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Demographic and occupational determinants of technical overload, techno-intrusion and techno-complexity

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Abstract. Main goal of this paper was to draw more attention to the pervasiveness of technostress in the consulting environment. As TS tends to be perceived differently in terms of what it entails, authors have focused, instead, on its relationship with such demographical variables as gender, age, work level and family status in the research. Study was conducted using a quantitative questionnaire. Sample consisted of 702 consulting employees (417 men and 275 women) aged 18-65. Data analysis was based on ANOVA and stepwise regression models. Results reveal that female participants and employees older than 35, experience significantly more Techno-Complexity compared to other groups. No significant effect of family status on Techno-Complexity was found. Senior-rank employees experience more Techno-Overload and Techno-Invasion, compared to co-workers in more junior positions. The authors' findings point out to the necessity of workplace-stress prevention solutions focusing specifically on gender, age and the seniority level of an employee. The Results imply that such focus can prove essential in the prevention of burnout and considerable decrease in individual stress levels, loss of workplace focus and overall workplace productivity

Keywords: information and communication technology; stress, technology; technostress; workplace

INTRODUCTION

The concept of "technostress" (TS) has been introduced in response to the need to describe an array of psychological reactions to unfavourable computer use. Seminal research in the domain identifies TS as a contemporary adjustment disease, caused by an incapability to cope with the demands of the current information and communication technology that may result in stress, anxiety, or overall distress. More recently, TS experience has been explained by a negative spiral of deterioration. Research has identified the main de-

terminants of the spiral to be low personal resources and low technological self-efficacy. Significance of these determinants is reflected in their capacity to extend authors' critical understanding concerning the adverse effects of the interaction between elevated technological expectations and low technological means. In particular, the effects that lead to psychosocial disorders such as techno strain and adverse organizational consequences such as low performance (Pflügner *et al.*, 2021).

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Breadth of TS definition deemed it necessary for researchers to identify its more specific sub-categories (La Torre *et al.*, 2019). Furthermore, early as well as the recent studies have also revealed a more direct link of these creators, and TS, to specific demographic variables (Stadin *et al.*, 2020). These studies demonstrate significant associations between gender (Marchiori *et al.*, 2019), age, work level (Bakker and Demerouti, 2018) and workplace TS. P. Borle *et al.* (2021) studied the relationship between technological stress factors and mental health and work results in the context of the techno-stress model. The researchers found empirical evidence of the connection between various types of techno-stressors and negative consequences for the mental health of employees, such as stress, burnout, and reduced life satisfaction. At the same time, they did not offer ideas for reducing the level of technological stress in companies.

S. Yener *et al.* (2020) analysed the impact of TS on employee burnout and their productivity, and also considered potential factors that moderate this relationship. In this study, it was established that employees with a higher level of technological self-efficacy experience less negative impact of TS on the reduction of labor productivity. At the same time, the researchers did not reveal ways to increase the level of technological self-efficacy among employees.

X. Cheng *et al.* (2023) concluded that while Techno-Overload and techno-intrusion increase intentions to avoid technology, techno-insecurity (feelings of incompetence in using technology) actually decreases this avoidance. At the same time, the authors did not reveal the reasons for the formation of techno-uncertainty among employees of various categories. D.R. Dunaeatz (2022) proposed his own definition of “technostress”, under which the researcher understands the negative psychological and physiological effects caused by the inability to productively and healthily cope with the demands of new technologies. At the same time, he did not classify the reasons for the formation of this condition among employees of different age and professional categories.

N. Aprilia & A.L. Riani (2023) came to the conclusion that technostressors should be attributed to the system of stressors associated with the use of information and communication technologies. The researchers established that highly developed psychological capital of employees can counteract the spread of TS. At the same time, this article did not specify recommendations for company managers to reduce the level of technological stress among employees in conditions of digitalization.

However, the literature review has pointed out to an important gap, this study attempts to bridge. Namely, the lack of more substantial critical quantitative research on family status as an indicator of organizational TS. And, additionally, how it links to gender, age and work level to form a cluster, which affords a space

for the identification of the breadth of impact each indicator has on the current profile of organizational TS within the consulting environment.

Taking the above insights and identified gaps as its starting point, present work builds its explanatory account by focusing on three sub-dimensions of TS – Techno-Overload, Techno-Invasion and Techno-Complexity, the author’s quantitative study identifies as integral to the in-depth understanding of the extent and the implications of the present-time organizational TS for the consulting workforce. Accordingly, the main aim, and contribution, of this study was the determination of specific associations between gender (male and female), age (18-35 and 36+), levels at work (analysts, associates; consultants; managers, senior managers, leadership), family status (participants with children and participants without children) and TS creators (Techno-Overload, Techno-Invasion, Techno-Complexity). Consequently, the following hypotheses were formulated:

H₁ – Employees’ gender will influence how a person perceives Techno-Overload.

H₂ – Employees’ gender will influence how a person perceives Techno-Invasion.

H₃ – Employees’ gender will influence how a person perceives Techno-Complexity.

H₄ – Employees’ age will influence how a person perceives Techno-Overload.

H₅ – Employees’ age will influence how a person perceives Techno-Invasion.

H₆ – Employees’ age will influence how a person perceives Techno-Complexity.

H₇ – Employees’ work level will influence how a person perceives Techno-Overload.

H₈ – Employees’ work level will influence how a person perceives Techno-Invasion.

H₉ – Employees’ work level will influence how a person perceives Techno-Complexity.

H₁₀ – Employees’ family status will influence how a person perceives Techno-Overload.

H₁₁ – Employees’ family status will influence how a person perceives Techno-Invasion.

H₁₂ – Employees’ family status will influence how a person perceives Techno-Complexity.

LITERATURE REVIEW

Current literature shows that gender is an important factor influencing the level of TS (Tams *et al.*, 2018). Such a discrepancy in the perception and response to technostressors among men and women signals the need to more carefully examine the specific relationship between gender and TS (Marchiori *et al.*, 2019). The following research responds to this critical call and implements it in the form of initial guiding hypotheses (1-3) to investigate the role of gender as a potential moderator of the relationship between various factors of TS and its consequences. Aside from gender salience,

recent studies also suggest age salience. Specifically, older people have been found to experience significantly higher levels of TS compared to younger individuals (Chen & Muthithcharoen, 2017; Pflügner *et al.*, 2020), due to their vulnerability to physical weakening (González-López *et al.*, 2021; Tams *et al.*, 2022). However, certain studies have also revealed the countertendency that suggests younger individuals experience higher levels of TS. Such inconsistency, as in the case of gender, necessitates further critical research. The following work responds to this gap by putting to the practical test its second set of hypotheses (4-6).

Compared to the evidential and explanatory divergence above, studies focused on the employees' work level have indicated a direct effect link between this indicator variable and TS (Bakker and Demerouti, 2018; La Torre *et al.*, 2020). Employees have, in particular, been found to experience different levels of TS with respect to different work levels such as technical staff, blue-collar and white-collar workers, managers and supervisors. However, what these studies leave as an open question is whether work levels significantly predict each type of TS. In this respect, this work contributes to the pool of potential answers by putting to direct test the work-level related hypotheses (7-9). A limited number of studies have also looked at the relationship between TS and family status. One such study has

indicated a significant correlation between TS and family status (Harris *et al.*, 2022).

However, there is currently only limited additional empirical evidence and studies examining the more specific effect of family status on either on Techno-Overload, Techno-Invasion and Techno-Complexity (Rigglea *et al.*, 2021). This is especially the case with respect to the effect of having children or not. As to the authors' knowledge there have not been any recent studies specifically addressing this link to TS. The present study aims to fill a gap in the literature by providing a reliable preliminary quantification of the effect that having children has on employees' TS levels (hypotheses 10-12).

MATERIALS AND METHODS

A convenience sampling technique was used as a foundation for the quantitative study. The sample consisted of German participants, recruited from a publicly traded consulting company whose additional fields of expertise include technology and related outsourcing. The company's workforce consists of close to 624,000 employees worldwide, 11,000 of whom are located in Germany. The target sample totalled 707 employees across different city offices. Following the sample adequacy analysis, five participants were excluded from the final analysis as outliers resulting in a total of 702 participants aged 18 to 65 years (Table 1).

Table 1. Demographics of variables

		N	%
Gender	Female	275	39.2
	Male	417	59.4
Age	18-35	401	57.1
	36+	301	42.9
Level at work	Analyst + Associate	257	36.6
	Consultant	190	27.1
	Manager + Senior Manager + Leadership	255	36.3
Family status	Participants with Children	251	35.8
	Participants without Children	451	64.2

Source: compiled by the authors

The Technostress Creator instrument employed in this study is an adaptation of the test battery originally developed by M. Tarafdar *et al.* (2007). The latter builds its empirical power on five TS sub-scales: Techno-Overload, Techno-Invasion, Techno-Complexity, Techno-Insecurity and Techno-Uncertainty. In accordance with its focus, this study has adapted the original instrument so as to maximize the potential of the three sub-scales in particular: Techno-Overload (5 items), Techno-Invasion (4 items) and Techno-Complexity (5 items). Mean scores were calculated for the subcategories. Higher scores translate to a higher perception related to the sub-scales. The item scoring follows a standard 5 item Likert scale (not at all true = 1, slightly true = 2, neutral = 3, much true = 4, and very much true = 5). Cron-

bach's alpha reliability values were calculated at 0.81 and 0.89 in M. Tarafdar *et al.* (2007) study, and 0.79 and 0.85 in the present study.

In the present study, gender, age, employee's work level and family status constituted the independent variables. The following questions: "Do companies need more training to prevent TS?", "Do women experience more TS?", "Do older people experience more TS?" and "Are rules against TS are financially demanding?", Techno-Overload, Techno-Invasion and Techno-Complexity constituted the study's dependent variables. A set of demographic variables was dummy coded, and the variables were entered as categorical predictor variables for Techno-Overload, Techno-Invasion and Techno-Complexity.

An online survey was designed and implemented using Quicksurvey. The chosen distributive channel was e-mail. Survey was officially distributed among the employees in September 2021. To ensure internal legal and ethical compliance, the questionnaire was submitted to the company's legal department and employee council prior to the distribution. Out of a total of 11,042 questionnaires, 707 (7.1%) have been submitted. Following the data cleaning phase, 702 questionnaires have qualified for statistical analysis. As the missing information was less than 5%, no data imputation algorithms have been utilized. Data was statistically analysed for reliability, differences and associations between variables.

Collected data were analysed using SPSS 25.0/MAC software. Normality assumption was based on the

computation of the skewness and kurtosis values, which were found to be within the acceptable range for a normal distribution (Table 2). Five outliers were excluded from the data following the results of the box plot analyses. To test for multicollinearity, authors computed Pearson correlation coefficients among variables, variance inflation factor (VIF), and tolerance values. According to B.G. Tabachnick *et al.* (2007), the VIF value should be lower than 4, while the tolerance should be higher than 0.2. Authors' findings indicated that the VIF and tolerance values of this study were within the acceptable range, suggesting that the assumption of multicollinearity was not violated. Assumptions of linearity and homoscedasticity were tested and found to be satisfied. The residuals were reasonably rectangular, and the data was collected in the centre.

Table 2. Descriptive statistics

Variables	N	Range	Min.	Max.	Mean	SD	Skewness	Kurtosis	α
Techno-Overload	702	4	1	5	3.04	1.04	-0.2	-0.83	0.85
Techno-Invasion	702	4	1	5	2.35	1	0.46	-0.58	0.79
Techno-Complexity	702	3.4	1	4.4	2	0.84	0.78	-0.12	0.8

Source: compiled by the authors

Descriptive statistics (frequencies, means and SD) and one-way analysis of variance (ANOVA) were performed in order to examine the collected data and investigate if single items such as: "Do companies need more training to prevent TS?", "Do women experience more TS?", "Do older people experience more TS?", "Are rules against TS financially demanding?", Techno-Overload, Techno-Invasion, and Techno-Complexity differed with respect to demographic variables. Tukey's HSD tests was used for the purpose of post hoc comparisons. Regression analysis was preceded by the phase where demographic variables were dummy coded. The values in the regression model were coded as "1", while other categorical values in the groups were coded as "0" to differentiate the effects of each category on the dependent variables. The final phase has included the stepwise regression analyses.

Consent was taken from both the company and the employees prior to the study. All participants have been previously informed about the purpose of the research as well as that all the collected data will only be used for research purposes and, as such, are fully anonymized. To make sure the study meets all the necessary ethical requirements, the researcher herself has devised it according to the relevant German laws and regulations. In addition, the article follows the research and publication ethical guidelines recommended by the Council of Science Editors, International Committee of Medical Journal Editors and the World Association of Medical Editors.

RESULTS

Techno-Overload, Techno-Intrusion, and Techno-Complexity are different manifestations of technological stress that occurs in workers due to excessive use of digital technologies and related demands. To effectively study and form a general understanding of technological stress, it is advisable to analyse the signs and characteristics of each of its subtypes.

A condition in which the amount of information, messages, tasks, and demands associated with the use of technology exceeds a person's ability to process and effectively perform them is a manifestation of technical overload (Aprilia & Riani, 2023). It can affect the development of the employee's feeling of constant time pressure and the impossibility of getting everything done. People who are in this state may experience anxiety, stress, and difficulty concentrating due to an excessive flow of information. Thus, the signs of technical overload include a feeling of overload due to an excessive amount of information, messages, and tasks related to the use of technologies; difficulties with the organization and efficient processing of large volumes of data; feeling of constant pressure and impossibility to do everything in time. In this case, it is also important to determine the factors contributing to the appearance of technical overload. First of all, it should be noted the increase in the number of sources of information, in particular e-mail, messengers, social networks, mobile applications. In addition, the need to constantly be in touch and respond to messages also negatively

affects the emotional state of the employee. Another factor contributing to the prevalence of technology overload may be the increase in workloads and tasks that are performed with the help of technology. A lack of skills among employees to effectively manage time and information also has a negative impact. At the same time, it should be emphasized that the consequences of technical overload can be expressed in employees in different ways, for example, in exhaustion, reduced productivity, difficulties with concentration, and sleep disorders (Borle *et al.*, 2021).

As for techno-invasion, it encompasses the violation of boundaries between work and personal life through the use of technology. The constant availability of employees thanks to smartphones, messengers and e-mail creates in them an expectation of immediate response and communication support at any time. This can lead to the feeling that work and technology are invading an employee's private life, taking away time for rest and recovery. In connection with techno-intrusion, people may experience irritation, loss of control, and difficulty separating work from personal life. Based on the above, it is possible to single out such signs of this state as the feeling that technologies invade the private life and violate the personal boundaries of the employee, as well as the emergence of difficulties in distinguishing between professional and domestic tasks. As for the factors that lead to the spread of techno-invasion, they include the proliferation of mobile devices and the ability to be connected anytime, anywhere (Cheng *et al.*, 2023). In addition, in modern conditions, the work culture is being reformed, which accordingly encourages employees to be constantly available and promptly respond to requests. This process is also influenced by the popularity of remote workers with flexible schedules, which blurs the boundaries between work and free time.

Manifestations of techno-intrusion can be constant interruptions and distractions due to messages, calls, and notifications during free time, and the inability to "disconnect" from work and have a full rest. Also, this condition can be expressed in employees in the context of a conflict between the demands of work and family/personal life. Effective ways to overcome this problem can be: establishing clear boundaries of availability and mode of operation; turning off notifications and messages at inappropriate times; and organizational policy to support work-life balance. Separately, it is worth emphasizing the priority of training the management team on the importance of this balance, as well as the organization of pieces of training on time management, prioritization, and digital well-being. The implementation of the listed measures is necessary to preserve the mental health of employees, their family well-being, and general productivity (Kluge *et al.*, 2019). At the same time, it should be understood that it requires efforts on the part of both employees and organizations to create a culture that supports

healthy boundaries between work and private life in the age of digital technologies. It is expedient to pay special attention to techno-complexity, which is associated with the difficulties employees face when learning and using new, often complex, technologies and software. It is worth noting that constant updates and changes in technology require continuous training and adaptation from employees. In the opposite case, Techno-Complexity can provoke feelings of powerlessness and frustration in such subjects. Moreover, complex interfaces and systems can be perceived as obstacles to effective work. A manifestation of the development of Techno-Complexity in a person can be the appearance of a feeling of incompetence when working with complex systems. In addition, it is necessary to emphasize the possible decrease in the employee's productivity due to the time spent on training and adaptation, as well as the biased attitude towards technological innovations due to the fear of complexity. The reasons for the development of Techno-Complexity among employees may be age and cognitive differences in the perception and assimilation of new technologies. It should also be noted about the low level of digital skills and technological literacy among individual employees. The last factor is due to the lack of educational resources and support in mastering new programs, as well as the hasty introduction of technologies without proper training of users (Marchiori *et al.*, 2019).

To overcome employees' resistance to changes and increase the efficiency of their use of the potential of new technologies, it is advisable to implement a system of measures. First of all, investments should be allocated for training and development of digital skills among employees, as well as developing intuitive, user-friendly interfaces and programs. In addition, it is important to provide affordable technical support and advice during the gradual introduction of new technologies in companies. Another way to overcome Techno-Complexity is to involve employees in the process of developing and testing programs. This approach will encourage them to share knowledge and experience (Tams *et al.*, 2022). The implementation of the proposed methods for overcoming Techno-Complexity will allow to an increase in the level of efficiency of the use of technologies in production, as well as contribute to increasing the productivity of employees and their job satisfaction. Accordingly, organizations must make efforts to simplify technology, train employees, and create an enabling environment for them to master new digital tools (Pv & Viswanathan, 2021). This will maximize the benefits of technological innovation and minimize the associated stress and complexity.

The above-mentioned phenomena, namely technical overload, techno-invasion, and Techno-Complexity can overlap, and in this connection strengthen the influence of each other and form a complex state of technological stress. It should be noted that they are closely

related to human characteristics (for example, age, gender, level of technological literacy), professional factors (field of activity, workload, corporate culture), and personal circumstances (marital status, lifestyle). ANOVA analysis was conducted to determine the specific level of influence of each of the external characteristics during the study. ANOVA analysis has revealed that females scored higher compared to male participants, suggesting women experienced more TS (Table 3). Compared

to the 36+ participants, the younger participants scored higher commenting older people experienced higher levels of TS. In terms of the participants' work level, consultants, managers, senior managers, and leaders scored higher compared to associates and analysts stating women in general experienced more TS. Finally, with respect to family status, the analysis showed the participants with children to score higher compared to participants without children when tested for TS levels.

Table 3. ANOVA test of the relation between demographic factors of respondents and the following statements

Variables	Groups	Do companies need more training to prevent TS?		Do women experience more TS?		Do Older People Experience More TS?		Are Rules against TS Financially Demanding?		Notes
		M (SD)	F	M (SD)	F	M (SD)	F	M (SD)	F	
Gender	Female	3.64 (1.15)	2.26	0.26 (0.44)	14.65***	0.81 (0.39)	1.16	0.26 (0.44)	0.60	Women TS: Female>Male
	Male	3.56 (1.18)		0.14 (0.35)		0.78 (0.42)		0.29 (0.45)		
Age	18-35	3.64 (1.14)	0.88	0.19 (0.39)	0.004	0.84 (0.37)	16.02***	0.29 (0.46)	0.25	Older TS: 18-35>36+
	36+	3.55 (1.24)		0.19 (0.39)		0.72 (0.45)		0.27 (0.45)		
Level at work	Associate + Analyst ^a	3.66 (1.1)	1.952	0.18 (0.39)	2.897**	0.87 (0.34)	1.279	0.37 (0.49)	0.962	Women TS: b, c>a
	Consultant ^b	3.67 (1.18)		0.24 (0.43)		0.79 (0.41)		0.28 (0.45)		
	Manager + Senior Manager + Leadership ^c	3.60 (1.18)		0.23 (0.42)		0.80 (0.40)		0.26 (0.44)		
Family status	With children ^a	3.59 (1.16)	1.07	0.2 (0.4)	0.69	0.83 (0.38)	11.72***	0.29 (0.45)	0.12	Older People TS: a>b
	Without children ^b	3.72 (1.1)		0.21 (0.42)		0.88 (0.33)		0.24 (0.44)		

Note: ***p < 0.001; **p < 0.01; *p < 0.05

Source: compiled by the authors

Female participants exhibited significantly higher Techno-Complexity scores compared to the male participants (Table 4). Participants older than 35 exhibited significantly higher Techno-Complexity scores compared to the 35-year-old and younger participants. In terms of work level, managers, senior managers, and leaders exhibited a higher level of Techno-Overload and Techno-Invasion compared to consultants, associates, and analysts. On the other hand, consultants had higher Techno-Overload and Techno-Invasion scores compared to associates and analysts. Finally, in terms

of Techno-Complexity, participants with children scored higher compared to those without children. Findings following the stepwise regression analysis revealed levels of manager, senior manager, and leadership to have a significant positive impact on both Techno-Overload and Techno-Invasion. Furthermore, the three work levels explained 1% of the total variance in the case of Techno-Overload and Techno-Invasion (Table 5). Gender, age, different work levels (analysts, associates, consultants), and having children or not, did not exhibit any significant impact on either Techno-Overload or Techno-Invasion.

Table 4. ANOVA test of Techno-Overload, Techno-Invasion, and Techno-Complexity in demographics

Variables	Groups	Techno-Overload		Techno-Invasion		Techno-Complexity		Post hoc results
		M (SD)	F	M (SD)	F	M (SD)	F	
Gender	Female	3.1 (1.06)	1.62	2.33 (1.01)	0.25	2.09 (0.87)	5.07*	TC: Female>Male
	Male	3 (1.02)		2.36 (0.97)		1.94 (0.8)		
Age	18-35	2.99 (1.02)	2.41	2.32 (0.98)	1.15	1.86 (0.77)	25.24***	TC: 36+>18-35
	36+	3.11 (1.06)		2.4 (1.01)		2.18 (0.89)		

Table 4, Continued

Variables	Groups	Techno-Overload		Techno-Invasion		Techno-Complexity		Post hoc results
		M (SD)	F	M (SD)	F	M (SD)	F	
Level at work	Associate + Analyst ^a	2.93 (1)	3.13 [*]	2.22 (0.94)	5.39 ^{**}	1.93 (0.84)	1.23	TO: c>b>a
	Consultant ^b	3.02 (1.08)		2.32 (1.02)		2.04 (0.85)		TI: c>b>a
	Manager + Senior Manager + Leadership ^c	3.16 (1.04)		2.5 (1.01)		2.03 (0.83)		
Family Status	With children ^a	3.07 (1.02)	0.48	2.37 (0.98)	0.16	2.11 (0.9)	6.57 ^{**}	TC: a>b
	Without children ^b	3.02 (1.04)		2.34 (1)		1.94 (0.8)		

Note: ***p < 0.001; **p < 0.01; *p < 0.05; TO – Techno-Overload; TI – Techno-Invasion; TC – Techno-Complexity

Source: compiled by the authors

Table 5. Stepwise regression analyses predicting Techno-Overload and Techno-Invasion

Dependent Variables	Predictors	B	t	Sig.	R	R ²	F	Sig.
Techno-Overload	Managers; Senior Managers; Leadership	0.09	2.34	0.019	0.09	0.01	5.49	0.02
Techno-Invasion	Managers; Senior Managers; Leadership	0.12	3.08	0.002	0.12	0.01	9.51	0.002

Source: compiled by the authors

The follow-up stepwise regression analysis has shown the 18-35 age group to be significantly predictive of Techno-Complexity in a negative way (Model 1), predicting 3.5% of the total variance (Table 6). In the second model, the 18-35 age group had a negative

impact on Techno-Complexity, while the female gender impact was positive, explaining about 5% of the total variance in Techno-Complexity. Contrariwise, 35+ age, male gender, work level and having children or not did not show any significant impact on Techno-Complexity.

Table 6. Stepwise regression analyses predicting Techno-Complexity

Models	Age	B	t	Sig.	R	R ²	F	Sig.
1	18-35 years-old	-0.187	-5.024	0	0.19	0.035	25.24	0
2	18-35 years-old	-0.208	-5.55	0	0.22	0.049	18.05	0.001
Female		0.122	3.243	0.001				

Source: compiled by the authors

Based on the above, it can be stated that TS is a common phenomenon among employees of various demographic and professional categories. Understanding and addressing the prevalence of this problem is becoming increasingly important for businesses as technology continues to permeate all areas of their professional lives and operations. In this regard, companies must develop effective strategies to reduce technological stress among their employees. In this case, it is advisable to focus on teaching them digital skills, establishing clear boundaries between work and personal life, optimizing work processes and providing adequate technical support.

DISCUSSION

Present study contributes to the extension of the current literature on TS within the consulting workforce, by

systematically assessing and quantifying the specificities of the relationship between gender, age, work levels, family status and the three formative indicators – Techno-Overload, Techno-Invasion and Techno-Complexity. An additional contribution of this study is its focus on the previously unexamined workforce culture in this context, i.e., the German consulting employees' culture. The onset point of this critical study was the investigation of the connection between gender and the three above-mentioned indicators. As identified in the sections above, previous research approaches show considerable inconsistency in terms of findings. This is particularly the case with studies focusing on the gender-TS relation which are characterized by considerable contradictions. In effect, a body of research suggests female population experiences more TS than male population, e.g., due to higher computer anxiety.

Finally, certain number of most recent studies also suggests no significant association between gender and TS (Özgür, 2020; Pv & Viswanathan, 2021).

On a more fine-grained level, findings do indicate that gender influences TS, particularly if authors focus on the three singled out TS indicators. Specifically, studies by D.M. Marchiori *et al.* (2019) and C.B. Califf & S. Brooks (2020) demonstrate that women experience higher Techno-Complexity, whereas men experience higher Techno-Overload and Techno-Invasion. G. La Torre *et al.* (2020) study reveals women to experience Techno-Overload, Techno-Invasion and Techno-Complexity more commonly than men. Such lack of consensus deems further critical investigations necessary. Particularly those investigations that analyse Techno-Overload, Techno-Invasion and Techno-Complexity through the lens of gender, and especially in a setting where people have more similar characteristics, e.g., the same profession (Sareen, 2019). With respect to this, present study contributes evidence that demonstrates female consultants to have significantly higher Techno-Complexity (H_3) scores than their male counterparts. Furthermore, evidence also shows female gender to have a positive impact on Techno-Complexity. Females explained about 2% of the entire variance of Techno-Complexity. However, gender has no significant impact on Techno-Overload (H_1) and Techno-Invasion (H_2). Overall, current evidence extends the literature on consulting workforce TS in terms of novel gender-related findings. Additionally, it indicates a more likely link between female consulting population and Techno-Complexity than with Techno-Overload and Techno-Invasion.

The study has, additionally, examined the connection between age and the three above-mentioned indicators. Results indicate that employees' age had a significant positive impact on Techno-Complexity (H_6), but not on Techno-Overload (H_4) or Techno-Invasion (H_5). Specifically, participants older than 35 had significantly higher Techno-Complexity scores compared to the 35-years-olds and younger, indicating the 18-35 age range to predict Techno-Complexity in a negative way. This, consequently, points to the potential of TS levels, (Techno-Complexity, in particular), to increase with age. What, additionally, supports this tendency is the original assumption that older adults are more susceptible to interruptions and their aftereffects compared to younger adults, particularly in light of age-specific cognitive capabilities span. More recently, S. Tams *et al.* (2018) provide additional practice-informed insights indicating that older employees may experience higher Techno-Complexity due to age-specific cognitive skills changes. Similarly, other relevant recent studies also regard age to be a significant TS-influencing factor (Özgür, 2020). S. Tams *et al.* (2018) explain above to be the case due to the lack of consensus originating from the fact that majority of research does not draw on theories of aging. In its attempt to bridge this gap, t

concerning the association between employees' age and TS, this study contributes new empirical evidence in support of the link between the increased age and difficulties to adapt at to new technologies.

Following age, next focus point was the examination of the connection between work levels and Techno-Complexity, Techno-Overload and Techno-Invasion. In this respect, present research contributes evidence in support of H7 and H8. More specifically, managers, senior managers, the leadership, and consultants exhibited higher levels of Techno-Overload (H_7) and Techno-Invasion (H_8) compared to associates and analysts. No significant difference was detected in the case of Techno-Complexity (H_9). This implies managerial, senior managerial, leadership, and consultant work levels to have a significant positive effect on both Techno-Overload and Techno-Invasion, but no such effect on Techno-Complexity. In support of these findings, recent researcher recent research findings indicate Techno-Overload and Techno-Invasion to be especially demanding for management-level employees (Li & Wang, 2020; Pflügner *et al.*, 2021). Because senior work levels struggle to adapt to new technological developments due to excess responsibility, they tend to reorder habits and daily routines resulting in Techno-Overload and Techno-Invasion increase. Overall, employees at higher work levels experience Techno-Invasion, due to the conviction they should be constantly connected.

Finally, the results obtained by means of regression analysis did not support any of the family-status related hypotheses (H_{10} - H_{12}). More specifically, having children or not did not have any significant impact on Techno-Overload, Techno-Invasion or Techno-Complexity. Likewise, J. Kluge *et al.* (2019) found no significant difference in the level of TS between participants who had children and those who did not. However, an important finding resulted from the ANOVA analysis. It has revealed higher Techno-Complexity scores in the case of participants with children compared to those without children. Potential explanation for this tendency is that the former lack sufficient time to adopt new technological developments due to the child-care demands, making them in turn more prone to TS. Additional insightful conclusions involve the ANOVA analysis results concerning the difference of TS levels in terms of gender, age and levels at work. For instance, female participants showed higher TS levels compared to male participants, indicating a greater tendency of the former to experience TS. Considering age, younger participants reported significantly less TS than older ones. Other informative findings include the consultants, managers, senior managers, and the leadership stating that women experience more TS compared to other work levels.

These outcomes point to various important implications for organizations as well as researchers working on the employee-related TS. The research gaps it reveals and the new findings it contributes make this

study a productive point of reference for understanding the breadth of impact various variables such as gender, age, work levels and family status, previously not investigated in such a setting and combinatorial arrangement, can have on specific TS dimensions as Techno-Overload, Techno-Invasion and Techno-Complexity. Employers and organizations willing to safeguard their employees from TS can use these findings to devise adequate employee training programs and orientations that would provide them both with psychological and organizational assets to effectively deal with Techno-Overload, Techno-Invasion and Techno-Complexity. Accordingly, deeper understanding of the various TS dimensions and how technological developments impact people can lead to a significant decrease in physical, emotional and psychological harm.

CONCLUSIONS

The main power of the present study lies in its cross-sectional design, which affords greater informational versatility compared to other designs concerning the defining characteristics of a population under research. One drawback of such a design is that it does not allow for cause-and-effect associations to be built. Other important limitations of the present study concern its general applicability, as its participant pool consisted exclusively of the employees from a consulting company in Germany. On the other hand, the benefit of such a specific study is that it can serve as a pool of data-supported ideas for larger-scale studies involving employees from various sectors and different

world regions. Final limitation of the study is its adoption only of the quantitative approach. Future research can, therefore, utilize the power of a mixed method for gathering richer data on organizational TS, facilitating thus also cross-validation.

Despite its limitations, this study has within its scope also contributed beneficial practice-informed insights concerning the existence and nature of TS in the German consulting environment. It contributes to the current literature by demonstrating significant associations between work levels, age, gender, family status and TS as well as its more specific sub-dimensions of Techno-Overload, Techno-Invasion and Techno-Complexity. Specifically, the study's novel contribution concerns the finding that older female employees experience significantly more Techno-Complexity, while the family status shows no effect on it. Additional novel contribution is also the finding that senior employees experience more Techno-Overload and Techno-Invasion compared to their co-workers in junior positions.

Overall, the present research results indicate not only the importance, but also the necessity of stress prevention solutions that specifically focus on employee gender, age, and the seniority level as the main starting points for the effective prevention of TS.

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CONFLICT OF INTEREST

None.

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Демографічні та професійні детермінанти технічного перевантаження, техноінтрузії та технокомплексності

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Анотація. Основною метою цієї статті було привернути більше уваги до поширеності техностресу в консалтинговому середовищі. Оскільки TS сприймається по-різному щодо його змісту, автори зосередились на вивченні його зв'язку з такими демографічними змінними, як стать, вік, рівень роботи та сімейний статус. Дослідження проводилося за допомогою кількісного опитувальника. Вибірка складалася з 702 працівників консалтингових компаній (417 чоловіків і 275 жінок) у віці від 18 до 65 років. Аналіз даних базувався на ANOVA та моделях ступінчастої регресії. Результати показують, що жінки-учасники та працівники старше 35 років відчувають значно більшу технічну складність порівняно з іншими групами. Сімейний статус не має значного впливу на технічну складність. Старші співробітники відчувають більше технічного перевантаження та техно-інвазії порівняно з колегами на нижчих посадах. Висновки авторів вказують на необхідність рішень щодо запобігання стресу на робочому місці, зосереджуючись конкретно на статі, віці та стажі роботи працівника. Результати свідчать про те, що така зосередженість може виявитися необхідною для запобігання вигоранню та значного зниження індивідуальних рівнів стресу, втрати концентрації на робочому місці та загальної продуктивності на робочому місці

Ключові слова: інформаційно-комунікаційні технології; стрес; технологія; технострес; робоче місце