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NEUROTICISM IN THE WORKPLACE: ITS EFFECT ON TECHNO-STRESS MEDIATED BY RUMINATION

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Abstract

With the increased dependency on technology, and during a time where most people are working from home, employees are feeling stressed, overwhelmed and their personal lives are being invaded. Our study aims to examine the relationship between individuals high on neuroticism and techno-overload and techno-invasion when mediated by affective rumination, problem solving pondering and detachment. Using a time lagged study with 91 participants, our hypotheses were partially supported. Neuroticism led us to both techno-invasion and techno-overload via affective rumination after 8 weeks. These findings underline the importance of both personality traits and rumination outside working hours.

Keywords: Techno-stress, Neuroticism, Personality trait, Rumination, Technology.

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INTRODUCTION

With the evolution of technology in the last two decades, our lives have been dependent on technological devices now, more than ever. In 2005, records show that there were only 1.1 Billion internet users compared to 4,8 billion (61.4% of the world's population) highly internet-dependent in 2020 (Statista,2020). In 2019, 293 Billion business and consumer emails were sent every day (Statista, 2020). Our day-to-day tasks have been more efficient and effective, from paying our bills, meeting new people, and grocery shopping. A click of a button can complete work tasks that needed a few hours 20 years ago today. The increasing numbers of internet accessibility have definitely facilitated our lives, but one can't assume that these advantages won't negatively affect our well-being, especially our mental health. For example, technostress increased in the past years. It is a problem of adaptation that individuals experience when they cannot cope with modern technologies(Tarafdar, Tu, Ragu-Nathan,& Ragu-Nathan, 2007). It is an emergent phenomenon closely related to the pervasive use of information and communication technologies in modern society. (La Torre, G., Esposito, A., Sciarra, I. *et al., 2019).* Organizations currently rely on information and communication technologies (ICTs) to run their businesses by implementing new strategies, cutting costs, storing and analyzing data, etc...With the increased access to technology, workers must handle more tasks. It is estimated

that the US worker received, on average, 126 work-related emails per day in 2019 (Radicati, 2019) while using his work-email for 3 hours/day. Employees' privacy is no longer as respected as before. Managers expect you to be reachable at all times, whether you are on vacation or having dinner with your family. Latest studies have shown that 76 % of employees check their email outside working hours, with 33% at least once every hour (Statista, 2019). Covid-19 did not help at all. According to Stanford University economist Nicholas Bloom, about 43% of the US workforce is currently working full time from home (Wong, 2020). Although researchers noticed an increase in productivity while working from home during the pandemic, employees are apparently more stressed (Maurer, 2020). Some individuals, more than others. According to a CNBC survey, 69 % of employees experience burnout symptoms due to the increasing level of stress. Many studies have been done on techno-stress, showing us its risks and its effects on our daily lives. It can negatively affect our job performance, productivity, and satisfaction (Tarafdar, et.al, 2007). Everyone is vulnerable to technostress to a certain extent; individual personality has a major role on workplace behaviour (Lee, Ashton & Shin, 2005). We sometimes notice that 2 individuals working in the same company who have similar roles with the same exposure to ICTs are not affected in the same way. Which leads us to wonder, Why are certain individuals more prone to technostress than others? Although research has made a lot of progress in the past years, the answers are still unclear. Personality traits reflect people's characteristic patterns of thoughts, feelings, and behaviors, which can be described along several dimensions (Diener, 2019). Previous research showed the importance of personality traits on an individual's mental health, specifically to overcome stressful situations (Code & Fox, 2001). Individuals with different personalities face and cope with organizational stress differently. (Wiebe & Smith, 1997).

According to Thomas Widiger, “neuroticism is the trait disposition to experience negative effects, including anger, anxiety, self-consciousness, irritability, emotional instability, and depression” (Widiger & Oltmanns 2017). We argue that individuals high on neuroticism tend to think more about work-related issues outside of working hours and are more likely to be vulnerable to technostress. Researchers have found that neuroticism is a marker of vulnerability during the covid-19 pandemic(Khosravi 2020). Individuals high on neuroticism are more anxious; they concern themselves with the COVID19-related information and pandemic consequences and experience more adverse impacts while ruminating (Khosravi,2020). With the increase of remote working during the pandemic, we believe that techno-invasion and techno-overload are increasing dramatically compared to the other stressors. It is also estimated that employees work 48.5 minutes more a day than before the lockdowns (DeFilippis et al. 2020). Our study will explore the direct and indirect relationship between Neuroticism and technostress (overload and invasion) when mediated by different types of rumination. To do so, we created a panel study in 2 different moments in time with the help of participants from Europe, the middle east, and north America from different age groups and industries.

Our results will contribute to the literature on techno-stress in at least 3 different ways: First, previous researches have focused mostly on the consequences of techno-stress in the workplace. We will contribute to Tarafdar's research on the “consequences of techno-stress for end-users in organizations” (Tarafdar et al.,2008) by studying the individual's mental state outside working hours that leads to this phenomena. Second, unlike previous research that discussed the importance of personality traits in techno-stress research (Srivastava, Chandra & Shirich, 2015),

our study will provide a deeper understanding by focusing on one personality trait such as individuals high on neuroticism. Neuroticism seems to be particularly important, as it makes people more vulnerable to stress, especially during the covid pandemic (Khosravi, 2020). Third, our study took place in a critical time, as the pandemic changed our work habits and increased our dependency on technology. It is essential to know the effects that covid-19 had on our mental health in regards to working from home and the ability to avoid and cope with techno-stress, especially as recent research has shown that Neuroticism is highly associated with fear of Covid-19 as well as boredom during the pandemic (Caci, Miceli, Scrima et Cardaci, 2020). Figure 1 illustrates our theoretical model.

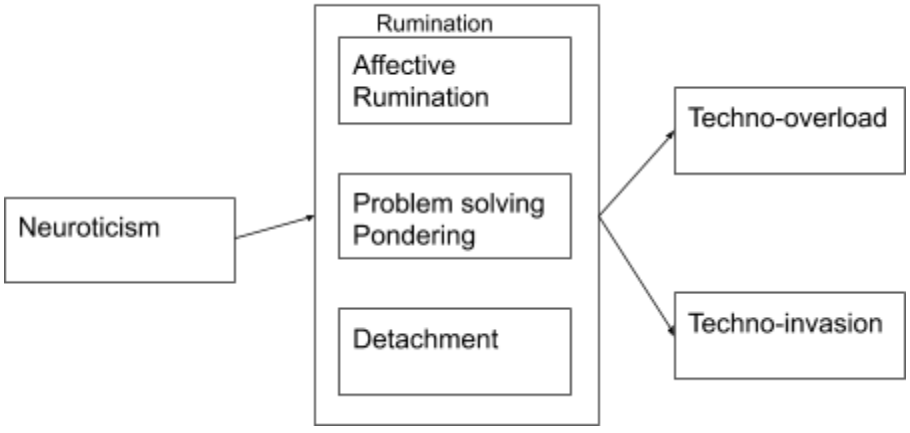


Figure 1: ***Theoretical model***

Literature review

Introduction of Techno-stress.

Technology is considered one of the key stressors in today's world, and that phenomenon was named Techno-stress (Tarafdar et al. 2007). American psychologist Craig Brod first mentioned it in his book Titled "Techno-stress" in 1984. It is the human cost of the computer revolution (Brod, 1984). Your body's physical, mental, and emotional responses result from the inability to cope with the increased dependency on computer technologies in a healthy manner(Brod, 1984). During the first years of exploring technostress, researchers have identified several causes that were later categorized. First, ICT knowledge and sufficiency became a job requirement for most employers as they are becoming more dependable on technological tools for the daily job tasks (zuboff, 1988) This is leading to a constant introduction of updated software and hardware versions to ensure reliability and good performance(Zuboff 1988). Second, because of the ever-increasing sophistication of ICTs, employees and managers do not have the proper knowledge to successfully perform(Zorn,2002). Third, modern ICTs have changed the way we conduct business. Although communication is definitely easier and more reliable, they also increase remote supervision, and the necessity to multitask. (Weil and Rosen 1997, Brillhart 2004). Techno-stress is also defined as any negative impact on attitudes, thoughts, behaviors caused directly or indirectly by technology (Weil & Rosen, 1997). It has serious negative impacts on our daily lives, especially in the workplace. It has direct and indirect effects on our performance, organizational commitment, job satisfaction, mental and physical well-being, not

only during working hours but also on our personal lives (Tarafdar et al. 2008). Several techno-stress symptoms were identified that included physical symptoms such as stress-related skin Disorders (psoriasis dermatitis)(Alexopoulos & Choros, 2016) increased heart rate(De Kloet et al.2005), gastrointestinal disorders (irritable bowel syndrome, gastritis, reflux) (Chiapetta, 2017), as well as mental effect such as, depression, behavioral changes, decreased sexual desires, and apathy. (Danon, et al., 2012; Chiappetta, 2017). Since the mentioned causes are still the main reasons for techno-stress, more specific terms were derived for the purpose of standardization and universal use. Techno-stressors, also known as techno-stress creators, are stressful situations caused by technological devices that result in strain and, most-likely, leading to techno-stress. They included: Techno-overload, techno-complexity, techno-insecurity, techno-uncertainty, techno-invasion, and techno-unreliability (Ragu-Nathan et al.2008).

Table 1

Techno-creators	Definition
Techno-overload	describes situations where ICT forces users to work faster and longer.
Techno-invasion	describes the invasive effect of ICT in terms of creating situations where users can potentially be reached any time, employees feel the need to be constantly "connected," and there is a blurring between work-related and personal contexts.
Techno-complexity	describes instances where the complexity associated with ICT makes users feel inadequate as far as their skills are concerned and forces them to spend time and effort in learning and understanding various aspects of ICT.
Techno-insecurity	is associated with situations in which users feel threatened about losing their jobs either to automation resulting from new ICT or to other people who have a better understanding of the ICT.
Techno-uncertainty	refers to contexts where continuing changes and upgrades in ICT unsettle users and create uncertainty for them in that they worry about constantly learning and educating themselves about new ICT.

Tarafdar et al., 2011

Technology-mediated interruptions (caused by techno-overload) are also widespread while working with ICTs. (i.e., Focusing on a task and then being interrupted by an email that requires immediate attention.) These interruptions proved to be reducing employee satisfaction (Asli & Basogly, 2009). As stated before, research has shown that individuals working from home during the pandemic are working longer hours(DeFilippis et al. 2020). Working from home also means having easy access to your work equipment almost the whole day (Emails, internal systems,..).

Employees' privacy is being invaded and the working hours are no longer respected. In fact, a recent study has shown the positive relationship between working from home and techno-invasion (Molino, Ingusci & Signore, 2020). With that being said, we will be focusing on both techno-invasion and techno-overload as they are the most important factors due to the increasing number of employees working from home during this pandemic. According to (Tu et al. (2005), techno-overload showed a significant positive relationship with organizational commitment and productivity. Research has demonstrated that these techno-creators lead to several strains that increase Techno-stress. They decrease end-user satisfaction (Tarafdar et al. 2010 Tu et al. 2008; Ioannou et al.2017), job satisfaction (Ragu-Nathan et al.2008; Tarafdar et al.2011), performance (Tarafdar et al.2010; Ioannou et al.2017) and commitment (Tarafdar et al. 2011).

The relationship between neuroticism and technostress.

One of the main models of personality is the big 5 personality traits that include openness to experience, neuroticism, agreeableness, conscientiousness, and extraversion.

The big five Personality traits

Traits	Definition
Agreeableness	is the tendency to be kind, affectionate, cooperative, and altruistic. People high on this personality dimension tend to be more compassionate
Conscientiousness	is the tendency to show good impulse control and act dutifully. Highly conscientious people are achievement-oriented, well organized, and tend to be mindful of details
Extraversion	is characterized by assertiveness, sociability, and excitability. People who score high in extraversion are described as outgoing and gain energy in the company of others.
Openness to experience	describes very creative individuals who are open to trying new things. People high in openness prefer variety and have a broad range of interest
Neuroticism	is a trait marked by unpleasant emotions like sadness, anger, anxiety, and emotional instability. Those who are high in the trait are prone to mood swings and experience high levels of stress

In this study, we will be using a nomothetic approach by focusing only on neuroticism. Individuals high on neuroticism face greater risks as they tend to overthink things and face emotional vulnerability, especially during the pandemic. As previously stated, individuals high on neuroticism tend to be more feared about the impact of COVID-19 on their daily lives, which makes them ruminate more(Caci et al., 2020). First, research has shown that neuroticism is associated with the difficulty of effectively coping with stress or regulating negative emotional states (Gross,1998). Second, a high level of neuroticism has been directly linked with several psychological and physiological stressful issues, such as a negative relationship with panic disorder (Mineka, Watson, & Clark, 1998), anxiety disorder (Gershuny & Sher, 1998), eating disorder (Cervera, et al., 2003), personality disorder (Bock, Bukh, Vinberg, & Gether, 2010), mood disorder (Kendler, Kuhn, and Prescott, 2004) schizophrenia (Van os & Sher, 2010) and

phobia (Bienvenu & Ginsburg, 2007). These factors also show that these individuals do not have the proper coping skills that could protect them against the negative health impact of chronic stress(Gunthert et al., 1999).

Given the relationship between neuroticism and techno-stress, we believe that the increasing amount of workload and the extended need to perform work related tasks during your personal time makes individuals high on neuroticism more vulnerable to techno-stress.

H1: Individuals with higher levels of neuroticism are more likely to experience higher a)Techno-overload b) techno-invasion in the workplace.

The Mediating Role of Rumination

To avoid techno-stress, our minds also need breaks, just like our bodies. We need to be able to recover from stressful situations and thoughts that occur during our working hours. Recovery is defined as the psychological and physiological unwinding after effort expenditure at work (Geurts & Sonnentag 2006). The recovery process is influenced by the ability to disengage(or disconnect) from their work related thoughts (Cropley, Dijk, &Stanley, 2006). Rumination is defined as "a class of conscious thoughts that revolve around a common instrumental theme, and that recur in the absence of immediate environmental demands requiring the thoughts" (Martin, & Tesser, 1996, p7). It can negatively affect your mental health and job performance, but in some cases, if controlled properly, it can give the individual a beneficial impact that will be described

later on. Our study will use the typology suggested by Cropley et al that included 3 subscales: Affective rumination, problem-solving pondering, and detachment. Affective rumination can be explained as a recurrent representation of a stressor in the individual's mind so that a stressful event can continue in one's thoughts (Zawadzki, Graham, & Gerin, 2013; U. Hamesch, M. Cropley and J. Lang, 2014). It also means that the individual tries to ignore and not think about previous work-related problems. Previous research has proven that thought suppression often resulted in the subsequent increased return of unwanted thoughts. (Wegner et al., 1987), which will lead to several stress-related disorders such as anxiety, depression, etc..(Wegner & Zanakos, 1994).Furthermore, effective rumination is strongly related to increased work-related fatigue (Querstret et al., 2012) and poor sleep quality (Cropley, Dijk, & Stanley, 2006). Most research related to remuneration previously examined the negative aspects of repetitive work-related thoughts; however, researchers also focused on adaptive repetitive thinking. In fact, several studies have suggested that thinking about work-related unsolved issues can help increase creativity and innovation (Spoor, De Jonge, & Hamers, 2010; Cropley & Zijlstra, 2011). Problem-solving pondering is defined as unemotional and prolonged thinking about solutions to particular work-related problems (Cropley & Zijlstra, 2011). It can lead to either constructive consequences, such as anticipatory planning and recovery, which means finding solutions to certain problems, or unconstructive consequences such as anxiety and depression (Watkins, 2008). Detachment is the ability to disconnect from work-related thoughts outside work (Job-related activities, work related tasks, job related issues etc..). Research also suggests that psychological detachment is also related to leisure activities such as sports, family time, gaming, etc..(Sonnentag, 2012) That's why people try to find hobbies to do regularly. People that proved

to have the ability to detach from work are the ones that maintained a healthy work-life balance. Psychological detachment shows positive relationships with other recovery experiences such as relaxation, mastery, and control (Sonnentag & Fritz, 2007). The lack of detachment ability was proven to increase job exhaustion (Sonnentag et al. 2010), leading to techno-stress. Despite being different concepts, these 3 types of ruminations are correlated with one another. Poor detachment relates to worry and affective rumination(Sonnentag and Fritz, 2015). Affective rumination also correlates to problem-solving pondering (Hamesch et al., 2014). We also know that job stressors persist in an individual's mind although not physically present (Brosschot et al., 2006), leading to negative physical and psychological health outcomes over time (Schwartz et al., 2003; Kinnunen et al., 2017). Personality factors, including neuroticism, also influence cognitive processes in response to stress; for example, neurotic individuals may be predisposed to repetitive and ruminative thoughts when confronted with stressors owing to their more anxious nature (Geurts et Sonnentag, 2006). We argue that individuals high on neuroticism tend to think about work-related issues, try to find solutions to work-related problems, and doesn't have the ability to disconnect from their jobs outside of working hours, are more vulnerable to techno-stress as they feel they have a higher workload and their personal life is being invaded.

H2: Affective rumination mediates the positive relationship between neuroticism and a) techno-overload b) techno-invasion in the workplace.

H3: Problem-solving pondering mediates the positive relationship between neuroticism and a) techno-overload b) techno-invasion in the workplace.

H4: Detachment mediates the negative relationship between neuroticism and a) techno-overload b) techno-invasion in the workplace.

Method

Sample and procedure

We used the snowballing sampling method. Participants were a combination of friends, family, colleagues, and their connections. They answered the survey using a link directed to Qualtrics software. We did not request any names or the companies they work with to ensure their responses' confidentiality. We sent out the first survey in July 2020 (Time 1). We requested their emails to send them the second survey and be able to merge both data sets. 204 individuals responded to the first survey with an age mean of 31.6 (S.D=11.37). 85 were females (41.7%), and the other 119 were males (58.3%). Time 1 also included 30 different nationalities. 8 weeks later, we sent out the second survey, only to the people that participated in Time 1.

The final sample included 91 participants from 19 different countries with a mean age of 31.55(S.D = 10.73). 45 identified themselves as males (49.5%), and 46 identified themselves as females (50.5%). Participants were asked to indicate how long they have been working for their current employer. 28.6% were employed less than 1 year ago(26 people), 31.9% from 1-3 years (29

people) , 13.2% from 3-5 years(12 people), 14.3% from 5-10 years(13 people) and 12% have been working for over 10 years in the same company(11 people).

Neuroticism(time 1) included 8 statements previously used by John Oliver (1990) to assess the level of neuroticism. (e.g., 'I see myself as someone who is depressed, blue'; 'I see myself as someone who can be moody'). We used the 5-point Likert scale as our options. The results were reliable. Cronbachs' Alpha was .77

Rumination was studied using 3 subdimensions. We used 15 items in total developed by Cropley et al. (2012). One of them was reverse coded. Items were measured on a 5 point Likert scale.

First, we measured affective rumination: (e.g. 'Are you annoyed by thinking about work-related issues when not at work?') Cronbach's' Alpha was .87. Second, we measured problem-solving rumination: (e.g., 'In my free time I find myself re-evaluating something I have done at work'). Cronbachs' Alpha was .78. Last, we measure detachment (e.g., 'Do you find it easy to unwind after work?') Cronbachs' Alpha was .74

Techno-stress was studied by measuring two of its stressors, Techno-Invasion and Techno-Overload, with 4 and 5 items, respectively. They were previously used by Ragu-Nathan & Tarafdar(2008). (e.g.' I have to sacrifice my vacation and weekend time to keep current with mobile technologies' "Techno-Invasion"; .' I am forced by mobile technologies to work with very tight time schedules' "Techno-Overload"). The options given were based on a 5 point Likert scale. The responses were reliable. Cronbach's' Alpha scores were .70 and .80, respectively.

TABLE 1
Descriptive Statistics, Correlation, and Reliabilities (Cronbach's Alphas)a,b

	Mean	S. D	1	2	3	4	5	6	7	8
Age										
Gender			0.15							
Time in Current Employment	1.51	0.50	0.82**	0.17						
Neuroticism	2.37	1.43	-0.14	0.37**	-0.06					
Affective Rumination	2.72	0.53	-0.05	0.18	-0.03	.249*				
Problem Solving Rumination	3.53	0.83	0.02	-0.07	-0.21*	-0.01	0.19			
Detachment	3.69	0.64	-0.06	0.07	0.10	-0.04	-0.45**	-0.39**		
Techno-Invasion	0.96	0.24	0.20	0.232*	-0.03	0.21*	0.50**	0.09	-0.30**	
Techno-Overload	3.51	0.71	0.03	0.06	0.15	0.21*	0.35**	0.08	-0.24*	0.59**

a5 point scales.
bCronbach's alpha is reported on the diagonal.
*p < .05; **p < .01.

Table 2:
Regression analysis

	Techno-overload					Techno-invasion				
Predictors	B	SE	t	LLCI	ULCI	B	SE	t	LLCI	ULCI
Neuroticism	0.27	0.15	1.82	-0.2	0.57	0.18	0.13	1.37	-0.84	0.45

Control variables: Participants were also asked to identify their age and gender, and tenure. They provided us with the information on how long have they been working in the same organization by choosing one of the following: less than one year, from 1 to 3 years, from 3 to 5 years, from 5 to 10 years, and over 10 years.

Statistical analysis

We used 2 different types of analysis in our study. We began by examining Hypothesis H1a and H1b by using linear regression analysis on the SPSS software to examine the direct relationship between neuroticism and techno-invasion and techno-overload. We then used an SPSS macro (Process) created by Andrew Hayes to test mediating hypotheses. PROCESS is an observed variable OLS and logistic regression path analysis modeling tool. It is used for estimating direct and indirect effects in single and multiple mediator models (Hayes, 2012). Since we wanted to study the mediated effect of the 3 types of rumination on the relationship between neuroticism and techno-overload and techno-invasion, we used model 4. Process allows us to calculate confidence intervals with a bootstrap approach. It is a simple but compelling approach that creates multiple *resamples* (with replacement) from a single observation set. It also ensures a Non-Parametric statistical analysis and an easy construction in calculating confidence intervals from the resampling distribution (Ho, 2019). We used 5000 bootstrap samples with a 95% bias-corrected bootstrap confidence interval. Control variables such as age, gender, and tenure were also part of the analysis.

Table 3:
Bootstrapping analysis Rumination facets (Mediators)

	Affective rumination					Problem solving pondering					Detachment				
Predictors	B	SE	t	LLCI	ULCI	B	SE	t	LLCI	ULCI	B	SE	t	LLCI	ULCI
					0.74										
Neuroticism	0.41	0.17	2.44	0.08		0.08	0.12	0.67	-0.16	0.31	-0.47	-0.05	-1.01	-0.14	0.05

RESULTS

Table 1 presents correlation, descriptive statistics, and reliabilities (Cronbach's alphas). We tested our hypothesis using our final sample containing 91 participants. Hypothesis 1 suggests that neuroticism is positively associated with techno-overload and techno-invasion (H1a and H1b, respectively). To test these hypotheses, we used a regression-based analysis. Both techno-overload and techno-invasion showed insignificant results as our bootstrap confidence intervals included a zero. ([LLCI = -0.2 ; ULCI 0.57] [LLCI =-0.84; ULCI= 0.45]) respectively. Therefore H1a and H1b are not confirmed. For H2, H3, and H4, We used a bootstrapping analysis (Table 3 and 4). Our second hypothesis suggested that affective rumination mediates the positive relationship between neuroticism and a) techno-overload and b)techno-invasion in the workplace. We tested them by measuring the relationship between neuroticism and affective rumination (B=0.4; CI [-0.2; 0.57] as well as the relationship between affective rumination and techno-overload (B=0.27; CI [0.06; 0.57]) and techno-invasion (B=0.37; CI [0.17; 0.56]) respectively. And finally the indirect relationship of affective rumination on neuroticism and techno-overload and techno-invasion (B= 0.11; CI [0.01; 0.28]) (B= 0.11; CI [0.02; 0.27]). As expected, both H2a and H2b were confirmed. Our 3rd hypothesis t suggested that problem-solving pondering mediates the positive relationship between neuroticism and techno-stress in the workplace due to a)techno-overload. We measured the relationship between neuroticism and problem solving (B=-0.02; CI [-0.30; 0.25], then the relationship between problem solving pondering and techno-overload (B= -0.00; CI [-0.04; 0.04]) and b) techno-invasion (B=-0.11; CI [-0.36; 0.14] And finally the indirect relationship of problem

solving pondering on neuroticism and techno-overload (B= -0.00; CI [-0.04; 0.02]) and techno-invasion((B= -0.00; CI [-0.06; 0.03]). H3 were not confirmed.

Our 4th hypothesis implies that detachment mediates the positive relationship between neuroticism and techno-stress in the workplace due to a)techno-overload and b)techno-invasion.We measure the relationship between neuroticism and detachment (B=-0.20; CI [-0.98; 0.58], then the relationship between detachment and techno-overload (B= 0.01; CI[-0.04; 0.08]) as well as techno-invasion (B=-0.27; CI [-0.98; 0.43], lastly, the indirect relationship of detachment on neuroticism and techno-overload (B= 0.01; CI [-0.03; 0.05]) and techno-invasion (B=0.01; CI [-0.03; 0.07]). H4 was also rejected. Therefore our results only supported H2a and H2b.

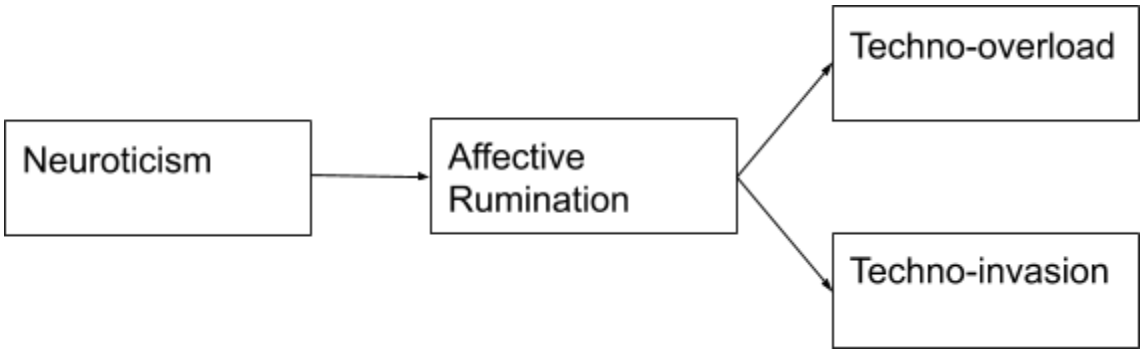


Figure 2: Final model

Table 4

Bootstrapping Analysis—Techno-invasion and Techno-overload (Outcomes)

	Techno-invasion					Techno-overload				
Predictors	B	SE	t	LLCI	ULCI	B	SE	t	LLCI	ULCI
Neuroticism	0.18	0.13	1.36	-0.08	0.45	0.27	0.15	1.82	-0.02	0.57
Affective rumination	0.37	0.10	3.80**	0.17	0.56	0.27	0.11	2.54*	0.06	0.49
Problem solving pondering	-0.11	0.13	-0.86	-0.36	0.14	-0.02	0.14	-0.16	-0.30	0.25
Detachment	-0.27	0.36	-0.76	-0.98	0.43	-0.20	0.39	-0.50	-0.98	0.58

Notes: LLCI = Lower-level confidence interval; ULCI = Upper-level confidence interval.
*$p < .05$; **$p < .01$.

DISCUSSION

Motivated by the increased dependency on mobile technology, this research aimed to explain why individuals high on neuroticism are more vulnerable to techno-invasion and techno-overload. We unfold 2 research gaps: how personality influences techno-stress(Tarafdar, 2007)- and how rumination affects our vulnerability to techno-stress(Tarafdar et al., 2017). Since the study was done during the lockdown and acknowledging the previous research on the relationship between Neuroticism and the current pandemic, we decided to only use neuroticism as our main personality trait in this study. The pandemic changed our lifestyles. Our home was a place of comfort, relaxation, and a getaway from a long hard day at the office. Now it's our 24/7 office. With the laptop and the work phone always by our side, It is no longer an 8-hour job. Our lives are being invaded, and our workload is increasing. Individuals high on neuroticism were vulnerable to techno-invasion and techno-overload, even before the pandemic (Riedl, 2012). However, they were able to detach, separate, and ignore unwanted work-related thoughts by going out with their families, focusing on their hobbies… With the current lockdown, our thoughts are controlling us. They are actively thinking about work-related incidents, issues, information, etc.. and since individuals high on neuroticism tend to be more anxious and worried, they are more likely to ruminate, leading to techno-stress.

Our results contribute to the literature of Techno-stress in at least 3 different ways: First, we contribute to the discussion of neuroticism in the workplace and its effect on technostress. In line

with previous research on the relationship between personality traits and techno-stress(Srivastava et al., 2015), we were able to predict and show that neuroticism is associated with techno-invasion and techno-overload when it is affected by rumination, 6 to 8 weeks later. Second, to add to the previous research that mostly focused on the consequences of techno-stress, we illustrated some reasons behind it. We were able to identify how the level of rumination can increase or decrease our vulnerability to techno-stress when we are faced with techno-overload and techno-invasion. Third, as the pandemic continues to control our lives, companies are faced with tough decisions on whether to return to the offices or continue to work from home (Senz, 2020). With all the advantages that remote working has on organizations, our study demonstrated some serious negative effects on an individual's mental state.

Practical Implications

In today's complex, fast-paced, and competitive business world, a stress-free environment is nearly impossible. However, due to its importance, managers are aiming to minimize it. A key implication is that managers should consider that employees have different personality characteristics, and increasing the workload might affect them in different ways. While employees are working from home, managers should also respect their privacy; having your work laptop in the next room does not mean you should be available to answer your emails. Research has shown that employees' excessive technology use can have negative organizational outcomes (Brooks & Califf, 2017). Research has also shown that technostress manifests its

effects in the form of increased role overload, role conflict, exhaustion, and burnout, and decreased job satisfaction (e.g., Tarafdar et al. 2015. Tarafdar et al., 2007; Ragu-Nathan et al., 2008). Furthermore, studies have also suggested that adding technology responsibilities could be associated with technostress and decrease performance. Organizations should provide for employees workshops and seminars on mindfulness. It enhances stress management, promotes employee self-care, and highlights the importance of an effective work/life balance, the separation of your work life for your job, and the mental detachment from job-related concerns. Companies should organize non-work-related activities once in a while during working hours. Although there is no standardized stress-management strategy, several ways deemed successful, that includes: peer support, exercise, and laughter(Harrington and Evans. 2003)

Limitation And Future Research

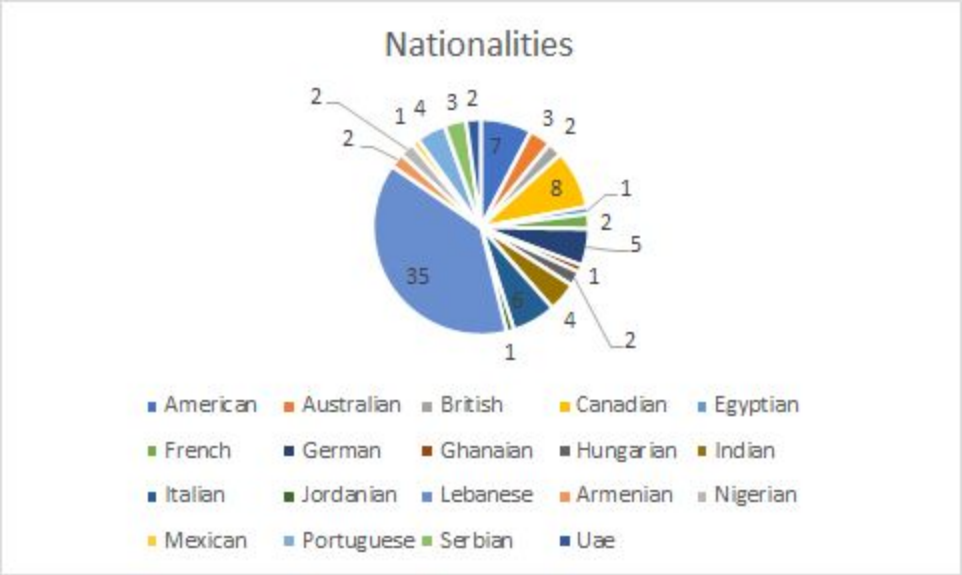
Our study presents several limitations that should be acknowledged. First, our final sample was made of 91 participants. A larger sample should be used to ensure statistical power and test our hypothesis in future studies. Second, our studies included individuals from 19 different countries with different levels of access to the internet. This might have affected our results on technology dependency in the workplace. Future studies should focus on different cultures with different access levels to the internet while comparing international organizations operating in first world countries to second and third world countries. Third, on August 4th, 2020, between our first and second survey, a massive explosion hit the city of Beirut, Lebanon, leaving the citizens with

traumatic memories. Our study included Lebanese participants. Some of them were working in Beirut during the catastrophe. This event might have affected our stress results. At a later stage, we should consider other events that might affect our results (Family issues, health issues, economic situation, etc..) Lastly, we focused only on neuroticism due to its important effects during the corona-virus pandemic. However, this does not mean that other personality traits do not play an important role. Future studies should also include analyzing other personality characteristics and monitoring the different reactions on both vulnerability and the ability to cope with techno-stress by including different types of techno-creators.

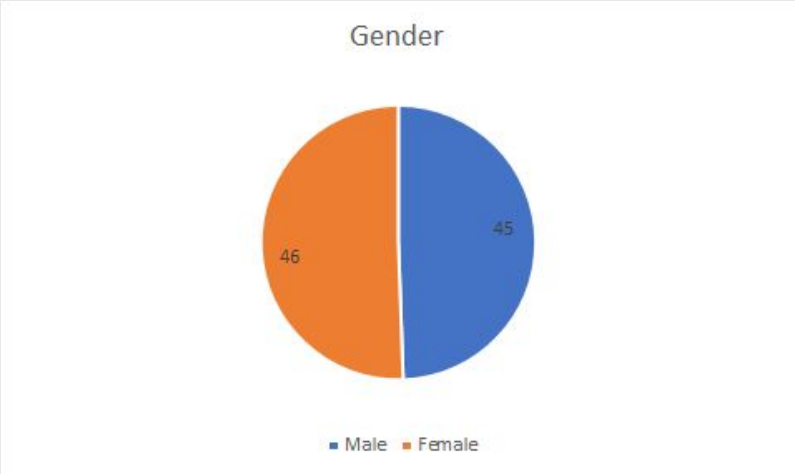
CONCLUSION

To sum, our study highlights the importance of considering neuroticism and affective rumination as an organizational issue. Employees with a high level of neuroticism tend to ruminate outside of working hours, which makes them more vulnerable to techno-invasion and techno-overload. We advise researchers to continue the study of personality and rumination, especially in a time where businesses are struggling the most given the conditions imposed by the pandemic.

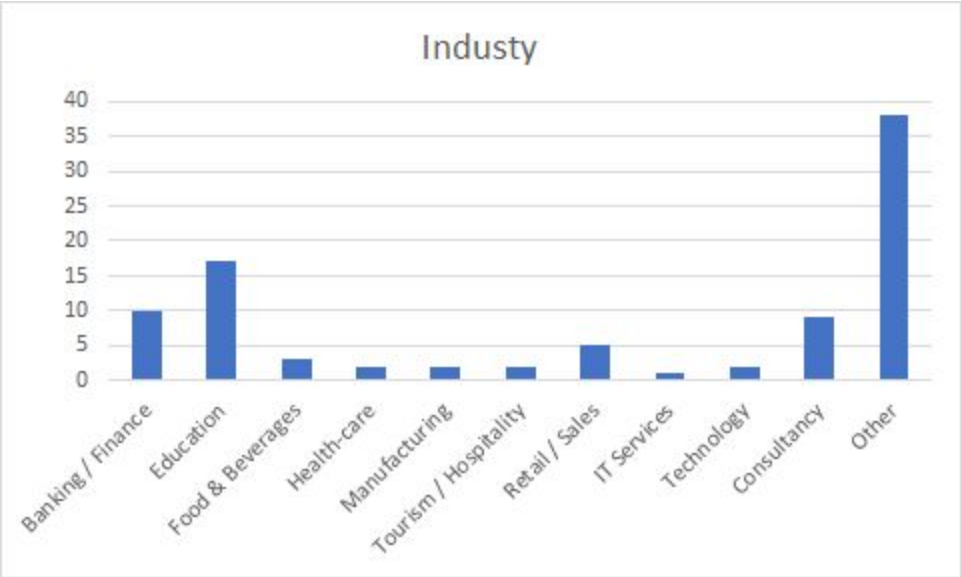
Appendix



Appendix 1



Appendix 2


Industy
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Banking / Finance
Education
Food & Beverages
Health-care
Manufacturing
Tourism / Hospitality
Retail / Sales
IT Services
Technology
Consultancy
Other

Appendix 3

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