

# The Impact of Technostress on Personal Well-Being – an Analysis of Individual and Group Differences

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**Abstract:** This paper is about the impact and extent of technostress on the lives of people, taking into account individual and group differences. A questionnaire was designed from data collected from 34 one-to-one interviews conducted in 2016. Seven hundred and sixty participants completed the questionnaire, together with the General Health Questionnaire which assesses a person's self-reported quality of mental health. Preliminary results indicate that there are significant differences between groups in a variety of aspects in relation to specific aspects of technology which are linked to stress as well as general mental health.

**Keywords:** Technostress, general health questionnaire, gender, age, family

Technological advances have undoubtedly led to advantages in the quality and frequency of communication.<sup>1</sup> However, a dark side seems also to have emerged. In fact, the idea of 'technostress' implies that the use of technology can also be stressful.<sup>2</sup> This may be due to overuse and addiction to easily available equipment such as smartphones and tablets.

One of the factors that seems pervasive in the literature is the issue of gender differences in the use of technology. Broos<sup>3</sup> suggested

- 1 M. Tarafdar, A. Gupta, & O. Turel, 'The dark side of information technology use', *Information Systems Journal*, 23(3) (2013) 269–75.
- 2 C. Brod, *Technostress: The human cost of the computer revolution* (Boston, 1984).
- 3 A. Broos, 'Gender and Information and Communication Technologies (IT) Anxiety: Male

that, faced with a new medium such as the Internet, males were more enthusiastic and tended to develop more positive attitudes towards it. On the other hand, females take a longer time to become familiar with and consequently take a longer time to develop positive feelings for new technology. Wang and Wang<sup>4</sup> indicate that service providers are more likely to be successful if they promote their technologies firstly to male users. Once these users perceive that the technology is beneficial and decide to adopt it, they may use their social influence to encourage their friends and to facilitate the extension of the service. These authors also found that effort expectancy was a stronger determinant of intention for women than for men. Women tend to care much more about technological effort expended in the early stages of a new behaviour.

It has been noted that most studies so far have focused on professional workers who use technology extensively at work. Most studies on the subject are quantitative in nature and tend to examine the effects of technostress on individual outcome variables, namely job satisfaction and stress, and organizational variables, such as reduced efficiency. This paper addresses the research gap by developing a quantitative measure based on a qualitative study<sup>5</sup> to examine the effects of technostress on quality of life as well as to examine demographic differences which could be useful in organizational decision-making. Preliminary results on the differences between various demographic groups are being reported in this paper.

## Methodology

In the first phase of the study, 34 adult working participants from all walks of life were interviewed.<sup>6</sup> Data were analysed using thematic analysis,<sup>7</sup> and the themes elicited were used to design a specific

self-assurance and female hesitation', *Cyberpsychology & Behaviour*, 8(1) (2005), 21–31.

- 4 H. Wang & S. Wang, 'User acceptance of Mobile Internet based on the unified theory of acceptance and use of technology: investigating the determinants and gender differences', *Social Behavior and Personality*, 38(3) (2010), 415–426.
- 5 G. Catania & K. De Giovanni, 'The Effect of Technostress on Work-Family Balance', Paper presented at the British Psychological Society Division of Occupational Psychology Conference, January 2017.
- 6 Catania & De Giovanni.
- 7 V. Braun & V. Clarke, 'Using thematic analysis in psychology', *Qualitative Research in*

questionnaire to measure self-reported indicators of technostress. The questionnaire consisted of three different sections: The Demographic Section; The Technostress Measure Section; and the 12-Item Measure of the General Health Questionnaire.<sup>8</sup> All the questionnaire items save those in the Demographic Section were scored on a fixed-response Likert-type Scale. The questionnaire also contained a short information letter explaining the purposes of the study and emphasizing anonymity and confidentiality of the data obtained. Consent to answering the questionnaire was deemed to be granted if the respondent chose to reply to the questions set.

### **Preliminary data analysis and results**

A preliminary look at the results revealed significant differences according to the demographics. Some of the demographic items had to be regrouped and recoded after obtaining the raw data. The Demographic Section contained questions on the following variables: gender, locality, job/profession, number of hours at work, number of children, number of hours per day using technology, and highest qualification attained. For the Technostress Questionnaire the Likert Scale was scored as follows: 1 = 'Strongly Agree'; 2 = 'Agree'; 3 = 'Disagree'; 4 = 'Strongly Disagree'. For the General Health Questionnaire, the Likert Scale was scored as follows: 1 = 'Better than usual'; 2 = 'Same as usual'; 3 = 'Less than usual'; 4 = 'Much less than usual'.

### **Gender**

Results using the Independent Samples T-Test for Gender indicated gender differences on the following items:

'Have you recently been able to concentrate on whatever you're doing?' (P = 0.038; Mean Males = 2.21; Mean Females = 2.32);

'Have you recently been losing confidence in yourself?' (P = 0.004; Mean Males = 2.47; Mean Females = 2.27);

'Technology makes me feel anxious' (P = 0.013; Mean Males =

*Psychology*, 3(2) (2006), 77–101.

8 D.P. Goldberg & P. Williams, *The user's guide to the General Health Questionnaire* (Windsor, 1988).

2.78; Mean Females = 2.62);

‘Technology makes me feel relaxed’ (P = 0.006; Mean Males = 2.46; Mean Females = 2.62);

‘I feel that I am up to date with technology’ (P = 0.003; Mean Males = 2.14; Mean Females = 2.33).

### **Locality of residence**

For these results, the raw data was simplified to two categories, namely participants residing in Malta and those residing elsewhere. Results using the Independent Samples T-Test indicated differences on the following items:

‘Have you recently felt that you could not overcome your difficulties’ (P = 0.043; Mean Malta = 2.16; Mean Non-Malta = 2.36);

‘By means of a mobile phone I can communicate instantly with everyone else around the world’ (P = 0.046; Mean Malta = 1.39; Mean Non-Malta = 1.52);

‘Online messages include body language’ (P = 0.000; Mean Malta = 3.06; Mean Non-Malta = 3.37);

‘Technology helps me to be more efficient’ (P = 0.007; Mean Malta = 1.82; Mean Non-Malta = 2.04);

‘I prefer to use technology than to communicate face-to-face’ (P = 0.000; Mean Malta = 2.94; Mean Non-Malta = 3.35);

‘By means of technology I can keep abreast of current events’ (P = 0.001; Mean Malta = 1.53; Mean Non-Malta = 1.74);

‘Technology has helped me to feel closer to my friends’ (P = 0.000; Mean Malta = 2.10; Mean Non-Malta = 2.55);

‘Technology has helped me feel closer to my family’ (P = 0.023; Mean Malta = 2.52; Mean Non-Malta = 2.75);

‘Technology makes me feel relaxed’ (P = 0.004; Mean Malta = 2.54; Mean Non-Malta = 2.77);

‘I prefer texting than talking’ (P = 0.000; Mean Malta = 2.98; Mean Non-Malta = 3.37).

**Job/profession**

This category was split into nine different groups, namely ‘Elementary Occupations’; ‘Managerial and Administrative’; ‘Professional’; ‘Retired’; ‘Unemployed’; ‘Student’; ‘Service and Sales’; ‘Arts and Media’; and ‘Other’. Significant differences through One-Way ANOVA, the Student Newman Keuls, or the Least Significant Difference Post-Hoc Tests were attained for the following items:

‘Have you recently been able to concentrate on whatever you’re doing?’ (F = 2.983; P = 0.003; ‘Mean Elementary Occupations = 1.73’; ‘Mean Managerial and Administrative = 2.16’; ‘Mean Professional = 2.20’; ‘Mean Retired = 2.25’; ‘Mean Other = 2.38’; ‘Mean Student = 2.39’; ‘Mean Service and Sales = 2.40’; ‘Mean Arts and Media = 2.43’; and ‘Mean Unemployed = 2.56’). Significant differences are reported between those working in Elementary Occupations and those who declared to be unemployed.

‘Have you recently been able to face up to problems’ (F = 3.082; P = 0.002; ‘Mean Elementary Occupations = 2.18’; ‘Mean Managerial and Administrative = 1.79’; ‘Mean Professional = 2.07’; ‘Mean Retired = 2.25’; ‘Mean Other = 2.31’; ‘Mean Student = 2.12’; ‘Mean Service and Sales = 1.88’; ‘Mean Arts and Media = 1.86’ and ‘Mean Unemployed = 1.80’). Results for this item show that there are significant differences between Managerial and Administrative when compared to students, professionals, and those classified under other. Students also scored significantly lower than those working in services and sales.

‘Have you recently been losing confidence in yourself?’ (F = 1.821; P = 0.070; ‘Mean Elementary Occupations = 2.09’; ‘Mean Managerial and Administrative = 2.43’; ‘Mean Professional = 2.46’; ‘Mean Retired = 3.25’; ‘Mean Other = 2.08’; ‘Mean Student = 2.25’; ‘Mean Service and Sales = 2.29’; ‘Mean Arts and Media = 2.00’; and ‘Mean Unemployed = 2.25’). Results here indicate that those who declared to be retired had a significantly higher level of confidence than the remainder of the participants.

‘Technology does not allow me to rest’ (F = 2.004; P = 0.044; ‘Mean Elementary Occupations = 2.18’; ‘Mean Managerial and Administrative = 2.48’; ‘Mean Professional = 2.53’; ‘Mean Retired = 3.00’; ‘Mean Other = 2.77’; ‘Mean Student = 2.32’; ‘Mean Service and

Sales = 2.46'; 'Mean Arts and Media = 2.29'; and 'Mean Unemployed = 2.88'). Results indicate that professionals perceive that technology does not significantly allow them to rest when compared to students. The unemployed also scored significantly higher than students and those working in elementary occupations.

'I prefer to use technology than to communicate face-to-face with people' (F = 3.944; P = 0.000; 'Mean Elementary Occupations = 2.09'; 'Mean Managerial and Administrative = 2.86'; 'Mean Professional = 3.09'; 'Mean Retired = 2.75'; 'Mean Other = 2.62'; 'Mean Student = 3.02'; 'Mean Service and Sales = 3.08'; 'Mean Arts and Media = 2.86'; and 'Mean Unemployed = 3.63'). Results indicate that the mean for the unemployed group shows that this group significantly prefers to use technology than other and elementary occupations subgroups. The mean for elementary occupations indicates that this group significantly prefers to use technology when compared to students, those working in services in sales, professionals, and unemployed.

'By means of technology I can communicate with my old friends' (F = 2.086; P = 0.035; 'Mean Elementary Occupations = 1.55'; 'Mean Managerial and Administrative = 1.89'; 'Mean Professional = 1.70'; 'Mean Retired = 2.00'; 'Mean Other = 2.00'; 'Mean Student = 1.86'; 'Mean Service and Sales = 1.73'; 'Mean Arts and Media = 2.29'; and 'Mean Unemployed = 1.56'). Those working in Arts and Media scored significantly higher than professionals, those working in services and sales, elementary occupations, and the unemployed.

'Technology has helped me feel closer to my family' (F = 2.354; P = 0.017; 'Mean Elementary Occupations = 1.91'; 'Mean Managerial and Administrative = 2.35'; 'Mean Professional = 2.66'; 'Mean Retired = 2.75'; 'Mean Other = 2.38'; 'Mean Student = 2.62'; 'Mean Services and Sales = 2.48'; 'Mean Arts and Media = 3.00'; and 'Mean Unemployed = 2.44'). Results for this item indicate that those in elementary occupations score significantly lower than those who work in the arts and in the media.

### **Number of hours at work**

This category was also divided into two subsections, namely those who spend 40 hours or more at work, and therefore are essentially full-time

workers, and those who are unemployed or who work part-time. There were no significant differences for any of the items on the technostress questionnaire but there were significant differences on two of the items of the General Health Questionnaire. These items were as follows:

‘Have you recently felt capable of making decisions about things?’ (P = 0.040; Mean working under 40 hours = 1.96; Mean working over 40 hours = 1.83)

‘Have you recently felt constantly under strain?’ (P = 0.027; Mean working under 40 hours = 2.06; Mean working over 40 hours = 1.84).

### **Number of children**

This variable was divided into four different categories and a one-way ANOVA together with Student Newman Keuls and Least Significant Difference Post-Hoc Tests were used. The categories were those without children, those who have 1 child, those with 2 children, and those with 3 children (no participants reported having more than 3 children). Significant differences were found for the following items:

‘Sending online messages and SMSs created misunderstandings’ (F = 5.490; P = 0.001; Mean no children = 2.00; Mean 1 child = 2.14; Mean 2 children = 2.26; Mean 3 children = 2.47). For this item, a significant difference was indicated between participants with no children and those who had 3 children.

‘I prefer to use technology than to communicate face-to-face’ (F = 3.061; P = 0.028; Mean no children = 3.00; Mean 1 child = 3.02; Mean 2 children = 3.09; Mean 3 children = 2.41). Participants who declared to have 3 children significantly preferred to use technology than the other participants.

‘I prefer texting than talking’ (F = 4.211; P = 0.006; Mean no children = 3.07; Mean 1 child = 2.82; Mean 2 children = 3.16; Mean 3 children = 2.71). For this item, those declaring to have 2 children under their care significantly showed less preference to text than those who declared to have 3 children under their care.

‘I feel that I am up to date with technology’ (F = 3.591; P = 0.014; Mean no children = 2.20; Mean 1 child = 2.29; Mean 2 children = 2.48; Mean 3 children = 2.47). Those with 2 children significantly indicated

that that they felt less up to date with technology than those with no children.

### **Number of hours per day using technology**

This variable was divided into two different categories: Those who used technology for 10 hours or less and those who used technology for 11 hours or more. An independent samples T-test yielded the following significant differences between these two groups on the following items:

‘Have you recently felt that you were playing a useful part in things?’ (P = 0.007; Mean 10 hours or less = 1.99; Mean 11 hours or more = 2.19)

‘Have you recently been able to face up to problems?’ (P = 0.029; Mean 10 hours or less = 1.99; Mean 11 hours or more = 2.13)

‘Have you recently been feeling reasonably happy all things considered?’ (P = 0.007; Mean 10 hours or less = 1.97; Mean 11 hours or more = 2.17)

‘Technology helps me to be more efficient’ (P = 0.049; Mean 10 hours or less = 1.87; Mean 11 hours or more = 1.75)

‘I prefer to use technology than to communicate with people face-to-face’ (P = 0.037; Mean 10 hours or less = 3.05; Mean 11 hours or more = 2.88)

‘I feel that I am up to date with technology’ (P = 0.005; Mean 10 hours or less = 2.33; Mean 11 hours or more = 2.12)

‘Technology allows me to work all the time’ (P = 0.000; Mean 10 hours or less = 2.29; Mean 11 hours or more = 2.02)

### **Highest qualification attained**

For this variable, a one-way ANOVA with Student Newman Keuls and Least Significant Difference Post-Hoc Tests were used. There were five categories for this variable: Group 1 = O levels and Secondary School; Group 2 = A levels; Group 3 = Diploma; Group 4 = Degree; and Group 5 = Masters’ and Ph.D. The following items yielded significant differences between groups:



‘Sending online messages and SMSs creates misunderstandings’ ( $F = 3.674$ ;  $P = 0.006$ ; Mean O levels and Secondary School = 2.31; Mean A levels = 1.98; Mean Diploma = 2.21; Mean Degree = 2.04; Mean Masters’ and Ph.D. = 2.16). Results indicate that those in both the A levels and Degree groups scored significantly differed from those in the group with O levels and Secondary school level of education in that they thought that sending online messages and SMSs created more misunderstandings.

‘Online messages include body language’ ( $F = 4.247$ ;  $P = 0.002$ ; Mean O levels and Secondary School = 2.86; Mean A levels = 3.29; Mean Diploma = 3.07; Mean Degree = 3.21; Mean Masters’ and Ph.D. = 3.08). For this item, those with O levels and Secondary school level of education were significantly more likely to think that online messages included body language than those who attained a degree and those who attained their A levels.

‘Technology has helped me feel closer to my friends’ ( $F = 2.616$ ;  $P = 0.034$ ; Mean O levels and Secondary School = 2.04; Mean A levels = 2.22; Mean Diploma = 2.18; Mean Degree = 2.23; Mean Masters’ and Ph.D. = 2.48). Results indicate that those with O levels and secondary school level of education indicated that technology has significantly helped them to feel closer to their friends than respondents with a Masters’ and/or Ph.D.

‘I prefer texting than talking’ ( $F = 2.711$ ;  $P = 0.029$ ; Mean O levels and Secondary School = 2.85; Mean A levels = 3.17; Mean Diploma = 2.94; Mean Degree = 3.15; Mean Masters’ and Ph.D. = 3.13). Results indicate that those with O levels and a secondary level of education scored significantly indicated that they preferred texting to talking than those with A levels and those with a degree. Those with A levels scored significantly worse than those with a diploma.

## **Discussion and preliminary conclusions**

The aim of this study was to examine the effects of technostress on quality of life. With technology being such an essential and widespread phenomenon, it is important to consider both positive and negative effects that this phenomenon might have on workers and

their personal lives and to find specific ways in which these can be addressed. Preliminary results indicate that there are gender differences in the effects of technology. Males seem to be significantly less able to concentrate and more prone to losing confidence in themselves. Males also declare that technology makes them feel significantly more anxious than females.

Statistical differences between Maltese residents and foreigners seem to indicate that, on the whole, the Maltese are more positive where it comes to technology. In fact, there was only one item on the General Health Questionnaire for which those residing outside of Malta seemed more resilient, namely the item which asked about overcoming difficulties. Maltese people generally indicated that they perceived that technology helps them to be more efficient, that they prefer to use technology than to communicate face-to-face, that they could keep abreast of current events, that it helps them to feel closer to friends and family, that technology makes them feel relaxed, and that they prefer to text rather than talk.

With regard to type of job or profession, those working in elementary occupations seem to be significantly better able to concentrate on what they are doing compared to the unemployed. Those working in services and sales as well as those in managerial and administrative occupations seem to be better equipped to face up to problems compared to other occupations. Retired persons had a significantly higher confidence in the use of technology when compared to participants performing other jobs. Professionals perceive that technology does not allow them to rest compared to students. The unemployed indicated that technology did not impede their rest periods compared to students and those working in elementary occupations. Results also indicate that the mean for the unemployed group shows that this group significantly prefers to use technology rather than communicating face-to-face with people when compared to the other and elementary occupations subgroups. Those working in the arts and the media seem to be significantly less inclined to use technology to communicate with their old friends when compared to professionals, those working in services and sales, elementary occupations, as well as the unemployed. Furthermore, those in elementary occupations significantly perceive technology to have helped them to feel closer to their family.

Our research in relation to the number of hours spent at work did not yield many significant results. However, this could have been because of the way the data was organized. Those working for more than 40 hours were significantly more capable to make decisions and also felt less constantly under strain.

The number of children under care yielded surprising results. In fact it seems that communicating through technology with children does not create misunderstandings. Sending online messages and SMSs significantly created fewer misunderstandings for those having 3 children than those with no children. Participants who declared to have 3 children also prefer to use technology than to communicate face-to-face compared to the remainder of the participants. Those declaring to have 2 children under their care significantly showed less preference to text than those who declared to have 3 children under their care. Furthermore, participants with 2 children felt the least up to date with technology than those with no children. However, since the study did not collect information about the ages of the children, a confounding variable could be at work here. It is not clear whether the age of the children has an effect on these results.

With regard to use of technology, results were quite predictable. Those who worked 11 hours or more felt significantly better at being a useful part of things, declared to be more efficient, prefer to use technology than to communicate face-to-face with people, feel more up to date with technology which allows them to work all the time. On the other hand, this subgroup felt less significantly able to face up to problems and felt less reasonably happy.

Results indicate that those in both the A levels and degree groups significantly agreed more to the fact that online messages and SMSs create misunderstandings than those in the group with O levels and Secondary school level of education. This latter group significantly agrees more with the fact that online messages include body language better than those who attained a degree and those who attained their A levels. The same group also feels that technology has helped them feel closer to friends compared to those with a Masters' and Ph.D. Moreover, this group also declared that they prefer texting to talking compared to those with A levels and with a degree.

The above results indicate that organizations need to be more aware on how their employees are using technology both at the workplace and also outside working hours. During working hours, it might be the case of enforcing discipline with regard to social media in certain workplaces. Another issue is the promotion of the safe use of technology by means of the organization of workshops or training sessions aimed at informing employees on the use and misuse of technology as well as giving frequent tech-free breaks.

### **Limitations and suggestions for further research**

While the sample size for the study was very large, the fact that convenience sampling, rather than random sampling, was used might indicate difficulties in the generalizability of the results. Also, the psychometric characteristics of the newly designed Technostress Measure have not yet been determined.

Further research could involve the determination of psychometric properties of the Technostress Measure, including determining test-retest reliability and the underlying factor structure through exploratory and confirmatory factor analysis. The significant results from this study can also be used to design studies to investigate in more detail the particular differences between different demographic groups' acceptance of technology and the possible effects of the use of technology.

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