



TECHNIUM
SOCIAL SCIENCES JOURNAL

Vol. 27, 2022

**A new decade
for social changes**

www.techniumscience.com

ISSN 2668-7798



9 772668 779000

Technostress and counterproductive behaviours in an organisation

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Abstract. Work can be a place where we experience stress. In recent years, employees exposed to work with the use of information and communication technologies have reported symptoms of technostress. In turn, such frustration may lead to various negative and ineffective behaviours at work. The aim of the study was to analyse the links between technostress and counterproductive behaviours (theft, fraud, withdrawal and sabotage). 676 employees (including 50.9% women) aged 20 to 63 ($M = 41.04$; $SD = 13.46$) using ICT on a daily basis were surveyed. The study used the Counterproductive Behaviours Questionnaire and the Technostress Creators and Technostress Inhibitors Scale. The obtained results confirmed a positive relationship between Technostress creators and counterproductive behaviours and a negative relationship between Technostress inhibitors and counterproductive behaviours. These results can be used in organisations to minimize the risk of counterproductive behaviours by counteracting the occurrence of Technostress creators and reinforcing Technostress inhibitors.

Keywords. Technostress, technostress creators, Technostress inhibitors, Counterproductive behaviours

1. Introduction

Professional work is a very important aspect of human life. Although people get a lot of satisfaction from their work (Fassoulis & Alexopoulos, 2015; Cross, 2019), they also experience work-related stress. Occupational stress is considered a serious problem in contemporary organisations and more and more people report that they experience stress at work (Stranks, 2005; Ulrich et al., 2007; Beattie & Griffin, 2014). European public opinion polls reveal that as many as 73% of European employees report experiencing work-related stress at least once a month, and 16% struggle with stress every day and therefore consider changing jobs. In Poland, 22% of employees claim that they experience stress every day (Milczarek et al., 2016). The most common causes of work-related stress include: type of tasks performed by employees (e.g. monotony or complexity), work intensity, excessive demands, overload of duties or changing working conditions (EU-OSHA & Eurofound, 2014).

1.1 Technostress

It was already observed in 1984 that the use of new computer technologies may be the source of stress (Brod, 1984). Technostress is stress experienced by employees as a result of

multitasking, constant contact, information overload, frequent system updates and the resulting uncertainty, the need for continuous learning and the resulting job-related uncertainty and technical problems related to the organisational use of information and communication technologies (ICT) (Tarafdar et al., 2011). Due to the continuous technological and civilizational development, dealing with ICT-related stressors is becoming an inevitable part of functioning of employees in almost every organisation (Jena, 2015). Ragu-Nathan et al. (2008) have identified five groups of factors that constitute the source of technostress. These include: (a) Techno-overload - a situation where introduction of ICT requires longer, faster and more intensive work than before its introduction; (b) Techno-invasion refers to a situation where thanks to technology (laptops, smartphones, high-speed data transmission) employees can be available to the employer at any time, even outside of working hours and place of work; (c) Techno-complexity is a situation where the technology used in an organisation becomes more and more complicated year by year, and its users feel that their skills are insufficient due to the progressive complexity of the implemented technological solutions; (d) Techno-insecurity is a situation where employees, due to the progressive ICT development in the organisation, are afraid of losing their jobs to the advantage of other employees who have more knowledge, skills and competence to use modern technologies effectively; (e) Techno-uncertainty refers to a situation where ICT users feel insecure, because constant changes and improvements in information and communication technologies make their knowledge and skills obsolete very quickly. This makes them constantly learn and update their knowledge to keep up with the technological innovations used in the organisation.

Apart from technostress creators, Tarafdar et al. (2011) have also identified technostress inhibitors that protect employees from experiencing technological stress. They include: (A) Literacy facilitation, which includes equipping employees with the necessary knowledge, skills and competence necessary to deal effectively with ICT in the position occupied; (b) Technical support provision refers to the situation where the organisation provides fast and effective assistance of the technical support department in case of ICT-related problems; (c) Involvement facilitation takes place by building employee engagement by encouraging and engaging them at various stages of the implementation of a new ICT. This is done by informing employees about planned changes, their scope and how these changes will affect both the effectiveness of the entire organisation and their work.

Functioning in technostress conditions may have numerous negative consequences both for the employees themselves and for the organisation. Stressful working conditions lead to mental problems (e.g. burnout and anxiety neurosis), health problems (e.g. fatigue, headaches, neck pain, migraines and hypertension) or negative emotional and cognitive reactions (e.g. irritation, dissatisfaction with work) (Spector, 2002; Tarafdar et al., 2007; Fuglseth & Sørebo, 2014; Jena, 2015). Functioning of employees under stress may also have negative consequences for the organisation, such as an increased number of accidents, low job satisfaction, poor organisational commitment, increased absenteeism, limited productivity, job dissatisfaction and, consequently, high employee turnover (Suh & Lee, 2017; Jena, 2015; Kot, approved for printing; Stranks, 2005; Spector & Fox, 2005; Tarafdar et al., 2011; Fida et al., 2016). One of the potential effects of functioning under stress may be counterproductive behaviours, which include a number of various phenomena having a destructive effect on the organisation and the personnel (Spector et al., 2006).

1.2 Counterproductive behaviours

Due to the increasingly frequent pathological behaviours at work, such as theft, sabotage, physical aggression towards colleagues or unjustified absenteeism, many theories have been developed that help explain the problem of counterproductive work behaviour (CWB). Counterproductive work behaviour is a complex phenomenon. There is no consensus among researchers regarding the definition of counterproductivity and its meaning. Counterproductive behaviours can be defined as any behaviour that undermines the goals of the organisation and people associated with it, violates organisational norms or leads to decreased productivity (Spector & Fox, 2005). The harmfulness of counterproductive behaviours consists in the volitional and intentional acts taken by the employees, despite being aware of the fact that revealing such conduct may constitute grounds for imposing sanctions by the employer (Spector, 2011).

One of the many classifications available in the relevant literature has been proposed by Spector et al. (2006), where they distinguish five categories of counterproductive behaviours. The first category is abuse towards others i.e. negative behaviours directed at co-workers that cause emotional or physical harm through threats, unpleasant comments, ignoring a given person, undermining their ability to work effectively (Spector, 2011). In addition, abuse includes: using, bullying, ostracizing or discriminating a person, forcing them to behave unethically, demanding additional work from others that is not compensated, expecting employees to be available on the phone after working hours and reply to e-mails (Keashly & Harvey, 2006; Cavaiola & Stout, 2017).

Another category is deliberate reduction of productivity (production deviance). It consists in deliberately lowering the quality of work, making mistakes, abandoning or not taking up tasks. An employee deliberately does not perform the task he was able to perform. Lowering productivity is a passive behaviour that is hardly visible and difficult to prove. Krische, Penney, and Hunter (2010) believe that the underlying cause of lower productivity is perceived low fairness of distribution, when an employee thinks that gratuities they receive are unfairly distributed and that deliberate, incorrect, or slow performance of work helps reduce negative emotions caused by this injustice.

The third type of behaviour is sabotage. According to Ambrose, Seabright, and Schminke (2002), workplace sabotage is a behaviour aimed at destroying, disrupting or subverting the activities of an organisation for the sake of the saboteur's personal goals by creating unfavourable advertising, embarrassment, production delays, material damage, destroying employment relationships or doing harm to employees or customers. Contrary to decreasing productivity, sabotage is an active activity; however decreasing productivity and sabotage are related (Spector et al., 2006). A manifestation of workplace sabotage is also slandering the organisation by employees. Such harmful "anti-advertising" extending beyond the organisation reduces its credibility and damages the company image, which translates into lower customer interest. This type of workplace sabotage has intensified after the increasing access to new media, which gives some employees a false sense of anonymity and impunity (Kot, 2020).

The next behaviour is theft directed at the entire organisation and its individual members. Thefts consist in misappropriating the property of the organisation or other employees, the purpose of which is to deliberately harm others, and they range from petty theft and fraud to embezzlement (Brock et al., 2013). Spector et al. (2006) assume that an employee steals not to harm the organisation, but to achieve a state of justice or simply for material gain.

Another form of counterproductive behaviour is withdrawal, which consists in deliberately reducing the time spent on performing professional duties, as well as reducing the amount of energy spent on work (Spector et al., 2006). Such behaviours include frequent coming late at work, leaving work early, frequent breaks at work, taking longer breaks than permitted, taking unpermitted days off and abusing sick leave. Procrastination in starting tasks and devoting time to substitute activities that make it impossible to perform professional duties are also a big problem. Sometimes employees deliberately set aside a large amount of time to perform relatively easy tasks - thus avoiding being assigned additional duties. One of the most common behaviours that reduce the effectiveness of work is dealing with matters not related to professional duties during working hours (e.g. handling private matters, unjustified use of social media, excessive focus on social life at work (Kricher et al., 2010; Kot, 2020).

2. Present research

An organisation is a very demanding environment where an employee is exposed to time pressure, an increasing number of duties, conflicts and stress. Contemporary professional work can be a source of technostress for people, the effects of stress refer to various areas of human functioning, and may also be linked to counterproductive behaviours. Chen and Spector (1992) have demonstrated that under the influence of various stressors at work people react with direct aggressive actions aimed at both the organisation and co-workers. Krischer et al. (2010) have documented in their study that people engage in counterproductive behaviours (e.g. reduce productivity, withdraw from work) as a way of dealing with stressors, thereby reducing the effects of emotional exhaustion. So far, the studies have not analysed detailed links between technostress and the occurrence of counterproductive behaviours. This study aims to answer the question: what is the relationship between technostress and counterproductive behaviours? This search is expressed by the following hypotheses (H1): There is a positive relationship between Technostress creators and counterproductive behaviours.

On the other hand, the presence of ICT at work is becoming more and more common (Tarafdar et al., 2007; Fuglseth & Sørrebø, 2014). Being aware of its stress-inducing nature, organisations try to take various measures aimed at reducing their inconvenience to employees (Jena, 2015). Providing the necessary knowledge, skills and competences to deal with ICT effectively, ongoing support of the technical department or engaging employees at various stages of implementing a new ICT are factors that reduce technostress (Tarafdar et al., 2015), and thus should counteract the occurrence and escalation of counterproductive behaviours in an organisation (Lee & Park, 2015). Hence, the second research hypothesis (H2) assuming that: There is a negative relationship between Technostress inhibitors and counterproductive behaviours.

2.1 Data analysis

Basic statistical analyses used to calculate descriptive statistics for the collected data have been used for data analysis. In order to verify the hypotheses, Pearson's r correlation tests and the relevant principles of interpretation have been applied (Field, 2010). The calculations were performed in SPSS AMOS 26.0.

2.2. Ethical considerations

The conducted research served scientific purposes. It was approved by a relevant bioethical committee. The research was carried out taking into account ethical principles comprising voluntary, informed and confidential participation of the respondents. In the course

of research performance in accordance with the Declaration of Helsinki, care was taken to maintain the highest standards in terms of designing, collecting, analysing and interpreting the collected data.

3. Method

3.1 Participants and procedure

Altogether, 676 subjects were surveyed. There were 344 women in the surveyed group, which accounts for 50.9%, and 332 men completing the remaining 49.1%. The respondents are economically active people who use technology in their daily work (computers, the Internet, mobile phones). In the surveyed group, 28 respondents (4.1%) had primary education, 336 (49.7%) secondary education, and 312 (46.2%) higher education. In terms of professional experience, 179 (26.5%) respondents worked in the positions using technology for up to one year. 172 (25.4%) respondents worked in such positions from one to five years, and 161 (23.3%) respondents from five to ten years. 164 respondents worked in the positions using technology for over ten years, which accounts for 24.3% of the surveyed group. The age of the subjects ranged from 20 to 63, and the mean age of the subjects was $M = 41.04$, with the standard deviation $SD = 13.46$.

The data was collected via the Internet. Organisations where work requires the use of ICT were asked to provide employees with a request to participate in the study. Employees interested in participating in the study filled in the online version of the methods.

3.2 Measures

The study used the Polish version of Technostress Creators and Technostress Inhibitors Scale consisting of 36 statements. The statements are grouped into 8 scales. Technostress Creators include: Techno-overload, Techno-invasion, Techno-complexity, Techno-insecurity, Techno-uncertainty. The technostress inhibitors that define the factors to counteract experiencing of technostress in the organisation include: Literacy facilitation, Technical support provision, Involvement facilitation. The subject is asked to indicate to what extent they agree with each of the statements. The answers are provided on a scale from 0 to 5, with 0 not applicable, through 1 - strongly disagree to 5 - strongly agree. The result in each of the scales is the quotient of the sum of points obtained from the answers to the questions on that scale, divided by the number of questions included in the scale. Thanks to this method of calculating the results regardless of the number of statements in the scale, it is possible to easily compare the intensity of technostress creators and technostress inhibitors. The range of possible scores is from 0 to 5. The higher the score, the higher the level of technostress creators and technostress inhibitors. The Polish adaptation is characterised by good psychometric properties - the reliability of individual subscales ranges from $\alpha = .86$ to $\alpha = .93$ (Kot, approved for printing).

In order to measure counterproductive behaviours, the Polish adaptation of the Counterproductive Work Behaviour Checklist (CWB-C) was used (Spector et al., 2006; Baka et al., 2015). Unlike the American original version, the Polish version includes four factors, namely sabotage, abuse, theft and withdrawal. The reliability of individual scales in the questionnaire assessed using the Cronbach's α coefficient is $\alpha = 0.84$ for the Sabotage scale, $\alpha = 0.89$ for the Abuse scale, $\alpha = 0.86$ for the Theft scale and $\alpha = 0.71$ for the Withdrawal scale.

In addition to the above-mentioned scale, the study also used a sociodemographic certificate that allowed for collecting the selected demographic variables (gender, age, place of residence) and information on the experience of using ICT at work.

4. Results

Table 1 presents descriptive statistics for the data collected in the study using the Technostress Creators and Technostress Inhibitors Scale and the Counterproductive Behaviours Questionnaire. In the case of Technostress creators and Technostress inhibitors, the results fluctuate around mean values, however, in the case of scales measuring the forms of counterproductive behaviours attention is drawn to the right-skewness of the collected results, suggesting a low saturation of the reported manifestations of counterproductive behaviours.

Table 1
Descriptive statistics and test reliability (N = 676)

Czynniki	Minimum	Maximum	<i>M</i>	<i>SD</i>
Technostress creators				
Techno-overload	0	5	2.56	1.17
Techno-invasion	0	5	2.22	1.15
Techno-complexity	0	5	2.15	1.04
Techno-insecurity	0	5	2.08	1.13
Techno-uncertainty	0	5	2.45	1.27
Technostress inhibitors				
Literacy facilitation	0	5	2.64	1.39
Techno provision	0	5	2.63	1.53
Involvement facilitation	0	5	2.58	1.40
Contrproductive behaviour				
Sabotage	7.00	28.00	8.85	3.40
Abuse	14.00	51.00	19.35	6.92
Theft	5.00	19.00	6.05	2.25
Withdrawal	6.00	25.00	9.82	3.73

Note. N = 676

In order to assess the relationships between technostress factors - Technostress creators (overload, invasion, complexity, insecurity, uncertainty) plus Technostress inhibitors (literacy facilitation, provision, involvement facilitation) and counterproductive behaviours, Pearson's *r* correlation analysis was performed (see Table 2).

Table 2.
Correlations between Technostress creators plus Technostress inhibitors and Counterproductive behaviours

Factors	Sabotage		Abuse		Theft		Withdrawal	
	<i>r</i> Pearson	<i>p</i>	<i>r</i> Pearson	<i>p</i>	<i>r</i> Pearson	<i>p</i>	<i>r</i> Pearson	<i>p</i>
Technostress creators								
Techno-overload	.66	<.001	.49	<.001	.42	<.001	.51	<.001
Techno-invasion	.40	<.001	.28	<.001	.20	<.001	.30	<.001
Techno-complexity	.39	<.001	.33	<.001	.23	<.001	.31	<.001
Techno-insecurity	.39	<.001	.28	<.001	.21	<.001	.30	<.001
Techno-uncertainty	.33	<.001	.21	<.001	.19	<.001	.30	<.001
Technostress inhibitors								
Literacy facilitation	-.24	<.001	-.18	<.001	-.16	.001	-.16	.001
Technical support provision	-.20	<.001	-.14	<.001	-.12	.05	-.12	.05
Involvement facilitation	-.22	<.001	-.15	<.001	-.14	.001	-.15	.001

Note. N = 469.

Pearson's *r* correlation analyses carried out between technostress creators (overload, invasion, complexity, insecurity, uncertainty) and counterproductive behaviours (sabotage, abuse, theft, withdrawal) revealed the occurrence of positive, weak and moderate correlations between all technostress creators (overload, invasion, complexity, insecurity, uncertainty) and counterproductive behaviours (sabotage, abuse, theft, withdrawal). The strongest relationship was observed for Techno-overload. On the other hand, in the case of Technostress inhibitors (literacy facilitation, provision, involvement facilitation) and counterproductive behaviours,

Pearson's r correlation analysis revealed the occurrence of weak negative correlations between the variables - the stronger the intensity of Technostress inhibitors, the lower the intensity of counterproductive behaviours.

5. Discussion

As a result of the applied statistical analyses, the existence of a positive relationship between Technostress creators and counterproductive behaviours was confirmed. Therefore, the first research hypothesis (H1) should be deemed confirmed. In the conditions of occurrence of techno stressors in the working environment and the way of work organisation employees may show a tendency to increased occurrence of counterproductive behaviours, such as Sabotage, Abuse, Theft, Withdrawal. This is confirmed by the results of studies on classic occupational stress, which increases the risk of counterproductive behaviours in organisations (Chen & Spector, 1992; Beattie & Griffin, 2014; Baka, 2017). Although new technologies and the use of ICT in organisations were to improve the work process and support employees, unfortunately and paradoxically they constitute a source of new difficulties and stress. Extending working time, transferring work outside of the workplace, rapid introduction of technological changes, increasing competition from the employees better skilled at ICT may have a negative impact on the mental and physical health of employees and the quality of their work for the organisation (Tarafdar et al., 2007). As in the case of conventional occupational stress, employees sometimes deal with it by revealing counterproductive behaviours (Beattie & Griffin, 2014; Kim & Lee, 2021). Stressful situations in which a person finds themselves may intensify the tendency to engage in various dysfunctional behaviours (e.g. Sabotage, Abuse, Theft, Withdrawal), which constitute a behavioural reaction and a way to minimise unpleasant emotions connected with the experienced stress at work. From an organisational point of view, such behaviours disrupt goals and productivity at work and contribute to the deterioration of the atmosphere at work (Kricher et al., 2010; Lee & Park, 2015; Lee et al., 2014; Tarafdar et al., 2019; Kim & Lee, 2021).

On the other hand, the analyses for the collected results also confirmed a negative relationship between Technostress inhibitors and counterproductive behaviours. Hence, the second research hypothesis (H2) was also confirmed, however these correlations, although significant, are low. Literacy facilitation, Technical support provision and Involvement facilitation are factors that protect against technostress and the occurrence of counterproductive behaviours. The presence of ICT at work is becoming more and more common (Tarafdar et al., 2007; Fuglseth & Sørebo, 2014). Being aware of its stress-inducing nature, organisations try to take various measures aimed at reducing their inconvenience to employees (Jena, 2015). Providing the necessary knowledge, skills and competences to deal with ICT effectively, ongoing support of the technical department or engaging employees at various stages of implementing a new ICT are factors that reduce technostress (Tarafdar et al., 2015), and thus should counteract the occurrence and escalation of counterproductive behaviours in an organisation (Lee & Park, 2015; Liu et al., 2017).

5.1. Practical implications and limitations

In Western countries, studies on the relationship between technostress at work and counterproductive behaviours are quite popular (Lee et al., 2014; Fuglseth & Sørebo, 2014; Tarafdar et al., 2019; Kim & Lee, 2021), which is not the case in Poland. So far, the studies have not analysed detailed links between technostress and the occurrence of counterproductive behaviours, which is a novelty. The presented research has some limitations. Due to the fact that the phenomenon of technostress is complex and multidimensional, the measurement of

physiological indicators could be included in future research on this issue (Liu et al., 2017). By using mixed research regimes more objective empirical data can be obtained. At the same time, it reduces the vulnerability to the variable of social approval, which may be particularly important when measuring such sensitive variables as manifestations of counterproductive behaviours, especially when questionnaire surveys based on self-description of socially undesirable traits are conducted within the organisation. Despite certain limitations, the obtained results have practical implications indicating the need to minimise Technostress Creators among the employees using ICT on a daily basis as factors contributing to the occurrence of counterproductive behaviours. Therefore, the struggle with counterproductive behaviours undesirable from the point of view of the organisation should take place not only by strengthening supervision or control (Kot, 2020), but also by ensuring appropriate working conditions and reinforcing Technostress Inhibitors as factors protecting against technostress, and thus reducing the probability of occurrence of counterproductive behaviours in the organisation, which is of particular importance in the conditions of the Covid-19 pandemic, when more and more jobs are forced to use ICT.

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