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Impact of Technostress on Employees' Task Performance: Moderating Role of Personality Traits

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Abstract:

In this study, we have evaluated the moderating impact of big five personality traits within the framework of Transactional Model of Stress and Coping (TMSC). This paper develops a model by integrating the moderating role of big five personality traits on the relationship of technostress and task performance of employees belonging to ICT intensive organizations and then tests this model in a developing country's context. Data were collected through a questionnaire survey from employees operating in a variety of ITC intensive firms in Pakistan. The moderating effects of big five personality traits were checked with the help of PROCESS macro for SPSS developed by Hayes (2013). Results revealed that agreeableness, consciousness and neuroticism have moderating impact on the significant negative relationship between technostress and task performance. However, extroversion and openness to experience did not moderate the relationship between technostress and task performance.

Keywords: *Technostress, Big Five Personality Traits, Task Performance, IT Extensive*

1. Introduction

Technological innovation and development has changed the way jobs and tasks are being done now-a-days. There are many technologies that are incorporated at work and have changed the way daily tasks were being performed by employees. This incorporation of technologies in the workplace has made employees to perform many tasks in a limited time period. However, this technological interaction and constant change has many effects on the daily life of professionals who are engaged with it (Khosrowpour & Culpan, 1990). Often people dealing with information and communication technology must deal with frequent technological changes and interruptions which have caused negative impact on the completion of time-dependent tasks (Tarafdar et al., 2007) thus reducing their task performance. One of the side effect of this technology driven environment is the stress faced by the professionals working in technology intensive organizations. The stress developed due to technology driven work environment is called "Technostress". Technostress can be

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described as a problem of adaptation of new technology faced by the modern world. It can further be described in two related ways first; inability to adopt and cope with new technology, and second; overexposure or interaction with the technologies (Brod, 1984).

Technostress has been studied in different fields such as in medicine (Arnetz & Wiholm, 1997), psychology (Brod, 1984; Weil & Rosen, 1997), and business organizations' environmental settings (Brillhart, 2004; Tarafdar et al., 2007; Wang, Shu, & Tu, 2008). Technostress as a term was first used in 1980's by Brod (1984). He defined Technostress as a "disease of adoption" that causes inability to cope with the new changing technology in productive manner. He also identified that overexposure or usage of technology can lead to multiple problems such as anxiety, techno-strain or techno-philia and changes the individual's behaviour and thinking pattern (Salanova, Llorens, & Cifre, 2012). Technostress is a problem experienced by every professional dealing with the technology at the workplace irrespective of the nature of the work they do. However, the occurrence is more common in time-driven tasks (Rashidi & Jalbani, 2009). In previous researches, the phenomenon of technostress has been linked to productive and other performance related outcomes (Tarafdar et al., 2007). However, previous studies have focused on the general technology interaction and characteristics (Ayyagari et al., 2011), such as involvement and innovation support (Tarafdar & Tu, 2011).

According to some studies (i.e. Towell and Lauer, 2001), technology produces a different kind of stress in different type of individuals. While relating individuals of different psychological types to different sources of stress, Moreland (1993) found that "managers who design programs to reduce their own stress may be missing opportunities to help staff who have different stress styles." These different stress styles are due to different personality types of individuals. While studying the addictive tendencies related to communication technologies, Ehrenberg et al. (2008) found personality traits as major predictors of information technology usage by young adults. The role of personality traits in dealing with stress has also been intensively studied (Grant & Langan-Fox, 2006; Sur & Ng, 2014). It has been observed that personality traits differences can result in different stress coping strategies in response to work disruptions and adaptation (Carver & Connor-Smith, 2010). Eschleman, Bowling and LaHuis (2015) has also identified the moderating

role of personality traits between the job stressors and job outcomes. Similarly, Schneider, Rench, Lyons, and Riffle (2012) argue that personality traits effect stress responses differently. Irrespective of what causes and prevents technostress, it is observed that it adversely reduces the work productivity of the employees (Tarafdar & Tu, 2011).

Prior research has provided the insight regarding the impact of technostress on job related outcomes, however, there is a limited research focus on the impact of personality traits on the relationship of technostress and job-related outcomes of individuals (Srivastava, Chandra, & Shirish, 2015). In this study, while grounding the research on transactional model of stress and coping, we have presented the moderating role of big five personality types on the relationship of technostress and job performance of employees. There are two major contributions of the research, firstly by incorporating the role of personality differences, this study will provide insight about how to deal with the technostress of different personality types. The results will provide managers with information about how and why to pay special attention while allocating specific tasks to employees having particular personality type. Secondly, as majority of the literature on technostress is coming from Europe and America, while using data from information technology and communication firms operating in Pakistan, this study will help in the generalizability of the of these theoretical and empirical concepts.

2. Literature Review

2.1. Transactional Model of Stress and Coping

According to transactional model of stress by Cooper, Dewe, and O'Driscoll (2001) stress can be explained with the help of four mechanisms i.e. stressors, strain, situational factors and outcomes. Stressors are all those situations and events that hold the possibility of causing a stress in an individual. These stressful situations or stressors in terms of daily usage of technology by employees, include constant changes in the work, technology and invasion into employee's personal life. Cooper et al. (2001) defines situational factors that are part of organizational process and system e.g. the involvement of employees with the changing technology or work conditions and technology related training programs. In terms of the technology usage, Cooper et al. (2001) define strain as a response (emotional and behavioural)

that has arisen due to stressors. Typically, these responses are in the form of uneasiness, tiredness and detached behaviour shown by the employee working in a technological environment (Salanova, Llorens, Cifre, MartÍNez, & Schaufeli, 2003).

Similarly, the model proposed by Lazarus and Folkman (1984) known as the transactional model of stress and coping explains the process of how people experience stress differently. The stress models explained in occupational researches such as environment fit theory (Edwards, Caplan, & Van Harrison, 1998), cybernetic theory (Cummings & Cooper, 1998), and control theory (Spector, 1998), unfortunately did not include the possibility of positive outcomes of technostress that could be caused by personality differences as explained in the study done by Le Fevre et al. (2003). Ragu-Nathan et al. (2008) have used the model proposed by Le Fevre et al. (2003) while explaining technostress. This model is based on mental paradigm involving the relationship that exists between environment's demands and variation in individual responses. According to Lazarus and Folkman (1984), every individual interprets his or her environment differently. Hence, stress is a transactional process or the outcome of the transaction process that happens between an individual and his or her environment and the power that binds or forms a relationship between the individual and his/her environment is known as appraisal (Lazarus, 2001).

Lazarus (2001) defines two types of appraisals, one is called primary appraisal and other is called secondary appraisal. He further explains that the reason why people react differently in stressful situations is due to these two appraisals. These appraisals define stress phenomena and represent a process through which an individual goes through when encounters with stressful situations and thus help in determining the individual's emotional and behavioral reaction, and type of stressful experience (Lazarus, 2001).

The primary appraisal is performed when an individual realizes that something is at risk. This is the evaluation process based on personal and subjective experiences where an individual assesses its current environment and wonders if there is something at stake. There are four forms of primary appraisal explained by Lazarus (2001) including harm/loss, threat, challenge and demand. Lazarus (2001) defines harm/loss appraisal as that is already being done and the individual is evaluating the situation. Threat appraisal is defined as something that is about to happen and challenge is when an individual is encountered with the demand posed by the

environment. The fourth appraisal, benefit is defined as possible benefit that an individual expects from the encountered demand. Later, Dewe, O'Driscoll, and Cooper (2010) explained the association of different emotions related to appraisals (negative and positive, both). These were explained as coping strategies of individuals.

After the primary appraisal, there comes secondary appraisal which is an individuals evaluation of certain event that has been occurred. When the person has evaluated the situation, he thinks what to do about this situation now, what would be the next step. Studies done by Al-Fudail and Mellar (2008) and Ragu-Nathan et al., (2008) have used primary and secondary appraisal phenomena for explaining the antecedents and outcomes of technostress. Aayyagari et al. (2011) linked these appraisals to the reasoning ability of the human being that explains the transactional process in terms of individual-environment interaction.

In terms of technological usage, this theory explains the stress experienced by employees due to different technological encounters. When demand for the use of technology in performing tasks exceeds the person's abilities, it will lead toward technostress which will eventually pose a threat to both mental and physical health of that person (Ayyagari et al., 2011). In technological context, the stressful or demanding situations for employees could be a job mail or message that is intruding personal life or simply use to some technological tool to which one is not accustomed of using. These types of situations can further be aggravated by work conditions (daily hassles, extra workload etc.). The evaluations and coping actions in response to these disruptive events (technostress creators) in a work place differ from one personality to another (Lazarus & Folkman, 1984). Different personality types behave differently under these types of stressful situations. In response to these environmental demands (work stressors), employees show emotional and cognitive reactions which may have impact on job related outcomes (i.e. low task performance).

While studying the techno-overload and communication over-load in mobile environment Hung, Chen and Lin (2015) found that proactive personality mitigates the negative effects of technostress on individual's productivity. Similarly, Srivastava, Chandra, and Shirish (2015) have also identified the moderating role of personality traits (Big Five) on the relationship of technostress and job-related

outcomes including job burnout and job engagement. As we have very limited literature available on whether personality types can mitigate the negative consequences of technostress on employee task performance, this study will help to fill this gap and will contribute towards growing body of knowledge on technostress. In the current study, we have used the transactional model of stress and coping as ground and have proposed the big five personality types as having moderated impact on the relationship of technostress and task performance of individuals.

2.1.1. Technostress and Performance

Technostress is experience by employees because of overexposure and increased usage of technology in their daily work and is linked with causing strain in them (Ungku & Salmiah, 2010). Technostress is also defined as an opportunity cost that human must pay to use technology (Champion, 1988). To further describe the technostress, certain symptoms were identified such as computer anxiety, headaches, joint aches and insomnia etc. (Brod, 1984). Similarly, according to Weil and Rosen, (1997), there is an indirect link of technostress with human psychology and can have impact on job related outcomes.

Job performance is one of the major job-related outcomes that managers have focused on and are interested to enhance in their subordinates. There are two dimensions of job performance, task performance and contextual performance. Task performance is defined as core duties and responsibilities, whereas, contextual performance is defined as factors of the job that improve overall performance of the employees and organizations (Borman & Motowidlo, 1993). As technostress is more related to the tasks and is also time bound, the focus of current study was the task performance only. Task performance with reference to technology intensive environment in organizations can be defined as the successful completion of the job activities by the employees that contribute to the technical essentials in these organizations (Borman & Motowidlo, 1993).

Organizations are constantly engaging in finding and adopting new technological means to carry out daily tasks and procedures. This daily interaction of individuals with technology is ultimately increasing negative effects (Ragu-Nathan et al., 2008). This state of constant struggle with technology can cause disruptions in daily working pattern and can slow worker's response time (Brod, 1984). Thus, causing low productivity and job performance among employees (Sinha, 2012). Fuglseth

and Sørebø (2014) studied the impact of the technostress using information technologies consistently in their daily work on job tasks of the employees and managers. The results show negative effect of these technologies on job tasks of the employees. Technologies, such as mobile computing devices require individual to do multitasking resulting in information fatigue. The fatigue is caused because of different intrusions and disturbances which occurs due to multitasking and resulted in frustration. Other than that information interruptions such as emails, messages and other office communications put more pressure on employees as they are required to respond as soon as they receive it and hence, resulting into anxiety and stress in them (Agboola & Olasanmi, 2016). Based upon the above empirical and theoretical findings, following hypothesis is proposed:

H1: Technostress has a negative impact on Task Performance of the employees.

2.2. Moderating role of Personality Traits

2.2.1. Agreeableness

Individuals with this trait tend to be more inclined towards making interpersonal relations, creating harmony and less conflicts (McCrae & Costa, 1991). Such individuals can be described as kind and helpful (Graziano & Eisenberg, 1997). These individuals are more facilitating and accommodating towards using the technology in their daily work tasks (Devaraj et al., 2008). Due to a high level of agreeableness, these individuals agree to work and adjust with the change, even though they might not have required skills, and that is why they may perceive stress situations differently (Michel, Clark, & Jaramillo, 2011).

A study done by Meier, Robinson, and Wilkowski (2006) revealed that people with high agreeableness show resistance towards the aggressive cues and through prosocial thought they can reduce the effects of negative cues. Thus, supporting the role of agreeableness as moderator as people with low agreeableness were sensitive towards negative cues.

This trait is considered key component in maintaining the interpersonal relationship (Yang, Guo, Lee, & Vogel, 2013). This trait is positively associated with the teamwork performance. Individuals with this trait have attributes like thoughtfulness, and kindness which are related to increase job performance (McCrae & Costa, 1991). Previous studies showed that job performance can be best predicted

by this trait (Yang & Hwang, 2014). Thus, individuals with high level of agreeableness will show positive attitude towards technology usage in daily work, as they do not complain and try to adjust accordingly. From above mentioned literature, following hypothesis is formed.

H2: Agreeableness positively moderates the relationship between Technostress and Task performance of the employees.

2.2.2 Conscientiousness

Individuals with this trait can be described as people who pay great attention to detail and put a lot of effort to achieve success (Barrick & Mount, 1991). These individuals are high in attributes of self-control and persistency. They strive for achievement and order in life (Costa, McCrae, & Dye, 1991). The study done by Barrick and Mount (1991) showed that job performance can be predicted by conscientiousness. As these individuals are predisposed to increase their job performance and they show acceptance towards the use of new technologies because they perceive them as opportunities to improve themselves. Thus, these individuals take technostress situations as positive situations which will increase their performance. They experience technostress as positive stress (Eustress- term use for positive stress, first used by Selye in 1975). Thus, such individuals pay great attention to detail and strive for excellence and efficiency they will see technological stress as a challenge to improve their job performance (Costa et al., 1991).

Previous Studies showed that individuals with this trait can be defined as trustworthy, reliable and dependable. These individuals tend to follow company rules and regulations and they have a sense of duty (Lounsbury et al., 2012). Studies have showed that Conscientiousness positively contributes towards the different outcomes (such as good psychological health) (Takahashi, Edmonds, Jackson, & Roberts, 2013). Hence following hypothesis is formed.

H3: Conscientiousness positively moderates the relationship between technostress and Task performance of the employees

2.2.3. Extroversion

Individuals with this trait can be described as extrovert who are outgoing and active. These individuals tend to maintain close interpersonal relationships (Watson & Clark, 1997). The study done by Devaraj et al. (2008) showed that these

individuals have great drive to maintain positive social image in their organization by showing positive and active attitude towards using new technologies.

People with extrovert personality tend to be social, talkative, and outgoing (Lounsbury et al., 2012) and have strong drive of achieving success and power and show risk taking behavior (Barry & Stewart, 1997). These individuals also tend to be dominant in social situations (Peeter, Rutte, van Tuijl, & Reymen, 2006).

The study done by Devaraj et al. (2008) showed that people who are extrovert, do not show any resistance towards using technology at work instead they show positive behaviour. It is also observed that people with high extroversion perceive stress situations (technostress creators) as opportunity to increase their performance (Srivastava et al., 2015).

According to the TMSC theory, these individuals will take technostress or technostress creating situations as an opportunity to increase their performance. As these individuals are predisposed towards improving their image and lowering stress experiences and exhaustions. Thus, these individuals show positive attitude and increased job performance. Hence following hypothesis is formed.

H4: Extroversion positively moderates the relationship between technostress and Task performance of the employees.

2.2.4. Neuroticism

This trait could be described with the attributes of uncertainty, anxiety, insecurity and aggressiveness. Individuals with a high level of this trait are aggressive, anxious, self-conscious and depressed. Such individuals show negative emotions towards work-related changes. This trait is explained in the literature with the attributes like anxiousness, worry and individual that experience negative emotions easily (Srivastava et al., 2015).

Previous studies define this trait as attributes that affect job behaviour. A study done on pilots by Stokes (1995) revealed that experienced pilots with high anxious trait did not show low performance when encountered stressed situations, but pilots with no experience and high anxious personality did show some. Individuals with a high level of anxious personality trait tend to be more attentive towards threats (White & Delk, 2016). Thus, it can be said that these people will identify the threat beforehand and will adopt coping strategies to lessen its effect on their performance. As suggested by Beck (1979) that people who get anxious are more vulnerable to

threats. Also, results of the study conducted by Allik and McCrae (2004) showed that Asian countries are high in neuroticism trait in predicting performance outcomes. Hence, following hypothesis is formed.

H5: Neuroticism positively moderates the relationship between technostress and Task performance of the employees.

2.2.5. Openness to Experience

Individuals with the personality trait of openness-to-experience are easy-going, flexible and open-minded towards new ideas. These Individuals have high level of curiosity and are willing to try different and new things. Previous studies described these individuals as creative, having great aesthetic sense, explorative, sympathetic, and eccentric (McCrae & Costa, 1991). The study done by Judge, Heller, and Mount (2002) described them as individuals with high level of divergent and scientific thinking. Another study done by Barrick et al. (2001) identified that individuals with high level of this trait tend to be proficient in learning new experiences and enjoying new trainings. In organizational context, individuals with this trait are open to new ways of working (such as new technology) and show positive attitudes towards work-related technologies and stresses (Devaraj et al., 2008).

In literature, this trait is positively associated with job performance (Lounsbury et al., 2012), as these people are creative and keen to learn new things and experiences (Yang & Hwang, 2014). Further studies describe these individuals as flexible and easy going and identified as healthier people (Yahaya, Yahaya, Bon, Ismail, & Noor, 2012).

Openness to experience trait, has previously been described as imaginative and keen towards experiencing new things and curiosity (McCare & John, 1992), people with this trait are more inclined towards positive attitude associated with the usage of the technology and related stress (Devaraj et al., 2008). Study done by Srivastava et al. (2015) showed that these people show positive attitude and experience with technostress creators which could impact their performance. Hence, following hypothesis is formed.

H6: Openness to experience positively moderates the relationship between technostress and task performance of the employees.

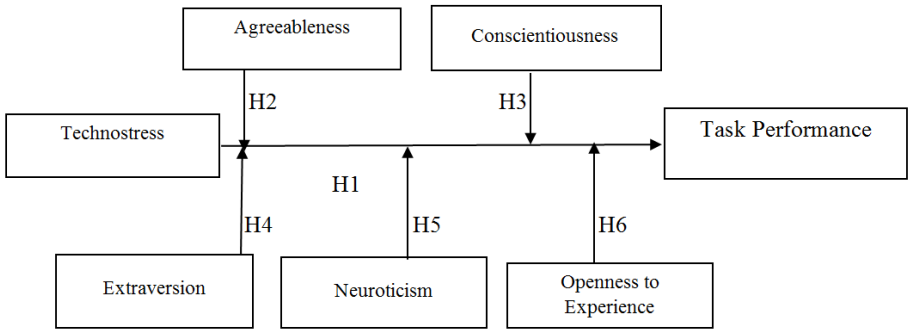

Figure 1: Theoretical Framework

3. Research Methodology

3.1. Instrument Development

Technostress was measured with the help of 19-item scale developed by Popoola et al. (2013). Each statement was rated on "1" Not at All, "2" Sometimes, "3" Often, and "4" Very Often. This technostress scale is reliable with Cronbach Alpha value of 0.95. For the measurement of Big-Five personality traits including extraversion, agreeableness, neuroticism, openness to experience and conscientiousness, the scale was adopted from Srivastava et al. (2015). This instrument is used to identify five different personality types based on personality attributes.

Task Performance was measured with the help of 4 items developed by Torkzadeh and Doll (1999) with a Cronbach Alpha of 0.91. This scale was used to measure the technology related task performance of the employees. These Items were measured on five-point Likert scale ranging from Strongly Disagree = 1, Disagree = 2, Neither Agree/ Nor Disagree = 3, Agree = 4 to Strongly Agree = 5.

3.2. Procedure and participants

For the current study, a total of 500 questionnaires were distributed in six information technology and communication intensive organizations having either head office or regional office in Rawalpindi and Islamabad. Out of 500 distributed questionnaires, 290 fully filled usable questionnaires (without missing values) were received back resulting into 58% response rate. As data were collected through self-administered questionnaire, hence this response rate is acceptable. The demographic profile of respondents is presented in Table 1.

Table 1. Demographic Profile of Respondents

Variable	Construct	Frequency	Percentage
Gender	Male	220	75.3
	Female	70	24.7
Age	21 - 25 Years	81	27.7
	26 – 30 Years	123	42.1
	31 – 35 Years	67	22.9
	36 - 40 Years	15	5.1
	Above 40	4	1.4
Experience	Less than 1 Years	61	20.9
	1-4 Years	166	56.8
	5-8 Years	41	14.0
	9 – 12 Years	11	3.8
	Above 12 Years	4	1.4

4. Data Analysis

4.1. Statistical Assumptions of Regression and Moderation Analysis

Data is first subjected to statistical test for fulfilling the basic assumptions of simple regression and for testing of set of hypotheses, we have used PROCESS macro developed by Hayes (2013) for SPSS Model 1 is simple moderation model with 5000 bootstrap confidence intervals, with the help of this model moderating impact of different personality types on technostress and task performance have been assessed.

4.1.1. Normality

For the Regression and moderation analysis, data should have been univariate. Univariate normality can be accessed through following tests; Kolmogorov-Smirnov, Shapiro-Wilk, and Skewness and Kurtosis. Skewness and Kurtosis indices which should lie between the absolute value of 3 and 10 respectively (Kline, 2005). The p-value of Kolmogorov-Smirnov, Shapiro-Wilk of all the variables is significant as it is less than 0.05 ($p<0.05$) except for neuroticism. The skewness values for the current data lies between -1.233 to 0.645 while kurtosis values were between -0.473 to 0.898 hence showing univariate normality in the data set.

4.1.2. Reliability

Cronbach's Alpha values were used to check the internal consistency and reliability of each construct. The Alpha coefficient values were calculated using SPSS 17. The Alpha coefficient of overall scale was 0.923 while it ranged between

0.90 and 0.82 for each construct separately, indicating the scale as reliable (Cronbach, 1951; Nunnally, 1978). The Cronbach's Alpha value for each latent variable is given in Table 2.

4.1.3. Common Method Variance

Self-reported data raise issue of the potential effect of common method variance (CMV) (Podsakoff et al., 2003). Prior to hypothesis testing, CMV was tested using Harman's one factor test. When all items were loaded in principal component factor analysis, 5 factors with "Eigen value" greater than 1 were formed and the first factor accounted for less than 50% variance. The result revealed that data is free from CMV

4.1.4. Scale Validation

The psychometric properties of the measures were examined through CFA (Confirmatory Factor Analysis) based on the seven-factor structure model, namely technostress, task performance, agreeableness, conscientiousness, extrovert, neuroticism and openness to experience. The CFA resulted in an acceptable fit (GFI = .87, CFI = .90, TLI = .93, RMSEA = .063 and $\chi 2 = 398$, df = 231, $p<.001$). All indicators loaded significantly ($p<.001$) on their respective constructs and provided evidence of convergent validity. The results are presented in Table 2.

The discriminant validity was assessed by comparing the shared variance which is the squared correlations and the average variance extracted (AVE). For all constructs, the AVE was greater than the shared variance (see Table 3) thus indicating that the discriminant validity in all cases had been achieved (Fornell & Larcker, 1981).

4.2. Regression Analysis

For the testing of first hypothesis, simple linear regression analysis was conducted using SPSS (version 20). For this analysis, aggregate values of technostress and task performance were used. The results revealed that technostress has significant negative impact on task performance of employees working in ICT intensive organizations. Results of this analysis are presented in Table 4.

The standardized regression weights, also known as beta weights are used for the assessment of technostress negative (inverse) impact on Task performance of the employees working in ICT intensive firms. Effect size greater than 0.5 is considered to be large whereas between 0.5 and 0.1 is considered as moderate (Kline, 2005). The results indicate that technostress has moderate level of negative (inverse) impact

on Task performance of the employees. This means when technostress experienced by the employees is high, the task performance of the employees will be low. And when there is low technostress the task performance will be higher.

4.3. Moderation Analysis

We have used PROCESS macro developed by Hayes (2013) for SPSS for moderation analysis. We used PROCESS macro particularly due to the fact that PROCESS allows testing of moderating role of variables with bootstrap confidence intervals. Big five personality traits were treated as separate constructs.

The moderation results of the big five personality types indicate mixed findings. The results showed that Agreeableness, Conscientiousness and Neuroticism moderate the negative relationship between technostress and task performance. Whereas, extroversion and openness to experience show no moderating effect on technostress and task performance relationship. Results are presented in Table 5.

Table 2. Confirmatory Factor Analysis (CFA) of items present in model

Construct/Variable	β	Alpha	CR	AVE
Technostress		**.87**	**.87**	**.70**
TS1	0.750			
TS2	0.774			
TS3	0.729			
TS4	0.699			
TS5	0.721			
TS6	0.730			
TS7	0.743			
TS8	0.784			
TS9	0.798			
TS10	0.778			
TS11	0.798			
TS12	0.787			
TS13	0.722			
TS14	0.686			
TS15	0.622			
TS16	0.704			
TS17	0.617			
TS18	0.740			
TS19	0.730			
Agreeableness		**.90**	**.89**	**.63**
AG1	0.881			
AG2	0.660			
AG3	0.730			
Conscientiousness		**.82**	**.86**	**.60**
CON1	0.669			
CON2	0.857			
CON3	0.887			
Extroversion		**.88**	**.89**	**.72**
EXT1	0.631			
EXT2	0.824			
EXT3	0.918			
Neuroticism		**.89**	**.89**	**.68**
NEU1	0.637			
NEU2	0.894			
NEU3	0.665			
Openness to Experience		**.84**	**.87**	**.70**
OPE1	0.764			
OPE2	0.799			
OPE3	0.607			
Task Performance		**.86**	**.86**	**.72**
TP1	0.824			
TP2	0.881			
TP3	0.920			
TP4	0.882			

β: standardized Coefficient, Alpha: Cronbath's Alpha, CR: Composite Reliability, AVE: Average Variance Extracted

Table 3: Descriptive Statistics, Correlations, Shared Variance and AVE for Constructs

Variable	No of items	Mean	S.D.	1	2	3	4	5	6	7
TS	19	1.77	0.55	**.70**						
AGR	3	4.63	0.46	-.10 (.01)	**.63**					
CON	3	4.73	1.20	-.19 (.04)	.39* (.15)	**.60**				
EXT	3	4.62	1.03	-.26 (.07)	.34* (.12)	.70* (.49)	**.72**			
NEU	3	3.99	1.18	.19 (.04)	.20* (.04)	.06 (.003)	.13 (.02)	**.68**		
OPE	3	4.86	1.28	-.28* (.09)	.33* (.11)	.52* (.27)	.61* (.37)	.25* (.06)	**.70**	
TP	4	3.97	1.13	-.35* (.12)	.21* (.04)	.38* (.14)	.30* (.09)	.09 (.01)	.40* (.16)	**.72**

Shared variance in parenthesis; AVE in diagonal, P <0.05, S.D.: Standard deviation, TS: Technostress; AGR: Agreeableness; CON: Conscientiousness; EXT: Extroversion; NEU: Neuroticism; OPE: Openness to Experience; TP: Task Performance

Table 4: Simple Linear Regression Analysis

Variable	Unstandardized Coefficients Beta	Standardized Coefficients Beta	t-value	p-value
TS	-.720	-.355	-5.69	.000

Note: R= .355, R^2=.126, F (1,225) =32.386, a. Dependent Variable: Task performance

Table No. 5. Moderated Analysis (PROCESS Model 1) Bootstrap (5000 re-sample) Results

Model						Task Performance		
	B	SE	t-value	p-value	LLCI	ULCI	R^2	ΔR^2
AGR	.12	.05	2.29	.02	.02	.222\	.13	.01
TS	-.60	.13	-4.45	.00	-.86	-.33		
TS_X_AGR	.19	.08	2.23	.02	.00	.39		
CON	.22	.06	3.66	.00	.10	.34	.21	.03
TS	-.68	.12	-5.42	.00	-.93	-.43		
TS_X_CON	.34	.12	2.91	.00	.11	.58		
EXT	.09	.06	1.51	.13	-.02	.22	.14	.01
TS	-.72	.13	-5.25	.00	-.99	-.45		
TS_X_EXT	.18	.15	1.19	.23	-.12	.49		
NEU	.13	.04	2.84	.00	.04	.22	.157	.02
TS	-.78	.13	-5.81	.00	-1.0	-.51		
TS_X_NEU	.24	.08	2.82	.00	.07	.41		
OPE	.22	.05	4.25	.00	.12	.33	.19	.01
TS_X_OPE	-.59	.13	-4.29	.00	-.87	-.32		
	.21	.12	1.70	.09	-.03	.45		

Note. β = Standardized regression coefficient; CI = Confidence Interval; LL = Lower Limit; UL = Upper Limit.

The results of moderation analysis revealed that the interaction terms for Agreeableness (TS_X_AGR) β =.1988 (p-value ≤ 0.05), Conscientiousness (TS_X_CON) β = .3488 (p-value ≤ 0.01) and Neuroticism (TS_X_NEU) β = .2454 (p-value ≤ 0.01) are significant and positive and as there is no zero between upper and lower bound of bootstrap 95% confidence interval (LLCI and ULCI) which means Agreeableness, Conscientiousness and Neuroticism moderate the relationship between Technostress and Task performance. Hence, Hypothesis H2, H3 and H5 are accepted.

Whereas coefficients of interaction terms of Extroversion (TS_X_EXT) is β = .1858 (p-value ≥ 0.05) and Openness to Experiences (TS_X_OPE) is β = .2123 (p-value ≥ 0.05). These coefficients are insignificant and zero lies between upper and lower bound of bootstrap 95% confidence interval (LLCI and ULCI). Thus, the data is unable to provide support for the hypotheses related to extroversion and openness to experience hence, Hypotheses H4 and H6 are not supported.

Table 6 shows the summary of the all the hypotheses developed in literature review and their results based on analysis of collected data.

Table 6: Summary of Results

Hypothesis	Results
H1: Technostress has negative impact on Task performance of the employees	Accepted
H2: Agreeableness positively moderates the relationship between technostress and task performance of the employees	Accepted
H3: Conscientiousness positively moderates the relationship between technostress and task performance of the employees	Accepted
H4: Extroversion positively moderates the relationship between technostress and task performance of the employees.	Not Accepted
H5: Neuroticism positively moderates the relationship between technostress and task performance of the employees	Accepted
H6: Openness to experience positively moderates the relationship between technostress and task performance of the employees	Not Accepted

The result of the study indicates buffering effect of these three personality traits on the negative relationship of the technostress and task performance. That is when people are high in agreeableness, conscientiousness, and neuroticism, the relation between technostress and task performance is weakened. To better understand the significant interaction effect between Technostress and Conscientiousness, significant interaction graph was plotted in MD2C Excel template (Hayes, 2013).

The graphs show that the lines are not parallel which means that interaction effect of technostress and Agreeableness, Conscientiousness, and Neuroticism on Task Performance exists.

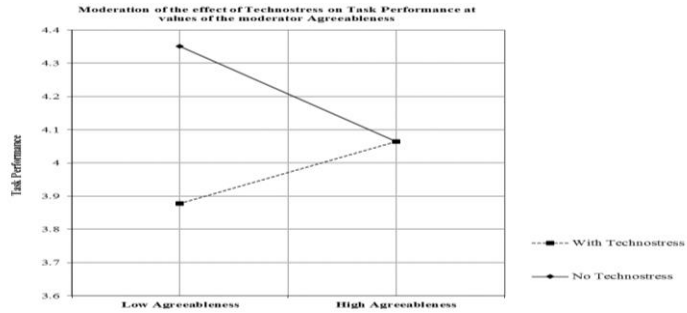

Figure 2: Graph 1. Interaction Effects

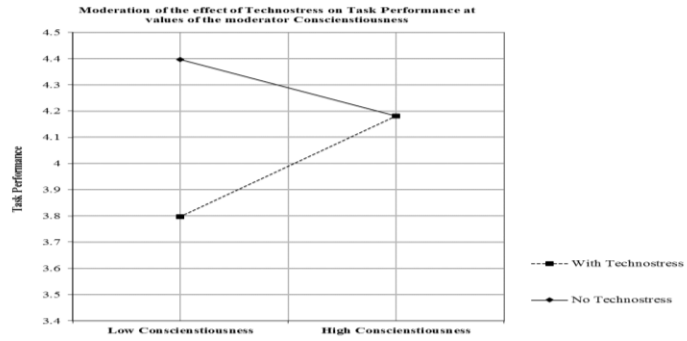

Figure 3: Graph 2. Interaction Effects

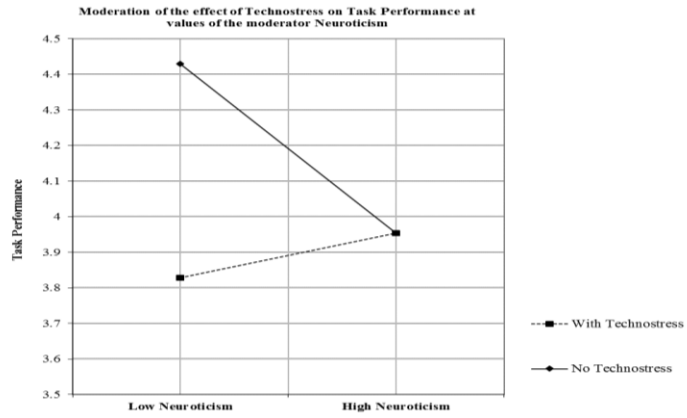

Figure 4: Graph 3. Interaction Effects

These graphs are indicating that the performance increases in presence of technostress when agreeableness, Conscientiousness, and Neuroticism are high while it decreases when these three personality traits are low, and technostress exists in employees.

5. Conclusion and Recommendations

The aim of the current study was to investigate the impact of technostress on task performance while taking big five personality traits as moderator. The purpose of the study was to fill the gap that was identified from prior literature on the impact of technostress and job-related outcomes with inclusion of personality traits (Srivastava et al., 2015). The current study used transactional model of stress and coping (Lazarus, 1984) as a theoretical base. The proposed hypotheses of the model were tested taking Big Five Personality trait dimensions as separate constructs.

The results indicated that technostress has significant negative (inverse) impact on Task performance of the employees working in ICT intensive firms. This result is consistent with the studies of Tarafdar et al. (2007) and Tarafdar et al. (2011) who have studied inverse relationship between technostress and individual productivity. Weinert (2016) also found that when individuals receive excessive emails and messages, they experience negative psychological effect such as anxiety which reduces their performance. It has been identified that increase in technological anxiety and stress are one of the main causes for the reduction of work performance in employees. One plausible explanation of increased anxiety and tension could be due to increase in ICT inclusion at work which has caused employees to be available 24/7 and to work harder than before to meet new technological demands (Suh & Lee, 2017).

One of the most important findings of the current study is related to the insignificant moderating impact of extroversion and openness to experience on the relationship of technostress and task performance. Extroversion and openness to experience are the two personality dimensions that have been identified as "not clearly understood in Asian countries" like Pakistan (Allik & McCrae, 2004; McCrae et al., 2005; Schmitt et al., 2007). The reason for low score on Extroversion in Asian countries is because of the cultural differences of the individualistic and collectivistic societies. These cultural differences affect the way people interpret and define

extroversion trait (Jaiswal, 2014). Results of our study also identify this cultural variation in interpretation of different concepts by different personalities. It has also been identified that countries on low in power distance show more individual variations cross big five personality traits (Bartram, 2013) than countries with high power distance (like Pakistan). As in countries with high power distance, customs, opinions and cultural values effect the individual behaviour and they appear to be dominant across Asian countries (Bartram, 2013).

Similarly, openness to experience take different meaning in Asian countries and it even differs across Asian countries (Cheung et al., 2001). Other than cultural differences there also exist language barriers and how these traits are interpreted in Asian countries. As in Asian countries cultural values play important role in shaping people's personality, but the attributes of the extroversion like outgoing, social and attribute of openness to experience like unconventional are not that common and prominent trait or represented traits of Pakistani culture. Thus, the above-mentioned studies provide ample explanation and supporting for the insignificant results of extroversion and openness to experience as a moderator between technostress and task performance in Pakistani setting.

The current study clearly indicates that technology is the part of the everyday life and daily interaction of the employees with technology has negative effects on their task performance. As it has been observed that individual's ability to cope stress also differs depending upon the personality traits of the individuals (Hung et al., 2015). The study also highlights the important role that personality traits play in weakening this negative impact of the technological stress on task performance of the employees. It also describes the mechanism that different personalities adopt to cope with technological stress differently while not sacrificing their task performance. The results identified that employees with high agreeableness trait (kind, helpful and accommodating (John & Srivastava, 1999; Graziano et al., 2007)) experience less technostress. This might be due to their helpful and accommodating attitude towards technological changes and stress situations (Srivastava et al., 2015) thus their performance is not to be effected by technostress.

Individuals with Conscientiousness trait can be described as people who pay great attention to detail and put a lot of effort to achieve success (Barrick et al., 2001). These individuals are high in attributes of self-control and persistency. They strive for achievement and order in life (Costa et al., 1991). Previous studies showed

that individuals with this trait can be defined as trustworthy, reliable and dependable. The study done by Hassan, Akhtar, and Yılmaz (2016) on conscientiousness and job performance showed that people with high conscientiousness show high task performance than people with low conscientiousness. The current study not only validates the previous findings but also emphasizes that of all the personality traits, conscientiousness predicts the job performance better in Pakistani society. Thus, it is empirically proved that employee with high level of Conscientiousness will lessen the negative factors associated with the technology and they will focus on how they can use technology in a productive way in their daily office work.

The results of the current study showed that Neuroticism trait positively moderates the relationship between technostress and task performance. One of the plausible explanation for the result of the current study could be that individuals with high level of anxious personality trait tend to be more attentive towards threats (White & Delk, 2016). Thus, it can be said that these people will identify the threat beforehand and will adopt coping strategies to lessen its effect on their performance.

By adding personality traits in the model of technostress and task performance, the study provides new insights toward understanding the stress experienced by employees in office settings. Thus, by understanding the impact of technostress along with personality traits can be helpful for the management in the development of stress management strategies such as coping mechanism, and employee intervention programs. This study is also helpful in highlighting the other grey areas and adverse effect (physical pain and anxiety) of the technology in the office setting and how it can reduce employee productivity which will help managers in finding solutions to these technologies related problems. The results of this study can be used as a basis in future researchers of technostress as technostress is emerging research topic and a very limited empirical studies are done in developing country context.

Future researchers can include dimensions of the technostress (such as technology hassles) to identity its impact on task performance as studies are conducted at organizational level that showed technological break downs caused stress among employees (Day, Paquet, Scott, & Hambley, 2012). Future researches can also target the factors that cause technostress (antecedents of technostress) among employees which can also directly affect task performance of the employees.

Also, the task performance questionnaire was self-validating/ evaluating which can bring biased results, future researchers can use questionnaire for task performance that is evaluated from managers or from monthly reports/ annual reports.

References

Agboola, A. A., & Olasanmi, O. O. (2016). Technological Stressors in Developing Countries. *Open Journal of Applied Sciences*, *6*(04), 248-259.

Al-Fudail, M., & Mellar, H. (2008). Investigating teacher stress when using technology. *Computers & Education*, *51*(3), 1103-1110.

Allik, J., & McCrae, R. R. (2004). Toward a geography of personality traits: Patterns of profiles across 36 cultures. *Journal of Cross-Cultural Psychology*, *35*(1), 13-28.

Arnetz, B. B., & Wiholm, C. (1997). Technological stress: Psychophysiological symptoms in modern offices. *Journal of Psychosomatic Research*, *43*(1), 35-42.

Ayyagari, R., Grover, V., & Purvis, R. (2011). Technostress: technological antecedents and implications. *MIS Quarterly*, *35*(4), 831-858.

Barrick, M. R., & Mount, M. K. (1991). The big five personality dimensions and job performance: a meta-analysis. *Personnel Psychology*, *44*(1), 1-26.

Barrick, M. R., Mount, M. K., & Judge, T. A. (2001). Personality and performance at the beginning of the new millennium: What do we know and where do we go next?. *International Journal of Selection and Assessment*, *9*(1-2), 9-30.

Barry, B., & Stewart, G. L. (1997). Composition, process, and performance in self-managed groups: The role of personality. *Journal of Applied Psychology*, *82*(1), 62-78.

Bartram, D. (2013). Scalar equivalence of OPQ32: Big Five profiles of 31 countries. *Journal of Cross-Cultural Psychology*, *44*(1), 61-83.

Borman, W. C., & Motowidlo, S. M. (1993). Expanding the criterion domain to include elements of contextual performance. *Personnel Selection in Organizations; San Francisco: Jossey-Bass*, 71-98.

Brillhart, P. E. (2004). Technostress in the workplace: Managing stress in the electronic workplace. *Journal of American Academy of Business*, *5*(1/2), 302-307.

Brod, C. (1984). *Technostress: The human cost of the computer revolution*. Addison Wesley Publishing Company.

Carver, C. S., & Connor-Smith, J. (2010). Personality and coping. *Annual Review of Psychology*, *61*, 679-704.

Champion, S. (1988). Technostress: Technology's Toll. *School Library Journal*, *35*(3), 48-51.

Cheung, F. M., Leung, K., Zhang, J. X., Sun, H. F., Gan, Y. Q., Song, W. Z., & Xie, D. (2001). Indigenous Chinese personality constructs: Is the five-factor model complete?. *Journal of Cross-Cultural Psychology*, *32*(4), 407-433.

Cooper, C. L., Cooper, C. P., Dewe, P. J., O'Driscoll, M. P., Dewe, P. J., & O'Driscoll, M. P. (2001). *Organizational stress: A review and critique of theory, research, and applications*. Sage.

Costa Jr, P. T., McCrae, R. R., & Dye, D. A. (1991). Facet scales for agreeableness and conscientiousness: A revision of the NEO Personality Inventory. *Personality and individual Differences*, *12*(9), 887-898.

Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika*, *16*(3), 297-334.

Cummings, T. G., & Cooper, C. L. (1998). A cybernetic theory of organizational stress. *Theories of Organizational Stress*, 101-121.

Day, A., Paquet, S., Scott, N., & Hambley, L. (2012). Perceived information and communication technology (ICT) demands on employee outcomes: The moderating effect of organizational ICT support. *Journal of Occupational Health Psychology*, *17*(4), 473-491.

Devaraj, S., Easley, R. F., & Crant, J. M. (2008). Research note—how does personality matter? Relating the five-factor model to technology acceptance and use. *Information Systems Research*, *19*(1), 93-105.

Dewe, P. J. O‟ Driscoll, MP, & Cooper, CL (2010). *Coping with Work Stress. A Review and Critique*.

Edwards, J. R., Caplan, R. D., & Van Harrison, R. (1998). Person-environment fit theory. *Theories of Organizational Stress*, *28*-67.

Edwards, J. R., Caplan, R. D., & Harrison, R. V. (1998). Person-environment fit theory: Conceptual foundations, empirical evidence, and directions for

future research. In C. L. Cooper (Ed.), Theories of organizational stress (pp. 28-67). Oxford: Oxford University Press.

Ehrenberg, A., Juckes, S., White, K. M., & Walsh, S. P. (2008). Personality and self-esteem as predictors of young people's technology use. *Cyberpsychology & behavior*, *11*(6), 739-741.

Eschleman, K. J., Bowling, N. A., & LaHuis, D. (2015). The moderating effects of personality on the relationship between change in work stressors and change in counterproductive work behaviours. *Journal of Occupational and Organizational Psychology*, *88*(4), 656-678.

Fuglseth, A. M., & Sørebø, Ø. (2014). The effects of technostress within the context of employee use of ICT. *Computers in Human Behavior*, *40*, 161-170.

Grant, S., & Langan-Fox, J. (2006). Occupational stress, coping and strain: The combined/interactive effect of the Big Five traits. *Personality and Individual Differences*, *41*(4), 719-732.

Graziano, W. G., & Eisenberg, N. (1997). Agreeableness: A dimension of personality. In *Handbook of Personality Psychology* (pp. 795-824).

Hassan, S., Akhtar, N., & Yılmaz, A. K. (2016). Impact of the Conscientiousness as Personality Trait on both Job and Organizational Performance. *Journal of Managerial Sciences*, *10*(1), 1-14.

Hayes, A. F. (2013). Introduction to mediation, moderation, and conditional process analysis, New York. *Guilford Press.*

Hung, W. H., Chen, K., & Lin, C. P. (2015). Does the proactive personality mitigate the adverse effect of technostress on productivity in the mobile environment?. *Telematics and Informatics*, *32*(1), 143-157.

Jaiswal, T. (2014). *Indian arranged marriages: A social psychological perspective*. Routledge.

Judge, T. A., Heller, D., & Mount, M. K. (2002). Five-factor model of personality and job satisfaction: A meta-analysis. *Journal of Applied Psychology*, *87*(3), 530-541.

Khosrowpour, M., & Culpan, O. (1989). The impact of management support and education: Easing the causality between change and stress in computing environments. *Journal of Educational Technology Systems*, *18*(1), 53-67.

Lazarus, R. S., & Folkman, S. (1984). Stress, appraisal. *and coping. New York, NY: Springer Publishing Company*.

Lazarus, R. S. (2001). Relational meaning and discrete emotions. In K. Scherer, A. Schorr, & T. Johnstone (Eds.), Appraisal processes in emotion: Theory, methods, research (pp. 37–67). New York: Oxford University Press.

Le Fevre, M., Matheny, J., & Kolt, G. S. (2003). Eustress, distress, and interpretation in occupational stress. *Journal of Managerial Psychology*, *18*(7), 726-744.

Lounsbury, J. W., Foster, N., Carmody, P. C., Young Kim, J., Gibson, L. W., & Drost, A. W. (2012). Key personality traits and career satisfaction of customer service workers. *Managing Service Quality: An International Journal*, *22*(5), 517-536.

MacLeod, C. (1996). Anxiety and cognitive processes. *Cognitive interference: Theories, methods, and findings*, 47-76.

McCrae, R. R., & Costa Jr, P. T. (1991). The NEO Personality Inventory: Using the Five-Factor ModeI in Counseling. *Journal of Counseling & Development*, *69*(4), 367-372.

McCrae, R. R., & John, O. P. (1992). An introduction to the five-factor model and its applications. *Journal of Personality*, *60*(2), 175-215.

McCrae, R. R., Costa, Jr, P. T., & Martin, T. A. (2005). The NEO–PI–3: A more readable revised NEO personality inventory. *Journal of Personality Assessment*, *84*(3), 261-270.

Meier, B. P., Robinson, M. D., & Wilkowski, B. M. (2006). Turning the other cheek: Agreeableness and the regulation of aggression-related primes. *Psychological Science*, *17*(2), 136-142.

Michel, J. S., Clark, M. A., & Jaramillo, D. (2011). The role of the Five Factor Model of personality in the perceptions of negative and positive forms of work–nonwork spillover: A meta-analytic review. *Journal of Vocational Behavior*, *79*(1), 191-203.

Moreland, V. (1993). Technostress and personality type. *Online*, *17*(4), 59-62.

Nunnally, J. C., & Bernstein, I. H. (1978). Psychometric Theory McGraw-Hill New York Google Scholar.

Peeters, M. A., Rutte, C. G., van Tuijl, H. F., & Reymen, I. M. (2006). The big five personality traits and individual satisfaction with the team. *Small Group Research*, *37*(2), 187-211.

Popoola, S. O., & Olalude, F. O. (2013). Work values, achievement motivation and technostress as determinants of job burnout among library personnel in Automated Federal University Libraries In Nigeria. *Library Philosophy & Practice*, 1-31.

Ragu-Nathan, T. S., Tarafdar, M., Ragu-Nathan, B. 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.

Rashidi, Z., & Jalbani, A. A. (2009). Job stress among software professionals in Pakistan: A Factor analytic study. *Journal of Independent Study Research, 7*, 1-12.

Salanova Soria, M., Llorens Gumbau, S., & Cifre, E. (2012). The dark side of technologies: Technostress among users of information and communication technologies. *International Journal of Psychology, 1*, 1-15.

Salanova, M., Llorens, S., Cifre, E., Martínez, I. M., & Schaufeli, W. B. (2003). Perceived collective efficacy, subjective well-being and task performance among electronic work groups: An experimental study. *Small Group Research, 34*(1), 43-73.

Schmitt, D. P., Allik, J., McCrae, R. R., & Benet-Martínez, V. (2007). The geographic distribution of Big Five personality traits: Patterns and profiles of human self-description across 56 nations. *Journal of Cross-Cultural Psychology*, *38*(2), 173-212.

Schneider, T. R., Rench, T. A., Lyons, J. B., & Riffle, R. R. (2012). The influence of neuroticism, extraversion and openness on stress responses. *Stress and Health*, *28*(2), 102-110.

Selye, H. (1975). Stress and distress. *Comprehensive Therapy*, *1*(8), 9-13.

Sinha, C. (2012). Factors affecting quality of work life: Empirical evidence from Indian organizations. *Australian Journal of Business and Management Research, 1*(11), 31-40.

Spector, P. E. (1985). Measurement of human service staff satisfaction: Development of the Job Satisfaction Survey. *American Journal of Community Psychology*, *13*(6), 693-713.

Srivastava, S. C., Chandra, S., & Shirish, A. (2015). Technostress creators and job outcomes: theorising the moderating influence of personality traits. *Information Systems Journal*, *25*(4), 355-401.

Stokes, A. F. (1995, October). Sources of stress-resistant performance in aeronautical decision making: The role of knowledge representation and trait anxiety. In *Proceedings of the Human Factors and Ergonomics Society Annual Meeting* (Vol. 39, No. 13, pp. 887-890). Sage CA: Los Angeles, CA: SAGE Publications.

Suh, A., & Lee, J. (2017). Understanding teleworkers' technostress and its influence on job satisfaction. *Internet Research*, *27*(1), 140-159.

Sur, S., & Ng, E. S. (2014). Extending theory on job stress: The interaction between the "other 3" and "big 5" personality traits on job stress. *Human Resource Development Review*, *13*(1), 79-101.

Takahashi, Y., Edmonds, G. W., Jackson, J. J., & Roberts, B. W. (2013). Longitudinal correlated changes in conscientiousness, preventative health-related behaviors, and self-perceived physical health. *Journal of Personality*, *81*(4), 417-427.

Tarafdar, M., Tu, Q., & Ragu-Nathan, T. S. (2010). Impact of technostress on end-user satisfaction and performance. *Journal of Management Information Systems*, *27*(3), 303-334.

Tarafdar, M., Tu, Q., Ragu-Nathan, B. S., & Ragu-Nathan, T. S. (2007). The impact of technostress on role stress and productivity. *Journal of Management Information Systems*, *24*(1), 301-328.

Torkzadeh, G., & Doll, W. J. (1999). The development of a tool for measuring the perceived impact of information technology on work. *Omega*, *27*(3), 327-339.

Towell, E. R., & Lauer, J. (2001). Personality differences and computer related stress in business students. *American Journal of Business*, *16*(1), 69-76.

Ungku, N.U.A., Salmiah, M.A., & Wan, K.W.I. (2010). Technostress and organizational commitment: A proposed framework. *Malaysian Management Review*, *45*, 35-50.

Wang, K., Shu, Q., & Tu, Q. (2008). Technostress under different organizational environments: An empirical investigation. *Computers in Human Behavior*, *24*(6), 3002-3013.

Weil, M. M., & Rosen, L. D. (1997). *Technostress: Coping with technology@ work@ home@ play* (pp. 29-32). New York: Wiley.

Weinert, C. (2016, June). Coping with the Dark Side of IT Usage: Mitigating the Effect of Technostress. In *Proceedings of the 2016 ACM SIGMIS Conference on Computers and People Research* (pp. 9-10). ACM.

White, B. A., & Delk, L. A. (2017). Uncaring young adults show reduced vigilance for others' fearful expressions. *Personality and Individual Differences*, *106*, 77-80.

Yahaya, A., Yahaya, N., Bon, A. T., Ismail, S., & Noor, N. M. (2012). The relationship between big five personality with work motivation, competitiveness and job satisfaction. *Elixir Psychology*, *44*, 7454-7461.

Yan, Z., Guo, X., Lee, M. K., & Vogel, D. R. (2013). A conceptual model of technology features and technostress in telemedicine communication. *Information Technology & People*, *26*(3), 283-297.

Yang, C. L., & Hwang, M. (2014). Personality traits and simultaneous reciprocal influences between job performance and job satisfaction. *Chinese Management Studies*, *8*(1), 6-26.