It’s All In Your Personality: Combatting Technostress In The Workplace

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HOW PERSONALITY AND LOCUS OF CONTROL AFFECT TECHNOSTRESS

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ABSTRACT

Contemporary information and communication technologies like e-mail and instant messenger are pervasive in the workplace. Our “always-on” lifestyle has had a dramatic impact on business productivity and technology-induced stress, termed technostress. We know very little about how personality influences technostress or how perceptions of stress and objective strain differ from each other. In this study, we examine three personality characteristics: locus of control, self-efficacy, and negative and positive affect to see how they correlate with perceived stress, objective strain, and perceived performance. We found that stress and strain are not correlated and that they inversely correlate with performance. Secondly, we found that an internal locus of control positively influences objective strain. Finally, we found that negative affects are more likely to feel stress and have less confidence in their technology skills. The results provide insight into how personality differently affects stress and strain.

KEYWORDS

Technostress, Information and Communication Technology, Alpha-Amylase, Stressors, Strain, Locus of Control, Self-Efficacy, Positive and Negative Affect

INTRODUCTION

Contemporary information and communication technologies (ICTs) like e-mail and instant messenger are pervasive in the workplace. Our “always-on” lifestyle has had a dramatic impact on business productivity and technology-induced stress, termed technostress. Formally defined, technostress is the stress that directly or indirectly results from using information and communication technologies (Tu, Wang, and Shu, 2005).

Researchers have suggested that the inconsistency of empirical findings with regards to stress is due to other researcher’s failure to consider individual differences (Perrewe 1987). However, it is no surprise that individuals differ dramatically with their response to external stimuli. Some individuals are born with a personality that makes them more predisposed to stress than others. Less known is how stress occurs in an ICT context, especially while considering these individual differences. Therefore, this study examines the effects personal characteristics have on the stress process. We propose the following research questions:

How do Locus of Control, Self-efficacy, and Positive and Negative Affect correlate to objective and perceptive stress and performance?

The manuscript proceeds as follows. First, we develop a model of stress. Then, we test our hypotheses through an experiment that manipulates features of the ICT and the context to evaluate the stressor-strain relationship. Finally, we discuss our findings, implications for research, methods, and practice, and potential avenues for future research.

LITERATURE REVIEW

Rooted in Selye’s (1956) seminal work on stress, the transactional perspective suggests that stress is not a factor of the individual nor the environment, but rather an embedded ongoing process that involves the individual transacting with his or her environment, making judgments, and coping with the issues that arise (Cooper, Dewe, and O'Driscoll, 2001). The transactional stress perspective considers frequency, severity, and duration of the stressful conditions (stressors) as well as availability of stress reducing resources (e.g., social support (Smith, 2006)). In this perspective, each stressor is understood within the context of the stress process. This perspective also puts more attention on the effects of coping, where in the short-run, can immediately lessen the mind and body’s view of strain, and in the long-term, can cause people to “toughen” and adapt (Aldwin, 2007).

There are many models that draw on the transactional perspective of stress. In this study, we focus on the person-environment (P-E) fit model, which suggests that stress results from high demands or insufficient supplies to meet the person’s needs (Ayyagari, 2007; Ayyagari, Grover, and Purvis, 2011; Cooper et al., 2001; Edwards). We examine the P-E fit model within the transactional perspective of stress for two reasons. First, one cannot ignore individual differences in the
perception or appraisal of stress. Second, stress results from either a mismatch of one or both of two dimensions of the person with one or both of two dimensions of the environment: between abilities of a person and high demands or from the values of a person and insufficient supplies to meet the person’s needs (Ayyagari 2007; Cooper 1998; Edwards 1996; French et al. 1982). Basically, this model accounts for personal characteristics, coping/control characteristics, and characteristics about environmental demands.

This study specifically looks at locus of control, self-efficacy, and positive and negative affect as individual “personal” characteristics that can affect how stress is processed, felt, and received. Figure 1 depicts a model of the ICT-enabled stress and Table 1 defines its components.

<table>
<thead>
<tr>
<th>Construct</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stress</td>
<td>The overall transactional process.</td>
</tr>
<tr>
<td>Locus of Control</td>
<td>Measures the extent to which individuals believe they can control events affecting them (Rotter, 1966).</td>
</tr>
<tr>
<td>Computer Self-efficacy</td>
<td>Measures the self-confidence with internet and computer technologies. (Jex et. al., 2001; Salanova et. al., 2002; Schaubroeck and Merritt, 1997).</td>
</tr>
<tr>
<td>Positive and Negative Affect</td>
<td>A personality variable that involves the experience of negative or positive emotions and self-concept (Watson et. al., 1988; Watson and Clark 1984).</td>
</tr>
<tr>
<td>Perceived Stress</td>
<td>The psychological responses made by individuals based on an environment, such as fatigue. (Moore, 2007).</td>
</tr>
<tr>
<td>Objective Strain</td>
<td>The physiological responses made by individuals, as measured by salivary alpha-amylase (Harmon et. al., 2008; Granger et al. 2007).</td>
</tr>
</tbody>
</table>

Table 1: Construct Definitions

**Locus of Control**

We contend that control characteristics, specifically dealing with a lack of control, can lead to stress. Control has been defined in terms of personal control and locus of control, where personal control refers to an individuals’ belief in his or her lack of ability to change the environment (Perrew, 1987) and locus of control refers to peoples beliefs about the extent they can control the events that influence their lives (Rotter, 1966). Individuals who have a strong internal locus of control believe they are in charge of their own decisions and behavior. Therefore, individuals see themselves as the prime determinant of what happens in the environment (Rotter, 1966). Individuals with a strong external locus of control believe that their life is generally influenced by people outside of their control (Rahim and Psenicka, 1996). An individual with a high external locus of control believes in fate, luck, and powerful others as being in control of their outcome (Mirels, 1970). Locus of control is a cognitive phenomenon, where regardless of the level of objective personal control, predisposed perceptions and beliefs will determine the level of felt control.

In a meta-analysis on autonomy in the workplace, high levels of control have been associated with high levels of job satisfaction, commitment, involvement, performance, and motivation and low levels of emotional distress, role stress, absenteeism, turnover, and physical symptoms (Spector, 1986). Thus, the lack personal control in combination with an external locus of control can lead to strain. Therefore, the lack of control is more likely to influence stress when locus of control is external (Daniels, 1994). Therefore, we propose the following hypothesis:

Hypothesis 1: An external locus of control positively correlates with perceived stress and objective strain.
Negative and Positive Affect

Researchers examine positive affect and negative affect (PANAS) in context of feelings, where positive affect refers to the positive feelings such as alertness and excitement, while negative affect refers to negative feelings such as irritated, fear, and guilt. Consistency of the negative feelings leads to eventual illness. It has been hypothesized that positive affect may inversely correlate with stress, such that the impact of stress is reduced in positively affected personalities (Faulk, Gloria, Cance, and Steinhardt, 2012), whereas, negative affects should feel more stress (Gloria, Faulk, and Steinhardt, 2013). Little has been researched within the ICT context. Therefore, we propose the following hypothesis:

Hypothesis 2: A negative affect positively correlates with perceived stress and objective strain.

Hypothesis 3: A positive affect inversely correlates with perceived stress and objective strain.

Self-Efficacy

A specific form of self-efficacy, general computer self-efficacy, is said to be an interacting variable in stress studies (Salanova, Peiro, and Schaufeli, 2002; Zellars, Perrewe, and Hochwarter, 1999). Salanova et al (2002) found that specific levels of both general and computer self-efficacy moderated the relationship between demands and control to indicate a three way interaction leading to stress. This interaction suggested that levels of exhaustion increased when demands were high, control was low, and self-efficacy was high. Zellars (1999) found that improving efficacy may be more central to the employees perceptions of their overall work environment, mitigating the effects of high NA individuals on work exhaustion. Based on this research, we propose the following hypothesis:

Hypothesis 4: A high computer self-efficacy inversely correlates with perceived stress and objective strain.

Stress has been linked to decreases in performance (Fox, Dwyer, and Ganster, 1993); however, it is less clear how different personality characteristics and locus of control also affect perceptions of performance. Some have found that an internal locus of control is correlated with higher performers (Kutanİs, Mesca, and Övdür, 2011) and that positive affects are more likely to perceive higher performance (Yi-Chang, Chien, and Chin-Cheh, 2014). Based on this research, we propose the following hypothesis:

Hypothesis 5: Personality characteristics, locus of control, perceived stress, and objective strain will be correlated to performance.

METHOD

We tested our research model by conducting a laboratory experiment, where participants were recruited from a large eastern public university. Participants were required to meet two qualifications: experience using ICTs regularly at home or at work as well as no cardiovascular problems (e.g., known heart conditions and normal blood pressure). The latter qualification was necessary because our study manipulates participants’ stress and strain.

We used our protocol to collect data from 134 total undergraduates, established the validity of our measures, and tested our hypotheses. To improve validity, we ensured that the test had good statistical power, reliability, and implementation (Trochim, 2004).

Table 2 shows the descriptive statistics of the overall sample.

<table>
<thead>
<tr>
<th>Gender</th>
<th>Male</th>
<th>61%</th>
<th>Female</th>
<th>39%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>Mean</td>
<td>21.04</td>
<td>Standard Deviation</td>
<td>2.132</td>
</tr>
<tr>
<td>Class Status</td>
<td>Freshman</td>
<td>1.50%</td>
<td>Sophomore</td>
<td>30.40%</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>Caucasian (non-Hispanic)</td>
<td>86.70%</td>
<td>Hispanic</td>
<td>0.70%</td>
</tr>
<tr>
<td>GPA</td>
<td>&lt;2.0</td>
<td>20.0 and &lt;2.5</td>
<td>2.5 and &lt;3.0</td>
<td>3.0 and &lt;3.5</td>
</tr>
<tr>
<td></td>
<td>0.70%</td>
<td>17.80%</td>
<td>25.90%</td>
<td>34.10%</td>
</tr>
</tbody>
</table>

Table 2. Demographics

The experiment included an episode that was formed of the same two components: 1) a primary task and 2) ICT-enabled interruptions. After pretesting various tasks, we determined that the best primary task was an electronic standardized essay,
which almost every student has the fundamental knowledge to create; it demands attention and requires participants to engage in a continuous relationship with their workload. While conducting the primary task, participants received (manipulated) ICT-enabled interruption messages.

To test for objective strain, we used alpha-amylase, a hormone produced by individuals experiencing stress. Alpha-amylase represents the state of the art measures for evaluating strain and is thought to be a highly accurate measure of “real time” strain in psychological research (Rohleder, Nater, Maldonado, and Kirschbaum).

In the experiment, we utilized a design which allowed us to observe (and measure) our constructs before and after we administered the treatment (Trochim, 2004). We collected two strain data points by collecting a pre-treatment and post-treatment measure (i.e., before and after the episode) (O'Brien and Kaiser, 1985). Therefore, in our study, the percent change that occurred between the two time periods (time 1 and time 2) formed the actual measure of strain. This allowed us to get a steady baseline for each participant, which was defined as his/her chronic level of stress in an episodically relaxed environment, and compare it to his/her post treatment, which was defined as his/her episodic level of stress, as adjusted by the baseline.

To control for extraneous variation, we gathered demographic variables while holding constant the physical environment. During the experiment, we controlled for the laboratory setting, lighting, noise, temperature, seat number, and time of day the study took place. Finally, since we were gathering objective stress measures, we also controlled for alcohol usage, caffeine usage, and sugar/dairy intake in addition to whether the participant had eaten a meal 60 minutes prior to the experiment.

The means, standard deviations, Cronbach’s alpha scores, and the number of items for the entire sample of 134 participants are reported in Table 3. The locus of control scale was adopted from Rotter (1966). This 13 item measures locus of control on a continuum of internal versus external locus of control. The positive and negative affect 20-item scale (PANAS) adapted from (Watson, Clark, and Tellegen, 1988). 3 items were deleted from the scale that were too closely correlated with our stress scale (i.e., distressed; jittery; irritable). The 7-item computer self-efficacy scale adapted was adapted from Compeau (1995). Perceived Performance was measured by one item in the NASA Task Load Index, How successful were you in accomplishing what you were asked to do? (Hart and Staveland, 1988).

Properties of the constructs were assessed in terms of item loadings, discriminant validity, and internal consistency. Item loadings and inter-construct reliabilities greater than .71 are considered excellent, while greater than .63 is considered very good, .55 is good and .45 is fair (Comrey and Lee, 1992). All of our items were above the very good threshold.

<table>
<thead>
<tr>
<th>Construct</th>
<th>Cronbach's Alpha</th>
<th>Number of Items</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive Affect</td>
<td>0.875</td>
<td>10</td>
<td>2.675</td>
<td>1.163</td>
</tr>
<tr>
<td>Negative Affect</td>
<td>0.846</td>
<td>7</td>
<td>1.417</td>
<td>0.566</td>
</tr>
<tr>
<td>Perceived Stress</td>
<td>0.890</td>
<td>5</td>
<td>2.425</td>
<td>0.927</td>
</tr>
<tr>
<td>Computer Self-Efficacy*</td>
<td>0.831</td>
<td>7</td>
<td>7.886</td>
<td>6.022</td>
</tr>
<tr>
<td>Locus of Control</td>
<td>0.700</td>
<td>13</td>
<td>3.024</td>
<td>0.963</td>
</tr>
<tr>
<td>Perceived Performance</td>
<td>N/A</td>
<td>1</td>
<td>0.844</td>
<td>1.792</td>
</tr>
<tr>
<td>Objective Strain</td>
<td>N/A</td>
<td>N/A</td>
<td>4.930</td>
<td>1.292</td>
</tr>
</tbody>
</table>

*Based on a 5 point scale 1) strongly disagree to 5) strongly agree.
**Based on a 10 point scale: 1) not at all confident to 10) very confident.

**Table 3. Descriptive Statistics**

We found that perceived stress and strain are not correlated (p-value = n.s.). We found a positive correlation between perceived stress and negative affect (correlation=.382; p-value <.001) and an inverse correlation between perceived stress and computer self-efficacy (correlation = -.168; p-value <.05). We found that positive affects were inversely correlated with perceived performance (correlation = -.353; p-value <.001), while negative affects were positively correlated to perceived performance (correlation = .088; p-value <.05). Locus of control was positively correlated with objective stress (correlation = .207; p-value <.05), while having no affect on perceptual stress (p-value = n.s.). Objective strain was positively correlated with perceived performance (correlation = -.296; p-value <.001).
Table 4. Pearson Correlations

<table>
<thead>
<tr>
<th></th>
<th>PS</th>
<th>PA</th>
<th>NA</th>
<th>CSE</th>
<th>Strain</th>
<th>LOC</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived Stress (PS)</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive Affect (PA)</td>
<td>-.090 (.299)</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative Affect (NA)</td>
<td>.382 (.000)**</td>
<td>.108 (.212)</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Computer Self Efficacy (CSE)</td>
<td>-.168 (.050)**</td>
<td>.034 (.693)</td>
<td>-.205 (.017)**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Objective Strain (Strain)</td>
<td>.147 (.090)</td>
<td>-.128 (.140)</td>
<td>.002 (.980)</td>
<td>-.038 (.663)</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Locus of Control (LOC)</td>
<td>.047 (.586)</td>
<td>-.081 (.353)</td>
<td>-.067 (.439)</td>
<td>.154 (.075)</td>
<td>.207 (.016)**</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Performance (P)</td>
<td>.345 (.000)**</td>
<td>-.353 (.000)**</td>
<td>.088 (.031)</td>
<td>-.129 (.138)</td>
<td>-.296 (.001)**</td>
<td>-.04 (.645)</td>
<td>1</td>
</tr>
</tbody>
</table>

DISCUSSION AND CONCLUSION

Although previous research in IS literature has examined perceptual stress at a chronic level, researchers have yet to examine how personality affects the stress process, and how stress and strain are correlated at an episodic level. This manuscript offered new avenues to IS researchers by developing a model of how personality affects the stress/strain process in an IT setting.

An interesting finding is that perceived stress and strain are not always correlated. Perhaps our always-on culture has muted our feelings towards the stress that arises from ICTs. This may be referred to as a slow creeper, a physiological reaction that slowly builds up until one day peeking (e.g., blood pressure). Second, we found that negative affects thought they felt more stress, thought they performed better, but did not feel more strain. On the other hand, positive affects felt they performed better, probably due to the amount of care they put into their work. We also found that individuals with a more internal locus of control had more strain, but not stress. One insight might be that if you do think you are in charge, you put more pressure on yourself to compete. A similar finding was that objective strain was also more felt with people who perceived they performed better.

Contemporary ICT environments are stressful at it is critically important for different personalities to start admitting when they are stressed instead of pretending nothing is wrong. Systemic ways for organizations to manage resulting stress at the episodic level is not only relevant, but also important for businesses that seek to improve individual and organizational productivity. We hope that future researchers will continue to build on this work by exploring more individual differences as well as specific impacts on productivity.

REFERENCES


