Who is Stressed by Using ICTs? A Qualitative Comparison Analysis with the Big Five Personality Traits to Understand Technostress

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Abstract. The purpose of the current study is to reveal personality profiles that predispose to the experience of techno-stressors within an organizational setting. These insights are useful because techno-stressors lead to considerable costs and adverse health effects. We use the theoretical lens of the transaction-based model of stress to study the effect of the Big Five personality traits on techno-stressors. We distributed a self-rating questionnaire among 221 individuals and analyzed data using fuzzy set Qualitative Comparison Analysis. The results reveal that six different personality profiles lead to the experience of techno-stressors. The study contributes to research by revealing that personality traits need to be investigated in profiles when studying their role in technostress and that different profiles of the Big Five predispose to techno-stressors. The results are useful for practitioners as they allow the prevention of techno-stressors and negative consequences by detecting users who are at risk at an early stage.

Keywords: technostress, personality profiles, Big Five, fuzzy set Qualitative Comparison Analysis (QCA), configurations

1 Introduction

In today's society, people heavily depend on information and communication technology (ICT). Nowadays, living and working without them is hardly conceivable. However, using ICTs can be stressful [1], which is known as technostress [2]. The term was first defined as a disease of adaptation that results from an insufficient dealing with new computer technologies [3]. In current Information Systems (IS) literature, it refers to "*stress that individuals experience due to their use of information systems*" [4, p. 2]. Stress in the workplace leads to substantial costs for organizations and the national economy as well as considerable health impairment for employees. Researchers estimate the annual costs of workplace stress, e.g. by reduced productivity, absenteeism, and compensation, at $300 billion in the United States, and €20 billion in the EU-15 countries [5]. Technostress depicts an important aspect of stress in the workplace [6]. It is caused by different stimuli, called techno-stressors [2, 7]. In order to diminish financial costs of technostress and adverse consequences like health impairment, it is exceptionally relevant to understand what factors (e.g. personality traits of the user)

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predispose to the experience of techno-stressors. Such knowledge allows detecting at an early stage, which employees with what personality traits are at risk. Based on this detection, preventive measures and interventions for the reduction of techno-stressors for employees at risk can be implemented even before negative consequences arise.

IS research has mainly focused on evaluating consequences of techno-stressors [2, 7–10] and *environmental or technological characteristics* that precede techno-stressors [1, 10]. The investigation of preceding *characteristics of the user* that increase or decrease techno-stressors has received little attention [4]. This is the case although other research strands beyond technostress inform us that if an individual experiences stressors does not only depend on environmental or technological characteristics, but also characteristics of the individual [11]. Findings suggest that characteristics of the individual include personality traits, which means that personality traits predispose to the level of stressors [12–14]. In line with that, first results from IS research indicate that personality traits are relevant to technostress [8, 9]. The findings reveal that personality traits influence the reaction to techno-stressors and the consequences of techno-stressors [9]. However, the depicted technostress research has two shortcomings: (1) It was not focused on personality traits as predisposing factors to techno-stressors [4] and (2) it has examined personality traits independently, which may only reveal '*half of the picture*' or even lead to false conclusions of the role of personality on techno-stressors [15]. Every user is characterized by various personality traits that coexist, forming a personality profile [16]. Thus, the current study aims to answer the following question: **Which profiles of personality traits predispose to techno-stressors?**

To answer the research question, we base on the transaction-based model of stress [11] and focus on employees working in organizations and experiencing techno-stressors as part of their daily work. Regarding personality traits, we focus on the Big Five personality traits, which reflect higher-level factors [15, 17]. They capture user personality on the most general level and cover most facets of a user's personality. The investigation of Big Five personality traits is analogous to other research in the field of IS [8, 9].

By addressing the research question, we contribute to IS research in the field of technostress and personality. Despite the relevance of technostress and even though we know that personality traits influence the reaction to techno-stressors, personality traits as *predisposing factors* to techno-stressors have not been studied so far in a comprehensive way, referring to premier journals and conferences. Moreover, we highlight the importance of investigating personality profiles within personality research. If a user experiences techno-stressors does not depend on the pure presence of absence of a single personality trait. Instead, it depends on his or her profile of personality traits. We refer to profile of personality traits (equivalent to personality profile) as the specific bundle of the Big Five personality traits. Users have different personality profiles and within each profile, these five personality traits are present to a varying degree. Finally, this research also contributes to practice by revealing personality profiles of how ICTs can evoke techno-stressors and thereby pave the way to reduce the experience of techno-stressors, e.g. through interventions, preventive measures, or sensitization of executives.

2 Theoretical Background

To study how personality profiles predispose to techno-stressors, the transaction-based model of stress [11] guides our research. The theoretical model has been widely used in plenty of different research streams, including technostress literature [2, 4, 18] (for an overview of theories in technostress research see also [19]). Based on that, we introduce the concepts of techno-stressors and personality traits, before depicting the current state of research in these two areas.

2.1 Techno-stressors and Personality in the Transaction-Based Model of Stress

Techno-stressors in the Transaction-Based Model of Stress. The increasing use of ICTs at work as well as daily life expects users to permanently adapt to new functionalities, applications, and work flows. In fact, ICTs act as a new source of stress, which is referred to as technostress [2, 10]. In line with the transaction-based model, *technostress* is a process that results as a combination of a stimulation condition (techno-stressor) and a user's response to the condition (strain). Thus, *technostress* is referred to as the overall process, including techno-stressors, strain, and appraisal as well as coping processes. *Characteristics of the environment* (e.g. organization or technology) and *characteristics of the user* (e.g. personality) precede and influence techno-stressors through appraisal processes [4]. *Techno-stressors* (also called *technostress creators*) are stressful situations caused by ICTs that result in strain [7]. Alleviating factors mitigate the relationship of techno-stressors and strain [4] through coping processes [4, 11, 20]. *Strain* refers to the consequences of techno-stressors. It is the result of being exposed to techno-stressors [10] (see Figure 1).

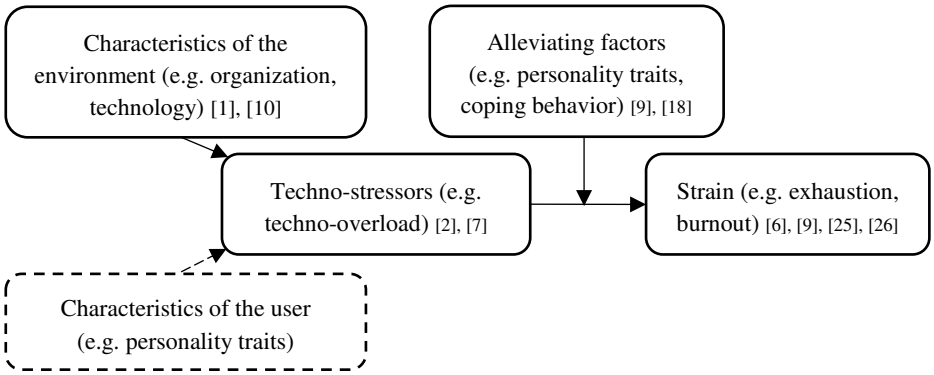

Figure 1. Overview of aspects of technostress and relevant literature. Dotted lines refer to the research gap addressed by the current study.

Personality Traits in the Transaction-Based Model of Stress. Psychological literature informs us that stressors are preceded by characteristics of the individual [11, 20]. Additionally, previous IS research informs us that personality traits as characteristics of the user play an important role in IS contexts as they influence user

beliefs and behaviors (for a review see: [21]). The overall tenet thereby posits that personality traits can be captured on different hierarchical levels, whereby these differ regarding their breadth and stability [17]. Broad traits reflect user personality at the highest hierarchical level. At this level, the well-known Big Five personality traits [22] describe elements of an individual's personality. The Big Five personality traits include *neuroticism* (the tendency to experience unpleasant emotions such as anxiety easily), *extraversion* (the tendency to seek the stimulation of others), *openness to experience* (the tendency to prefer new experiences over routines), *conscientiousness* (the tendency to act in a planned and duty-oriented manner), and *agreeableness* (the tendency to cooperate with others) [23]. These five traits are commonly seen as context-free and stable and are useful to understand beliefs and behaviors across different situations [17]. Since the Big Five as broad traits capture user personality on the most general level and cover most facets of a user's personality, we focus on that level.

We have now introduced the concepts of techno-stressors and personality traits and depicted how these are connected. The transaction-based model of stress helps us to understand that personality traits as characteristics of the user precede and influence if an employee experiences techno-stressors. Based on that knowledge, we will now illustrate relevant research findings from the technostress and personality stream. By that, we will reveal research gaps and clarify where the study at hand extends existing research.

2.2 Research Findings Regarding Technostress and Personality

In the following, results from the technostress literature will be explained first, followed by a linkage to personality traits with a focus on IS literature.

Findings Regarding Techno-stressors. Previous research has discussed five techno-stressors. The techno-stressor *techno-overload* describes situations in which users face an increase of work amount and speed due to ICTs. *Techno-invasion* refers to situations where users feel the need to be permanently connected to work and where the line between work and personal life becomes blurred due to ICTs. *Techno-complexity* describes situations where ICT-related complexity leads users to the feeling of inadequate skills and to spend time as well as effort to understand the different aspects of ICTs. *Techno-insecurity* refers to situations where users fear losing their job due to other employees with better ICT skills or due to the replacement by an ICT. Finally, *techno-uncertainty* describes situations where users feel uncertainty because of ongoing changes in ICTs and where they are constantly forced to adapt, learn, and educate themselves about new ICTs [2, 7]. The five mentioned techno-stressors are commonly used in IS research [2, 9, 10].

Findings Regarding Strain. The exposition to techno-stressors leads to increases in strain that are non-beneficial consequences of techno-stressors [10] (for a review see: [4, 24]). In this context, techno-stressors have been linked to adverse job-related consequences like decreases in satisfaction with the ICT, performance, innovation, job satisfaction, and commitment [2, 7, 10]. Additionally, techno-stressors lead to adverse well-being-related consequences like exhaustion, burnout, overall strain, and lower work engagement [1, 6, 8, 9, 18]. These quantitative results are supplemented by

qualitative results, suggesting that techno-stressors lead to problems in concentration, sleep, identity, and social relation [25]. It is worth noting that consequences of techno-stressors do not only manifest on a behavioral or emotional level, but also on a biological level [24]. Stress that arises from the use of ICTs even leads to physiological changes. Research in a laboratory experimental setting revealed that the experience of techno-stressors, induced by a system breakdown or high frequency of instant messages, results in endocrinological changes in terms of an incidence in stress hormones [26, 27].

Findings Regarding Preceding and Alleviating Factors. Research has examined technology characteristics that precede techno-stressors, e.g. usefulness, reliability, and presenteeism [1]. Recently, the interest in examining coping strategies that help dealing with techno-stressors has increased. In line with that, aspects of personal control that influence the effect of techno-stressors on strain have been investigated [18].

Findings Regarding User Personality and Technostress. With regards to personality research in IS, research has among others used the Big Five personality traits to show that these influence technological beliefs in terms of perceived usefulness and ease of use [28] as well as user behavior [29]. From the strand of technostress, research informs us about two aspects. First, we see that the Big Five personality traits, such as extraversion and neuroticism, influence how users react to techno-stressors [8]. This means that users high on neuroticism or low on extraversion are more exhausted from using ICTs. Second, we know that the Big Five determine how techno-stressors influence job burnout and job engagement [9]. This means that whether a user is high or low on extraversion determines, among others, if a given level of techno-stressors produces job burnout. In Figure 1, we have summarized the mentioned concepts and have linked them to relevant technostress literature with a focus on studies that have investigated predisposing or alleviating factors to techno-stressors. Moreover, the leverage point of the study at hand is shown dashed.

To sum it up, previous research on technostress emphasizes that there are different techno-stressors that lead to wide-ranging non-beneficial consequences and are preceded by specific technological and organizational characteristics. However, it remains a research gap that no knowledge exists about which personality traits precede whether a user experiences techno-stressors (as shown dashed in Figure 1) (referring to premier journals and conferences). In latest IS literature, there is the claim to investigate how personality traits influence if a user experiences techno-stressors [4] to understand what factors increase the likelihood that ICTs are experienced as stressful. In addition to this research gap and claim, existing studies do not account for the effects of coexisting personality traits, building personality profiles. We know that the Big Five form distinct personality profiles. This suggests that multiple profiles exist, which differ in their personality traits, but all predispose to techno-stressors. Thus, there might be profiles that predispose to techno-stressors, but there might also be profiles of personality traits that do *not* predispose to techno-stressors. Thus, if a user experiences techno-stressors might not depend on the pure presence or absence of a single personality trait. Instead, it might also depend on the presence or absence of other personality traits that coexist and form employees' personality profile. Yet, so far, research has not considered which different personality profiles predispose to techno-

stressors. This knowledge is essentially important to prevent, intervene, and foster the handling of techno-stressors.

To address the mentioned research gaps, we apply a configurational approach using fuzzy set Qualitative Comparison Analysis (fsQCA) [30]. Previous research on user personality emphasizes that there are three different hierarchical levels. Thereby, it is recommended to initially focus on broad traits, particularly if no previous research exists that identifies other, more specific, narrower traits [31]. Therefore, we focus on the Big Five personality traits [16] to explain how personality profiles predispose to experiences of techno-stressors. Having in mind that techno-stressors result in adverse consequences like decreased performance and IT use, the results allow the drawing of propositions to positively react to techno-stressors and related adverse effects.

3 Method

We next describe the data collection process as well as the used measures, and outline the validity and reliability of the measurement model. We then explain our data analysis using fuzzy set Qualitative Comparison Analysis (fsQCA) [30], which has been successfully used in IS research to examine different personalities using individual level data [32, 33].We use this approach to reveal which configurations of different personality traits lead to the same outcome (techno-stressors). Here, configurations are equivalent to profiles of the Big Five personality traits. Thus, each configuration encompasses the five personality traits that are pronounced with varying degree.

Data Collection. The sampling strategy is to get a broad spectrum of participants who are familiar to work with IS on a regular basis as their profession. Therefore, we chose to invite cloud workers using Amazon Mechanical Turk (mTurk). Those participants professionally work with IS and mostly have additional occupations in organizations [34]. We prepared an online survey and used mTurk, which has become an established approach in IS research and is equal to traditional data collection approaches [35]. To ensure a high quality of our data, we embedded two attention tests in our survey. Overall, 239 individuals participated, however, we removed 18 participants as they failed the attention tests. The final sample consists of 221 participants. Thus, the sample size is large enough, as the ratio of conditions (here: the Big Five) to number of participants should be smaller than 0.2 and in this study we have a ratio of 0.022. This means fsQCA only requires a sample of 25 observations, yet our sample size is eight times as large [36]. Individuals who successfully participated in the survey received $ 0.20. The characteristics of the final sample are shown in Table 1.

Table 1. Sample characteristics (in per cent) of 221 participants

Age (in years)	< 20	1.0	ICT use (hours per week)	< 10	10.9
	20-29	40.1		10-19	12.5
	30-39	40.7		20-29	16.2
	40-49	12.5		30 – 39	16.1
	> 49	5.7		> 39	44.3
Sex	Female	39.1	IT professional	No	64.6
	Male	60.9		Yes	35.4

We followed recommendations for self-reported data [37] and tested for common method bias. For this, we applied Harman's single factor test, which reveals that one factor only explains 37 percent of the variance, which is below the recommended threshold of 50 percent [38]. Additionally, we examined the correlation matrix (see Table 4), which does not reveal any high correlations [39]. In summary, we can state that common method bias is not an issue in this study.

Measures. To measure the Big Five personality traits, we base on existing items [9]. For openness to experience we used three items, yet one item was removed because the loading was below the recommended threshold [40]. For neuroticism, we used three items and for agreeableness three items, but one item was removed due to a low loading. To measure conscientiousness and extraversion, we used three items each [9]. To measure techno-stressors, we used the five techno-stressors and measured overall techno-stressors as a second-order construct resulting of the five stressors [2]. Therefore, we base all techno-stressor items on Ragu-Nathan [2]. We measured techno-overload by five items, but we removed one item because of a low loading. We used four items to measure techno-complexity and again removed one item due to a low loading. We used five items for techno-complexity, four for techno insecurity, and four for techno-uncertainty. All items were measured on a 7-point Likert-type agreement scale, ranging from 1 (completely disagree) to 7 (completely agree) (see Table 2).

Table 2. Measures

Techno-overload [2], $\alpha = 0.86$	I am forced by ICTs to work much faster. [0.795] I am forced by ICTs to do more work than I can handle. [0.882] I am forced by ICTs to work with very tight time schedules. [0.881] I have a higher workload because of increased ICT complexity. [0.743]
Techno-invasion [2], $\alpha = 0.79$	I have to be in touch with my work even during my vacation due to ICTs. [0.896] I have to sacrifice my vacation and weekend time to keep current on new ICTs. [0.900] I feel my personal life is being invaded by ICTs. [0.720]
Techno-complexity [2], $\alpha = 0.86$	I do not know enough about ICTs to handle my job satisfactorily. [0.721] I need a long time to understand and use new ICTs. [0.962] I do not find enough time to study and upgrade my ICT skills. [0.741] I find new recruits to this organization know more about ICTs than I do. [0.719] I often find it too complex for me to understand and use new ICTs. [0.787]
Techno-insecurity [2], $\alpha = 0.86$	I feel constant threat to my job security due to new ICTs. [0.853] I am threatened by coworkers with newer ICT skills. [0.891] I do not share my knowledge with my coworkers for fear of being replaced. [0.800] I feel there is less sharing of knowledge among coworkers for fear of being replaced. [0.725]
Techno-uncertainty [2], $\alpha = 0.83$	There are always new developments in the technologies we use in our organization. [0.745] There are constant changes in computer software in our organization. [0.846] There are constant changes in computer hardware in our organization. [0.803] There are frequent upgrades in computer networks in our organization. [0.852]

Openness [9], α = 0.87	I see myself as creative. [0.961] I see myself as imaginative. [0.921]
Neuro-ticism [9], α = 0.75	I see myself as moody. [0.799] I see myself as easily upset. [0.846] I see myself as anxious. [0.817]
Agreeable-ness [9], α = 0.75	I see myself as sympathetic. [0.728] I see myself as kind. [0.991]
Conscien-tiousness [9], α = 0.74	I see myself as dependable. [0.761] I see myself as self-disciplined. [0.714] I see myself as organized. [0.909]
Extraver-sion [9], α = 0.85	I see myself as extraverted. [0.894] I see myself as enthusiastic. [0.851] I see myself as talkative. [0.880]

Measurement Model. To ensure content validity we only used items that have been used and validated in previous research. Each item used in this study has a loading above 0.707, which attests indicator reliability [2]. We can attest construct reliability because the average variance extracted (AVE) of each construct is higher than 0.50 and the composite reliability (CR) is higher than 0.70. Furthermore, we can attest discriminant validity, as we conducted the heterotrait-monotrait (HTMT) ratio, which is 0.68 and consequently below the threshold of 0.85 [41]. The square root of the AVE is higher than the corresponding correlations of the constructs [42, 43] (see Table 4).

Data Analysis Using fsQCA. To analyze which configurations of the five personality traits predispose to techno-stressors, we take a configurational approach [44]. More precisely, we use fuzzy set Qualitative Comparison Analysis (fsQCA) [30], which enables us to study techno-stressors as the result of a configuration of personality traits. In this study, a configuration refers to a specific bundle of the five personality traits which can predispose to techno-stressors and where each personality trait is expressed through a fuzzy set. Using fuzzy sets allows us to express the degree to which a measure belongs to a personality trait.

The *data analysis of configurations sufficient for techno-stressors* consists of four subsequent steps [30, 45]. First, for the *calibration* of the survey data into fuzzy sets, we applied the direct calibration, as recommended in QCA literature [44, 45]. For this, we used three recommended qualitative anchors (value 1 for full non-membership, value 4 for the crossover point, and value 7 for full membership) and calibrated the survey data [44, 45]. The resulting fuzzy sets are used in the subsequent steps of the analysis. Second, based on the fuzzy sets, we perform the *construction of the truth table*, which lists all possible configurations of the five personality traits. Third, after constructing the truth table, we applied the recommended thresholds to reduce the truth table to *meaningful configurations* [46]. In line with previous research [45, 47], we applied a frequency threshold of three, meaning that all configurations with less than three observations are dropped from further analysis. In conformity with QCA literature [46], we applied a *consistency threshold* of 0.90, meaning that only configurations with a consistency of at least 0.90 are considered in the analysis. Consistency is a measure

that captures the extent to which a configuration leads to the studied outcome [30]. This means that the extent to which a configuration of personality traits predisposes to the sum of techno-stressors is measured. By applying those two thresholds, we reveal configurations that are sufficient in bringing about techno-stressors [45]. Sufficient means that every time the configuration of these personality traits is present, the experience of techno-stressors is present as well.

4 Results

In this section, we will outline the findings of the analysis of configurations sufficient for techno-stressors.

Six Different Configurations of Personality Traits Predispose to the Experience of Techno-stressors. Results reveal six alternative configurations of personality traits sufficient for predisposing to techno-stressors. We draw on graphical illustration of the configurations for readability reasons (see Table 3).

Table 3. Configurations of personality traits predisposing to the experience of techno-stressors

Configuration / Conditions	*The neurotic-agreeable personality profile* C1	*The neurotic-conscientious personality profile* C2	*The agreeable-conscientious personality profile* C3	*The neurotic-agreeable and conscientious personality profile* C4	*The open-extraverted and agreeable personality profile* C5	*The open-neurotic personality profile* C6
Openness to experience			⊗	⊗	●	●
Neuroticim	●	●		●	⊗	●
Agreeableness	●	⊗	●	●	●	⊗
Conscientiousness	⊗	●	●	●	⊗	
Extraversion	⊗	⊗	⊗		●	⊗
Raw coverage	0.38	0.36	0.36	0.37	0.37	0.36
Unique coverage	0.03	0.01	0.02	0.02	0.03	0.01
Consistency	0.90	0.90	0.90	0.90	0.91	0.91
Solution coverage	0. 60					
Solution consistency	0. 81					

Note: Black circles (●) indicate the presence of a personality trait, white crossed-out circles (⊗) the absence of a personality trait, and blank spaces indicate a '*don't care*' situation. In this case, the trait plays a subordinate role and may be either present or absent. C means configuration.

The configurations are translated in the following way: Black circles indicate the presence of a personality trait, white crossed-out circles the absence of a personality trait, and blank spaces indicate a '*don't care*' situation. In this case, the trait plays a subordinate role and may be either present or absent. The configurations (C1 – C6) are named based on their main characteristics, e.g. neurotic-agreeable personality profile (C1), as users with this configuration show high levels of neuroticism and agreeableness. In summary, we identified the following configurations (personality

profiles): Neurotic-agreeable (C1), neurotic-conscientious (C2), agreeable-conscientious (C3), neurotic-agreeable and conscientious (C4), open-extraverted and agreeable (C5), and open-neurotic (C6).

The solution coverage of 0.60 indicates the degree of how much of the outcome (here: techno-stressors) is covered by the six configurations. Thus, the six configurations account for 60 percent of the membership in the outcome, which illustrates a high explanatory power of the configurations [48]. In line with recommendations in QCA literature [46], the solution consistency of 0.81 as well as the consistency of each configuration exceed the minimum value of 0.80. The raw coverage of the six configurations expresses the "*proportion of membership in the outcome explained by each term of the solution*" [49, p. 86], which means the extent to which the configuration covers the cases of the outcome, and ranges from 0.36 to 0.38. The six unique coverage values range from 0.01 to 0.03, expressing the unique contribution of each configuration under exclusion of the contribution of other configurations [30].

Each of the Six Configurations that were Identified Substantially and Equally Contribute to Experiencing Techno-stressors. Comparing the six configurations, the raw coverage scores and unique scores are comparable, meaning that the configurations explain techno-stressors to an equivalent extent. Furthermore, the configurations have comparable relative importance for explaining techno-stressors. To further assess the mentioned results, we discuss them in the following section, providing theoretical and practical relevance as well as future research directions.

Table 4. Descriptive statistics

Constructs	M	SD	CR	AVE	1	2	3	4	5	6	7	8	9	10
1 Open	5.39	1.34	0.94	0.89	0.94									
2 Neuro	3.95	1.32	0.86	0.67	-0.06	0.82								
3 Agree	5.43	1.11	0.85	0.74	0.19	-0.17	0.85							
4 Cons	5.29	1.21	0.83	0.63	0.16	-0.14	0.09	0.79						
5 Extra	4.28	1.47	0.91	0.76	0.27	-0.16	0.32	0.16	0.87					
6 TO	3.88	3.88	0.90	0.70	0.06	0.20	0.06	-0.04	0.10	0.84				
7 TInv	3.97	3.96	0.87	0.69	0.17	0.10	0.05	0.08	0.11	0.60	0.83			
8 TC	3.12	3.12	0.89	0.63	-0.10	0.09	-0.02	-0.02	0.15	0.35	0.28	0.79		
9 TU	3.08	3.10	0.89	0.66	0.22	0.13	-0.08	0.10	0.13	0.29	0.37	0.23	0.81	
10 TIns	4.73	4.73	0.89	0.61	-0.09	0.19	-0.04	-0.04	0.04	0.51	0.41	0.65	0.28	0.78

Note: square root of AVE is listed on the diagonal of bivariate correlations; techno-stressors are calculated as the sum of constructs 6 to 10, Open = openness, Neuro = neuroticism, Agree = agreeableness, Cons = conscientiousness, Extra = extraversion, TO = techno-overload, TInv = techno-invasion, TC = techno-complexity, TU = techno-uncertainty, TIns = techno-insecurity, M = mean, SD = standard deviation; CR = composite reliability; AVE = average variance extracted

5 Discussion

Using information and communication technologies (ICTs) can lead to the experience of techno-stressors, which in turn results in negative consequences for organizations, e.g. reduced productivity, and for users, e.g. emotional exhaustion [7, 9]. For both sides,

knowledge about what factors predispose to this type of stress is relevant to address and deal with it. The aim of the paper at hand is to provide a better understanding of the interplay of personality traits influencing users' experience of techno-stressors. We base on the transaction-based model of stress [11, 20] to explain that personality profiles influence the level of techno-stressors that employees experience, which in turn influences health and organizational consequences [9, 10, 26]. To answer the research question, we test for different personality profiles leading to techno-stressors, and discovered six profiles of the Big Five personality traits by the application of fsQCA. In the following, we outline the theoretical and practical implications followed by limitations and possible areas of future research.

Theoretical Contributions. The current research contributes to the two research strands of technostress and personality as illustrated in the following.

Up to now, personality traits as predispositions to techno-stressors have gained little attention (see Figure 1). Personality traits are characteristics of the user. Existing literature revealed personality traits to directly influence the consequences of techno-stressors, e.g. exhaustion [8], and to moderate the relationship between techno-stressors and consequences like burnout and job engagement [9].

Thus, the study at hand adds the importance of personality traits, especially profiles of personality traits, as predispositions to techno-stressors to existing literature (as shown dashed in Figure 1). The findings illustrate that there is not one single personality profile, which leads to techno-stressors. Instead, there are multiple profiles leading to the experience of techno-stressors. We see that neuroticism plays a major role in four personality profiles (C1, C2, C4, C6). However, in two of the profiles (C3, C5) neuroticism plays a subordinate role or must even be absent. We see that being neurotic is not the only way towards experiencing techno-stressors. In the open-extraverted and agreeable personality profile (C5), neuroticism even has a negative influence on techno-stressors. Similarly, four of the personality profiles encompass the absence of extraversion (C1, C2, C3, C6). However, in two of the profiles (C4, C5) extraversion does not have any influence at all or can even have a positive influence on techno-stressors. Based on that, we see that there are different profiles of personality traits that lead to the experience of techno-stressors and that they explain techno-stressors to an equivalent extent. It is highlighted that certain personality traits do not necessarily have a positive or negative influence and that it rather depends on the combination of traits if they predispose to techno-stressors.

Practical Contributions. This research contributes to practice as the findings enable the early detection of users who are at risk, even before negative consequences arise. The findings can be used for preventing that employees are stressed by using ICTs. This is relevant based on the fact that techno-stressors negatively affect employees' health and organizational factors [7, 9, 26, 27].

Who might incorporate and contribute from the research findings? First, employees themselves may use the findings for self-insight. They may evaluate themselves based on the depicted profiles of personality traits, which allows them to identify if they are at risk. This self-insight is the first, but very important step to take action for mitigating and preventing techno-stressors. Based on that self-insight, they may e.g. change their ICT work habits, seek support, or engage in stress management practices.

Second, the depicted research findings may sensitize leaders for the risk of techno-stressors. More concretely, the findings highlight that employees differ in their risk of experiencing techno-stressors. There are employees that are especially prone to experience techno-stressors, whereas other employees are not. Thus, leaders should be aware of these differences, which should also be reflected in their leadership behavior. At this point, a scattergun approach might not be helpful. Instead, the findings allow leaders to specifically focus on employees at risk, which might include individual support provision or the provision of stress management interventions for the risk group.

Third, the findings can be used by software designers for the installation of adaptive enterprise systems. In combination with information from a voluntary personality screening, techno-stressors may be prevented specifically for the employees who are at risk by automatic technological adaptations, e.g. temporary interruption of mail servers for a reduction of incoming mails or the application of wizards [50].

Limitations and Further Research. There are some limitations to the results provided in this study, as illustrated in the following. To begin with, we focused on investigating user's personality traits on the most general level in a way that covers most facets of personality (Big Five) to understand which profiles of personality traits predispose to techno-stressors. However, investigating personality profiles of narrower traits, e.g. IT mindfulness [17], also seems reasonable and could be focus of future research as users can change these personality traits to some degree [17]. Moreover, we focused on techno-stressors as an aggregated construct and did not investigate the predisposition to personality profiles for each techno-stressor separately. Here, future research might study whether each techno-stressor is influenced by different profiles. Finally, it was not specifically investigated how demographic or organizational factors like type of organization or participant's role within the organization influence how personality traits predispose to techno-stressors as this was the first approach to gain an understanding of the depicted connection. The Big Five personality traits are stable across situations and time [51, 52]. Thus, they are rather independent from the influence of organizational factors. However, future research could take a look deeper into each of the six personality profiles and their predisposition to techno-stressors to reveal possible differences based on demographic or organizational factors.

6 Conclusion

The invasion of ICTs at work and daily life is constantly growing, and with it techno-stressors and related financial costs as well as negative health consequences. Therefore, knowledge is needed to detect users who are at risk at an early stage. Using a QCA approach, the study identifies six different profiles of personality traits to predispose to techno-stressors. These findings contribute to existing research by highlighting the importance of personality profiles as a predisposition to techno-stressors and the need to investigate personality traits in profiles. Practitioners may use the research findings to intervene and prevent negative consequences arising from techno-stressors.

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