of Deadlines on Team Performance," *Academy of Management Review* (26:4), pp. 586-600.

Wang, K., Shu, Q., and Tu, Q. 2008. "Technostress Under Different Organizational Environments: An Empirical Investigation," *Computers in Human Behavior* (24:6), pp. 3002-3013.

Zapf, D., Vogt, C., Seifert, C., Mertini, H., and Isic, A. 1999. "Emotion Work as a Source of Stress: The Concept and Development of an Instrument," *European Journal of Work and Organizational Psychology* (8:3), pp. 371-400.

Zur, H. B., and Breznitz, S. J. 1981. "The Effect of Time Pressure on Risky Choice Behavior," *Acta Psychologica* (47:2), pp. 89-104.