

SURFING, SCROLLING AND STRESSING: TECHNOSTRESS IN BROWSING DIGITAL CONTENT FEEDS ON SMARTPHONES FROM THE GRATIFICATIONS AND DIMENSIONS OF USE PERSPECTIVE

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Abstract: *In this study, we investigate how the nature of activities users perform to interact with information delivered via smartphones (i.e., dimensions of smartphone use), along with gratifications sought and obtained, contribute to technostress in the context of digital content feeds. By applying qualitative research methods and analyzing data gathered through 30 semi-structured interviews, we identify five dimensions of smartphone use: instant, repeated, continuous, personalized, and versatile. Introducing the concept of smartphone use loop, we reveal the dynamic relationships between these dimensions, gratifications, and technostress, illustrating how different dimensions of use and underlying gratifications can lead to diverse technostress experiences (e.g., depending on whether the gratifications sought are obtained). Furthermore, we identify previously unexplored technostressors and strains, such as gratification mismatch and worsened boredom tolerance. By integrating uses and gratifications theory with technostress research, this study offers a novel framework for understanding the dual nature of smartphone use.*

Keywords: *technostress, uses and gratifications theory, dimension of use, smartphone, qualitative research*

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INTRODUCTION

While smartphones have undeniably contributed to positive change in our society by facilitating access to information technology (IT) anywhere and anytime, such has not come without drawbacks. Prior studies have characterized mobile technology as a double-edged sword (Dén-Nagy, 2014; Qi, 2019), with smartphone use at bedtime described as “sleeping with the frenemy” (Hughes & Burke, 2018, p. 236). Additionally, research has linked various forms of IT, including smartphones (e.g., Lee, Chang, Lin & Chen, 2014; Malik, Dhir, Kaur & Johri, 2021) and social media (e.g., Maier, Laumer, Eckhardt & Weitzel, 2015; Maier, Laumer, Weinert & Weitzel, 2015; Salo, Pirkkalainen & Koskelainen, 2019), to technostress, that is, stress caused by IT use (Tarafdar, Cooper & Stich, 2019). It has been shown that technostress can harm users’ well-being (Fischer & Riedl, 2017; Salo et al., 2019), underscoring the importance of studying the phenomenon further.

In the present study, we focus on technostress associated with digital content feeds viewed on smartphones. This focus is motivated by the widespread adoption and ubiquity of smartphones, used by billions globally, and the significant influence digital content feeds have on the information consumed through these devices. These types of feeds have even been associated with a type of flow state in which the users “are so engrossed in an activity that little else seems to matter to them and they will often continue the activity despite its negative consequences” (Roberts & David, 2023, p. 80), making them an interesting context for investigating technostress. Moreover, Gerlach and Cenfetelli (2020) propose that factors like the need to stay up-to-date motivate constant device checking, highlighting the necessity for further research to examine “the costs and benefits” of these behaviors (Gerlach & Cenfetelli, 2020, p. 1722). Therefore, understanding why users engage with digital content feeds on smartphones despite experiencing technostress is a critical area of inquiry.

We define digital content feeds as constantly and dynamically updating information streams from various services, applications, and websites. Notable examples of such feeds are present on social media (e.g., Instagram), instant messaging services (e.g., WhatsApp), and news sites and applications, which all have been associated with technostress (Ardèvol-Abreu, Delponti, Bonache & Rodríguez-Wangüemert, 2023; Salo, Pirkkalainen, Chua & Koskelainen, 2022; Whelan, Islam & Brooks, 2020). Consequently, when we mention smartphone use in our study, we refer to use centered around digital content feeds. Examining the technostress caused by browsing digital content feeds on smartphones and understanding why individuals continue this behavior despite its contribution to technostress is critical from multiple perspectives. It raises important questions: Who finds themselves in technostress-inducing situations, why do they engage in these behaviors, and how do such situations arise? Understanding this is essential for designing services that prioritize users’ well-being and for educating users about the diverse and often problematic consequences of their smartphone-related behaviors.

There is a growing body of knowledge regarding technostress within the personal and leisure contexts. For instance, overdependence (Salo et al., 2019), fear of missing out (FOMO) (Malik et al., 2021; Dhir, Yossatorn, Kaur & Chen, 2019), overload (Cao & Sun, 2018; Fu, Li, Liu, Pirkkalainen & Salo, 2020), invasion (Maier, Laumer, Weinert et al., 2015; Salo et al., 2022), and social comparison (Fox & Moreland, 2015; Salo et al., 2019) have all been identified as *technostressors* (i.e., stress-creating stimuli caused by different situations and events) in

personal IT use. Moreover, prior studies have revealed how IT use for personal purposes may lead to *strains/outcomes* (i.e., psychological, physical, and behavioral reactions to technostressors) such as exhaustion (Cao, Masood, Luqman & Ali, 2018; Cheikh-Ammar, 2020), concentration and sleep problems (Salo et al., 2019), reduced happiness (Brooks, 2015), and use discontinuation (Maier, Laumer, Weinert et al., 2015). Thus, the emergence of technostress through various technostressors and resulting strains/outcomes is well-documented in the literature. However, this process is shaped by numerous factors, including individual characteristics (Lee et al., 2014; Hsiao, 2017), the features of the IT itself (Ayyagari, Grover & Purvis, 2011; Salo et al., 2019; Tugtekin, Barut Tugtekin, Kurt & Demir, 2020), and patterns of usage (Maier, Laumer, Weinert et al., 2015). These influences underscore the dynamic and complex nature of technostress.

Despite existing research, there is limited understanding regarding the positive gratifications users seek (gratifications sought; tightly linked to needs or motives) and obtain (gratifications obtained; satisfying the needs by receiving gratifications) (Quan-Haase & Young, 2010; Palmgreen & Rayburn, 1979) through smartphone use and the impact of technostress as an associated negative outcome. Furthermore, previous studies have not addressed the nature and characteristics of smartphone use in relation to technostress. The uses and gratifications theory posits that individuals actively select media based on the gratifications they seek and obtain (Bae, 2018). Applying this perspective to the study of technostress offers a valuable lens for understanding the active role users play in engaging in behaviors that contribute to technostress. Understanding *why* and *how* individuals use smartphones in situations they experience technostress is crucial for providing answers and solutions for reducing the adverse consequences, such as negative well-being outcomes.

Our exploration of different dimensions of smartphone use (which reflect how individuals use smartphones; what is characteristic of the use) and gratifications (which reflect why individuals use smartphones; what individuals seek and obtain from the use) sheds light on the complex dynamic of the positive and negative facets of smartphone use in the personal context. The concept “dimension of smartphone use”, which we define as *the nature of activities performed by users to interact with information delivered via smartphones*, helps us discern the associations between gratifications sought and obtained, and technostress. Building on these insights, we address two key research gaps: (1) the lack of exploration into what users seek and obtain from smartphone use in the context of technostress, and (2) the absence of explicit discussion on the dimensions of smartphone use and their relationship to technostress. Here, we answer the following research question: *How do the dimensions of smartphone use, the gratifications sought and obtained, and technostress interplay in the personal use context focusing on digital content feeds?* We address this question by applying a qualitative research approach and analyzing data from in-depth interviews with 30 smartphone users.

We contribute to the research in three ways. First, we adopt a dual perspective on gratifications for technostress research following Palmgreen and Rayburn (1979), which involves both the gratifications sought and obtained. We illuminate the complex interplay between users’ underlying motives, cognitions, behavior, and their actual experiences associated with technostress. By integrating insights from uses and gratifications theory and technostress research, we provide a comprehensive exploration of how personal engagement with digital content feeds on smartphones can contribute to technostress. In doing so, we expand the discourse on balancing IT use in personal contexts (Steelman & Soror, 2017).

Second, we treat uses and gratifications as separate constructs and introduce the concept of smartphone use loop, which illustrates the dynamic interplay between gratifications sought, dimensions of smartphone use, and gratifications obtained in relation to technostress. We propose an explicit categorization for the dimensions of smartphone use comprising five dimensions: instant, repeated, continuous, personalized, and versatile. This classification extends beyond previous research grounded in uses and gratifications theory, offering a more nuanced understanding of smartphone use and its relationship with technostress. Third, we identify unexplored technostressors (techno-procrastination, online information bubbles, gratification mismatch) and strains/outcomes (worsened boredom tolerance) arising from the interplay of dimensions of smartphone use and gratifications sought and obtained.

The remainder of the paper is structured as follows. In the next section, we introduce the theoretical background of our study. Subsequently, we discuss the applied research methods and present our results. We then discuss how our findings extend the understanding of the research topic as well as how practitioners could benefit from the results. We also address the limitations of the study and offer directions for future research.

THEORETICAL BACKGROUND

Technostress

Stress occurs when individuals encounter stressors, which are stress-creating stimuli caused by different situations and events that result in strains and other outcomes, which are psychological, physical, and behavioral reactions to stressors (Cooper, Dewe & O'Driscoll, 2001; Lazarus & Folkman, 1984). Overall, stress can be viewed as a dynamic transactional process, where stress represents an interaction between the individual and the environment that the individual appraises as potentially harmful (Lazarus, 1966; Lazarus & Folkman, 1984). While stress is often associated with highly uncomfortable situations and events, even smaller daily stressors—especially when encountered perpetually—can prove detrimental (Charles, Piazza, Mogle, Sliwinski & Almeida, 2013). In the present study, we focus on stress caused by IT use, known as technostress (Tarafdar et al., 2019). Although stress is typically viewed negatively (distress), we emphasize that it can also have positive manifestations (eustress) (Cavanaugh, Boswell, Roehling & Boudreau, 2000). For instance, the holistic technostress model incorporates sub-processes for both techno-distress and techno-eustress, explaining their emergence through distinct types of technostressors: hindrance-stressors and challenge-stressors, respectively (Califf, Sarker & Sarker, 2020). Moreover, Tarafdar, Stich, Maier, and Laumer (2024) further outline four techno-eustress creators: techno-mastery, techno-autonomy, techno-relatedness, and techno-enrichment.

The term technostress was coined in the 1980s in organizational context (Brod, 1982), and the phenomenon has established itself as a central concept for understanding “the dark side of IT” (Tarafdar, Tu, Ragu-Nathan & Ragu-Nathan, 2011). Technostress emergence can be explained through use practices, IT environmental conditions, and the above-mentioned technostressors and strains/outcomes (Ayyagari et al., 2011; Nastjuk, Trang, Grummeck-Braamt, Adam & Tarafdar, 2024; Salo et al., 2022; Tarafdar et al., 2019). Fundamentally, technostress arises when individuals interact with IT and perceive certain IT environmental

conditions (i.e., IT characteristics such as ubiquity) as demands or threats (technostressors) that exceed their abilities to cope, resulting in different kinds of (negative) outcomes or strains (Tarafdar et al., 2019). Especially technostressors and strains have received scrutiny in previous research. In the organizational context, well-established technostressors include techno-overload, techno-invasion, techno-complexity, techno-insecurity, and techno-uncertainty (Fischer & Riedl, 2017; Ragu-Nathan, Tarafdar, Ragu-Nathan & Tu, 2008; Tarafdar, Tu, Ragu-Nathan & Ragu-Nathan, 2007). Previous studies have demonstrated that such stressors may negatively impact the benefits organizations can derive from IT due to reduced productivity and efficiency (Hung, Chen & Lin, 2015; Pirkkalainen, Salo, Tarafdar & Makkonen, 2019; Tarafdar et al., 2007). Moreover, such experiences of technostress can provoke deviant behaviors among employees, which may result in significant costs for organizations (Chiu, Tan, Hsu, & Cheng, 2023). Despite the above-mentioned five technostressors having roots in organizational research, studies concerning personal IT use have adapted them as well (Tarafdar, Maier, Laumer & Weitzel, 2020).

As IT use differs in organizational and personal/leisure contexts due to the voluntariness of use, studies have identified technostressors especially characteristic in personal IT use context. There does not exist a similar, widely accepted inventory of technostressors for the personal contexts as for the organizational. However, Nastjuk et al. (2024) proposed a list of six such technostressors based on prior research (Maier, Laumer, Weinert et al., 2015; Tarafdar et al., 2020): pattern, disclosure, complexity, invasion, uncertainty, and social overload. Other prevalent technostressors identified for personal contexts include overdependence (Salo et al., 2019), FOMO (Dhir et al., 2018; Malik et al., 2021), and social comparison (Fox & Moreland, 2015; Salo et al., 2019). Studies also have associated phenomena such as compulsive use (Dhir et al., 2018), excessive use (Luqman, Cao, Ali & Masood, 2017), and addiction (Tarafdar et al., 2020) with technostress in the context. The strains/outcomes identified in the personal technostress research include exhaustion (Cao et al., 2018; Cheikh-Ammar, 2020), concentration, social relation, and sleep problems (Salo et al., 2019), and reduced happiness (Brooks, 2015). In addition to technostressors and strains/outcomes, elements such as IT (e.g., push notification and self-disclose features) (Salo et al., 2019) and usage characteristics (extent of social media usage, number of social media friends) (Maier, Laumer, Eckhardt et al., 2015), and use practices (Salo et al., 2022) have been discussed in the personal use context of technostress. Especially social media as a specific use context has received attention in previous personal IT use technostress research (e.g., Maier, Laumer, Eckhardt et al., 2015; Salo et al., 2019). In such a context, it has been shown that, for instance, not obtaining the gratifications sought may contribute to fatigue from using social media, which could be stressful (Ravindran, Yeow Kuan & Hoe Lian, 2014). However, previous studies have yet to explore various gratifications sought and obtained and their interplay with technostress in detail, which we do in the context of personal smartphone use in the present study.

Focusing on personal smartphone use, especially compulsive (Hsiao, Shu & Huang, 2017; Lee et al., 2014) and excessive use (Cao et al., 2018; Luqman, Masood, Shahzad, Shahbaz & Feng, 2021) have been associated with technostress. The prevailing approach has been that technostressors (such as overload) lead to strains (such as fatigue) or other outcomes (such as discontinued use) (e.g., Sun & Lee, 2022). Some studies have also examined the impact of personality traits (e.g., Hsiao, 2017; Lee et al., 2014) or IT characteristics (Tugtekin et al., 2020) on the process. Beyond these examples, however, studies on smartphones remain limited

in addressing other factors that influence the emergence of technostress. Given that (techno)stress is a dynamic and transactional process, it is essential to investigate individuals' behavior and underlying cognitions to better understand how technostress arises. To this end, we expand the current knowledge by examining the “hows” and “whys” of personal smartphone use in relation to the dynamics of technostress. This approach broadens the focus beyond technostressors and strains/outcomes to encompass individuals' interactions with IT environments. In the following section, we discuss why and how individuals use IT, establishing the uses and gratifications theory as our theoretical lens to understand user cognitions and behaviors associated with technostress.

Uses and Gratifications

The uses and gratifications theory, originating from communication research during the 1940s, explains why and how people consume media (Ruggiero, 2000). The theory posits that users have needs they wish to satisfy and, therefore, make active media-related choices to receive gratifications (Katz, Blumler & Gurevitch, 1974). More recently, the theory has been applied to explain the use of modern media and IT (Sundar & Limperos, 2013), including the Internet (LaRose & Eastin, 2004; Stafford, Stafford & Schkade, 2004), social media (Bae, 2018; Ku, Chen & Zhang, 2013; Yang, Xu, Land, Yang & Chesney, 2024), and smartphones (Gentina & Rowe, 2020; Joo & Sang, 2013). The choice of uses and gratifications theory as a lens for observing the phenomena of interest in this study was driven by one of the strengths of the theory, its flexibility, since it does not rely on fixed variables (Lin, 1996; Mäntymäki & Riemer, 2014). Moreover, existing research has demonstrated the applicability of uses and gratifications theory in exploring the nuances of technostress, particularly from the perspective of user cognitions underlying IT use and their relationship to experienced technostress (e.g., Ardèvol-Abreu et al., 2023; Baabdullah et al., 2022). These studies provide valuable insights into the underlying factors of the phenomenon. Interestingly, despite experiencing stress, individuals may persist in using stress-inducing technologies in their personal lives (Cheikh-Ammar, 2020), potentially driven by the gratifications they derive from such use (Chaouali, 2016). Consequently, we find that this theoretical framework aligns well with our research objectives.

The issue of why media or IT is used can be discussed by dividing the gratifications into gratifications sought and gratifications obtained. More specifically, gratifications sought can be seen as the driving forces (closely related to needs or motives) behind media use, while gratifications obtained can be seen as the desired outcomes of the use (Palmgreen & Rayburn, 1979; Quan-Haase & Young, 2010). If the gratifications sought and obtained are aligned, individuals are likely to continuously engage with the source of those gratifications (Krasnova, Veltri, Eling & Buxmann, 2017; Rokito, Choi, Taylor & Bazarova, 2019). By contrast, if a discrepancy exists between the gratifications sought and obtained, people may be unsatisfied, reducing their use (Bae, 2018). Even though some studies have shown the importance of both the gratifications sought and obtained, such an approach has received less attention (Bae, 2018; Palmgreen & Rayburn, 1979).

In addition to gratifications sought and obtained, gratifications can be categorized according to what people specifically seek and obtain from media and IT use. An example of such categorization is a three-way categorization of hedonic (related to enjoyment or pleasure), utilitarian (related to usefulness), and social (related to social interaction) gratifications (e.g.,

Li, Liu, Xu & Heikkilä, 2015; Mäntymäki & Riemer, 2014). Focusing on smartphones, prior studies have shown how their use is associated with, for instance, entertainment (hedonic) (Ha, Kim, Libaque-Saenz, Chang & Park, 2015), communication (social) (Gentina & Rowe, 2020), and information-seeking (utilitarian) (Joo & Sang, 2013) gratifications.

In previous uses and gratifications studies, use has been discussed with different terms and emphases in various contexts. Traditionally, use has been characterized as either ritualistic or instrumental (Rubin, 1984). Furthermore, drawing on gratifications, different types of use, such as information-seeking and entertainment use (van Deursen & van Dijk, 2014), have been established. As we discuss dimensions of use in the present study, we note that the term has been used in previous research. The term has been used to describe specific types of uses, namely the information dimension (e.g., to learn about events), friendship dimension (e.g., to keep in touch with friends), and connection dimension (e.g., for dating purposes) (Bonds-Raacke & Raacke, 2010). In the context of smartphones, process and social dimensions of smartphone use have been identified (Elhai, Levine, Dvorak & Hall, 2017). Beyond uses and gratifications research, the term “dimensions of use” has been applied to describe various aspects of Internet use, including the amount (how much users engage), variety (how many different activities users undertake), and types (the kinds of activities users participate in) (Blank & Groselj, 2014). Similar approaches have employed the term “usage characteristics” to capture factors such as relationship length and usage experience (Kim, Wong, Chang & Park, 2016), as well as the extent of social media use and the number of social media connections (Maier, Laumer, Eckhardt et al., 2015).

We address use and gratifications as separate yet interconnected concepts and, therefore, consider that the types of uses (van Deursen & van Dijk, 2014) and dimensions of use that focus on specific types of uses (Bonds-Raacke & Raacke, 2010) are not adequate typologies for the study. We approach use from a different level of abstraction, focusing on what characterizes the use, examining its underlying nature. Approaching use this way, previous studies have mentioned, for example, constant use (Duke & Montag, 2017; Gerlach & Cenfetelli, 2020; Salo et al., 2022), although there does not appear to exist a holistic categorization for such dimensions of smartphone use. Also, although the uses and gratifications theory has been previously applied in studies discussing the negative consequences of IT use (Baabdullah et al, 2022; Chaouali, 2016; Gentina & Rowe, 2020; Sun, Liu & Zhang, 2020), exploring both the gratifications sought and obtained in relation to technostress is scarce. Furthermore, prior studies have not explained the nature of IT use in relation to gratifications and technostress. Our concept of dimensions of smartphone use gives insight into the interplay of gratifications sought and obtained and their relation to technostress. By drawing on the established technostress and uses and gratifications literature, we identify different dimensions of smartphone use and link them to gratifications and technostress with our empirical study as follows.

RESEARCH METHODS

Data Collection

We adopted a qualitative research approach in this study, given its suitability for examining how individuals engage with their technological environments (Myers, 1997). To collect data,

the first author interviewed (semi-structured interviews) 30 individuals (11 men and 19 women). Ten interviews (nine face-to-face and one remote) were done in 2019, while 20 remote interviews were conducted in 2021. The interview durations ranged from 34 to 77 minutes (average: 54 minutes). To identify interviewees, we applied a purposeful sampling method by seeking “information-rich cases for in-depth study” (Patton, 2002, p. 230), with the help of snowballing. In essence, the goal was to identify interviewees who were active smartphone users and had experienced technostress. This was accomplished by explicitly outlining these criteria in our research call. While the initial goal was to recruit young adults, who are traditionally active users of smartphones, we ultimately prioritized identifying individuals who used smartphones and had experienced technostress, irrespective of things such as their smartphone use patterns or age. By doing this, we were able to recruit a sample that represented “a variety of voices” (Myers & Newman, 2007, p. 22). Such an approach was deemed important for our goal of providing deep insights into the phenomena of interest, rather than providing results that could be generalized.

The interviewees were between 22 and 41 years old (average: 27 years), and they were all native Finnish speakers living in Finland. All interviewees were students, employed, or a combination of the two. The professions of the employed interviewees were diverse (e.g., pharmacist, human resources specialist, firefighter, masseuse, and early childhood educator). Regarding their smartphone use, the most used applications were Instagram (a social media platform) and WhatsApp (an instant messaging service). In addition, interviewees mentioned using other social media, including Facebook, Snapchat, TikTok, and Reddit. Moreover, many interviewees reported using their smartphones to access various news sources, including tabloid news, local media, and news related to specific topics like the economy. The time the interviewees spent using a smartphone ranged from under an hour up to nine hours a day, with the average time being around five hours. The individuals in our sample exhibited both similarities and differences in their psychosocial development, history of IT use, and current smartphone-related behaviors, allowing us to gather data that was both rich and consistent.

The interview method offers both strengths, such as the potential to gather rich, detailed data, and weaknesses, including the artificial nature of the interview setting (Myers & Newman, 2007). This artificiality may have led participants to provide socially desirable responses rather than fully authentic accounts of their experiences. Such responses might also stem from a lack of trust between the interviewer and the interviewee (Myers & Newman, 2007). To address these challenges, the interviewer adopted a neutral and natural demeanor, allowing the interaction to unfold organically and giving participants space to articulate their experiences and emotions in their own words (Myers & Newman, 2007). Techniques such as mirroring were employed to facilitate deeper discussions and encourage participants to elaborate on their experiences (Myers & Newman, 2007). Additionally, the interviewer demonstrated familiarity with the specialized jargon related to the IT context under study—specifically, various types of digital content feeds used on smartphones—helping to minimize social dissonance and foster a more open dialogue.

All the interviews focused on two main themes, namely why and how the interviewees used their smartphones (gratifications sought and obtained; dimensions of use) and what kinds of stressful or negative consequences they had experienced as a result (technostressors and the ensuing outcomes). Thus, the interview framework was partly based on existing research. In terms of their smartphone use, the interviewees were asked, for example, what digital content

feeds they browsed on their smartphones, why and how they browsed the content, and what they thought they received from the use. Regarding the stressful or negative consequences of smartphone use, the interviewees were asked, for example, what kinds of stressful or negative experiences they had had while using smartphones, what types of use they engaged in during experiencing such, and what consequences such experiences had caused for them. Despite us following a framework during our interviews, we were “prepared to explore interesting lines of research, and look for surprises”, as is the nature of semi-structured interviews (Myers & Newman, 2007, p. 17). After conducting 30 deep and narrative-rich interviews, we determined that sufficient saturation had been reached as our preliminary analysis of the data indicated that the emergence of new insights from additional interviews regarding our research problem had significantly diminished at this stage. This meant that similar patterns of technostress experiences and their underlying conditions were highly repetitive in the participants stories. Figure 1 describes the different steps conducted during our data collection and analysis phases.

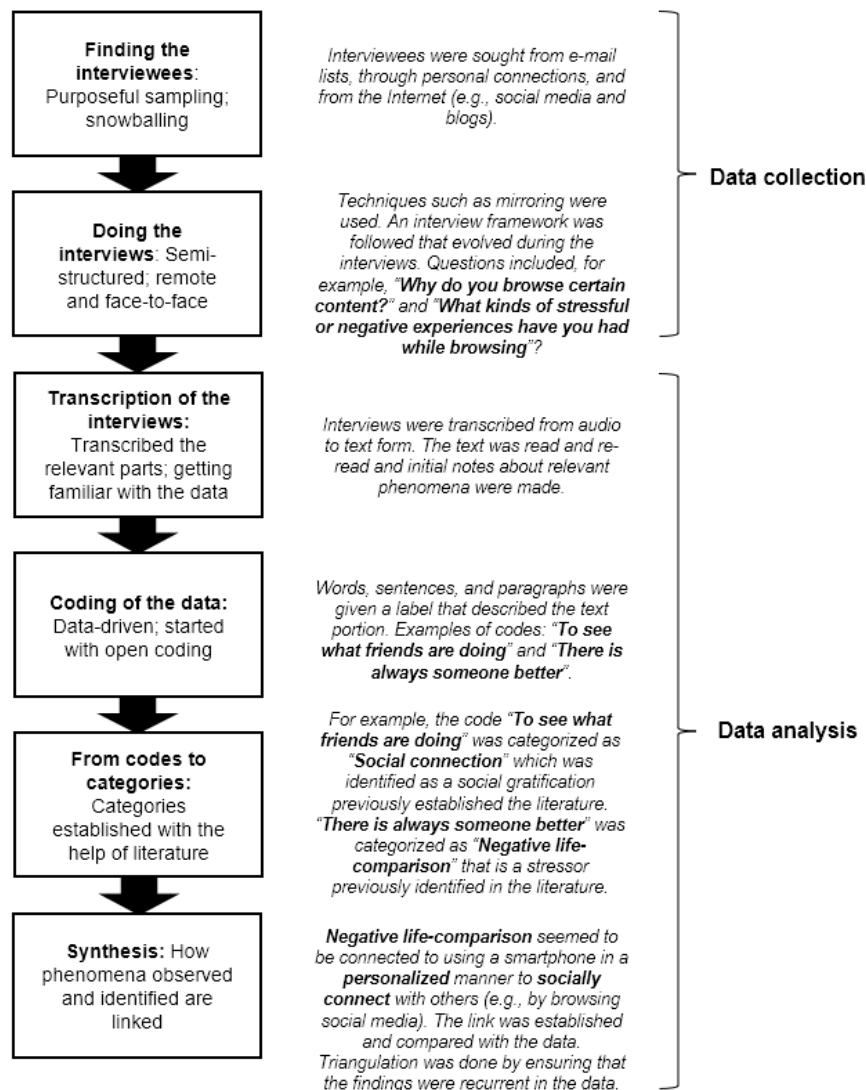


Figure 1. Data Collection and Data Analysis.

Data Analysis

As a first step, the interviews were transcribed, during which the first author made initial notes concerning the data. Subsequently, the first author read and re-read the transcriptions and made further notes about relevant observations. After the first author had become sufficiently familiar with the data, they began to code it following established guidelines (Lune & Berg, 2017; Saldaña, 2013). Although the first author conducted the primary analysis, they collaborated with the co-authors to discuss aspects such as the codes, emerging categories, and their relationships. The data was analyzed iteratively, beginning with open coding using NVivo software. During this process, we could dive deep into the data and become more familiar with them (Saldaña, 2013). This phase “allows researchers to identify and even extract themes, topics or issues in a systematic manner” (Lune & Berg, 2017, p. 125). Reflecting on the research question, all relevant pieces of data were labeled. Subsequently, the codes were initially assigned to three groups: 1) why the interviewees used their smartphones, 2) what kinds of stressful or negative events and situations they had encountered due to the use, and 3) what kinds of (negative) consequences had stemmed from the use. During this phase, we observed that in addition to understanding why people used smartphones, how they used them emerged as essential for understanding their behavior and experiences. Thus, we also assigned the codes to a fourth group: 4) how the interviewees used their smartphones. As the final task during this phase, irrelevant initial codes were removed.

While our analysis was heavily data-driven, during the coding process we harnessed theoretical insights from technostress and uses and gratifications literature to guide our coding. This meant looking for content in the participants’ words that resonated with concepts central to the literature streams (e.g., specific types of technostressors such as *overload* and gratifications such as *entertainment*). Such central concepts were used for categorizing the codes when we started combining the codes, creating categories based on them (Saldaña, 2013). For example, the codes *too much content to browse* and *an overflow of information* were categorized under *information overload* (later re-named as *online information overload*). In line with prior studies, we identified online information overload as a technostressor (this is an example; other technostressors were also identified). Therefore, we harnessed existing research to deepen our understanding of the data (Saldaña, 2013). Based on our data, we observed three technostressors that previous studies had not identified: techno-procrastination, online information bubbles, and gratification mismatch. Moreover, as we wanted to understand how individuals used their smartphones, we examined the codes relating to that, which resulted in, for example, the codes *immediately reads messages* and *instantly grabs the phone during downtime*, which were categorized under the *instant dimension of use*. This approach was applied to other concepts as well. For example, the codes *one can shut off the brain* and *one can take a breather* were consolidated under the category *relaxation*, which was identified as a hedonic gratification. Similar actions were performed for the other dimensions of use, gratifications sought and obtained, and strains/other outcomes. We categorized the codes iteratively and compared the new categories with the original codes and the data to ensure that the categories were loyal to the data (Lune & Berg, 2017; Saldaña, 2013).

Next, the first author re-read the whole data set, reflecting the created codes and categories with the data, ensuring that the codes and categories created could capture the essence of what the interviewees said. During this phase, the data, codes, and categories were constantly

compared, and if needed, the codes and categories were reorganized or removed (Saldaña, 2013). As our goal was to explain how different concepts are linked, we searched for patterns within the data (Lune & Berg, 2017). We analyzed how specific ways (dimensions of use) and reasons (gratifications) associated with smartphone use were present in certain negative situations (technostress) and vice versa. For example, the interviewees could tell that they were seeking entertainment and, therefore, browsed their smartphones continuously, due to which they neglected other tasks. This was also done in the other direction. The interviewees could tell that they experienced exhaustion due to the constant flow of messages (information overload) from different services. By examining the data, such situations could be pinned down to, for example, versatile use performed to obtain social gratifications. To understand the phenomenon holistically, the authors together analyzed the relationships between the different categories and based on the resultant observations and discussions, created a model to explain the emergence of technostress in the context. The findings identified as central were those corroborated by multiple participants, thereby enhancing the validity and reliability of the conclusions through triangulation (Lune & Berg, 2017). Additionally, the robustness of these findings was further reinforced by employing constant comparison, which involved iterative analysis of the data, codes, and categories. This process allowed for the refinement, reorganization, or elimination of codes as necessary to ensure they accurately reflected the essence of the participants' responses (Saldaña, 2013). Moreover, this enhanced the consistency of our coding and analysis, further increasing the validity and reliability.

Next, we will present our observations on smartphone use and the associated gratifications. Following this, we will explore the interplay between the dimensions of smartphone use, the gratifications sought and obtained, and the experience of technostress. We provide brief information about the frequency of observations where relevant (e.g., how many participants mentioned a particular technostressor). However, we emphasize that these numbers are presented solely as background information and should not be used to draw generalized conclusions.

RESULTS

Smartphone Use Loop

As we were analyzing different dimensions of smartphone use and gratifications sought and obtained in our data, we observed them forming a cycle: *the smartphone use loop*. This loop illustrates how gratifications sought, dimensions of smartphone use, and gratifications obtained are associated, with the gratifications sought serving as the trigger that initiates smartphone use, followed by the dimensions of use, leading to the gratifications (not) obtained (visualized in Figure 2). In the following sections, we discuss the smartphone use loop in more detail. We will begin by discussing gratifications sought and obtained, as gratifications sought act as the trigger that initiates smartphone use. Subsequently, we elaborate on the different dimensions of smartphone use. Finally, we will illustrate how the smartphone use loop can be employed to explain the emergence of technostress, extending existing research on the antecedents of technostress.

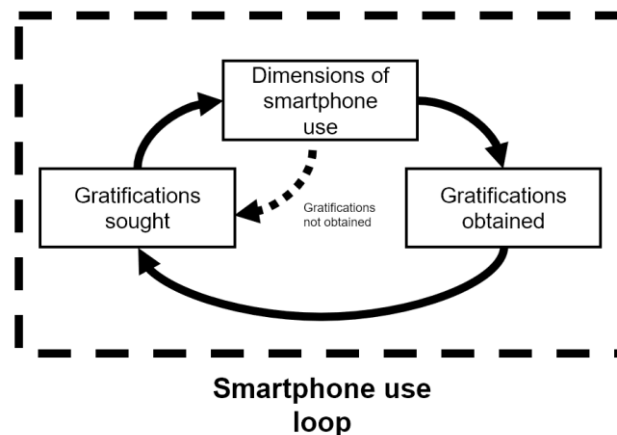


Figure 2. Smartphone Use Loop.

Gratifications Sought and Obtained

Previous studies have suggested that media users may not always obtain the gratifications they seek (Palmgreen, Wenner & Rayburn, 1980; Rokito et al., 2019). Therefore, we provide insights from both scenarios. We divide gratifications into three main categories: hedonic, social, and utilitarian. While all 30 interviewees sought and obtained gratifications across these main categories, differences were observed in terms of more specific gratifications.

Hedonic gratifications. The most prevalent hedonic gratifications sought and obtained among the interviewees concerned entertainment. Moreover, they pursued gratifications like escapism, relaxation, novelty, humor, passing time, comfort, and inspiration. Entertainment was especially sought in situations the interviewees considered boring, and social media platforms like Instagram and TikTok were frequently used for this purpose. Many highlighted that visual content, such as pictures and videos, were the primary sources of hedonic gratifications, and such gratifications were often sought by continuously browsing different kinds of feeds. In cases where escapism was sought, users tended to access their smartphones repeatedly, checking various social media feeds for novel content. Many interviewees thought smartphone use could initially bring hedonic gratification, although after continuous sessions or repeated browsing, the gratifications were no longer perceived as obtained. Overall, we found that hedonic gratifications were the most frequent types of gratifications associated with situations leading to technostress. Nevertheless, hedonic gratifications were frequently pursued through browsing various digital content feeds. As one participant described their experience of reading comments on a social media platform:

And it's fun, and you find those highlights there, like everyone's always trying to be so funny, but you also come across things that are genuinely funny. So, it's nice and entertaining. [...] It's like entertainment, and specifically in a fun way.

Social gratifications. The most prevalent social gratifications sought and obtained among the interviewees concerned social connection. Moreover, they pursued gratifications like affection, staying up to date with their friends and relatives (by instant messaging or through following them on social media), and other elements of sociality, including peer support. In our interviews, different aspects of sociality were the most common reasons for smartphone

use. Many interviewees mentioned that their close ones lived elsewhere, and staying in touch with them was a primary motivation for smartphone use. Some highlighted active communication, while others emphasized the ability to observe what people were doing. Instant messaging (mainly WhatsApp) was primarily used for social gratifications, although some interviewees used social media like Instagram and Facebook for this purpose. Overall, the ability to send and receive messages instantly was highly valued, often leading to instant and repeated checking of smartphones. Additionally, smartphones offer a versatile means of managing different social environments, and many interviewees used various social media and instant messaging services for different people or social situations, allowing them to tailor their interactions accordingly. In general, the interviewees reported that they were successful in obtaining the social gratifications they sought. However, there were instances where the gratifications sought were not obtained, such as when they were waiting for a message but not receiving it. For the majority of participants, social gratifications emerged as the most significant drivers of their smartphone use:

Yeah, the social aspect, like staying in touch with people, that's definitely the most important thing. It's really the only reason why I even pick it up. It's the social side... Okay, sometimes it's for a Google search or something like that, or listening to music or something else, but like, 90 percent of the time, it's about that social connection. Or seeking it there. I'm quite a people-oriented person, so even though I spend a lot of time alone in my daily life, in a way I'm not, because through the phone, I'm still connected to people.

Utilitarian gratifications. The most prevalent utilitarian gratifications sought and obtained among the interviewees concerned staying up to date. Additionally, other information-related gratifications were mentioned. Often, the interviewees actively pursued information on specific topics, but they also passively absorbed information while browsing news and social media feeds for various purposes. Many interviewees turned to different news sources to enhance their understanding of global and national events, reflecting their desire to stay up to date. Moreover, social media was commonly used to gather information on various topics, often accomplished through personalized browsing. In general, the interviewees reported that they were usually successful in obtaining the utilitarian gratifications they sought, although personalized use sometimes hindered this by limiting exposure to a broader range of information. Even though the utilitarian gratifications sometimes played a role in prompting the browsing of digital content feeds, their role was not as influential as that of the hedonic and social gratifications in our data. Still, especially utilitarian gratifications linked to staying up to date were often mentioned, as one participant explained on browsing news sites:

Mainly, I still want to browse them because I know they provide at least some good information. And then again, even for my work, it's important to stay updated on things like economic events. So, in a way, I don't see it as negative or a waste of time; for me, it's just a given that I stay informed about those things every day.

It is important to note that all the main gratifications discussed can be sought or obtained simultaneously. For instance, some social media platforms are used for entertainment, communication, and information-seeking purposes, making them relevant to all the gratifications discussed. Indeed, by communicating with others (seeking social gratifications), users might simultaneously obtain both hedonic (enjoyable conversation) and utilitarian (useful

information exchange) gratifications. Next, we discuss the different dimensions of smartphone use that were prevalent in our data in more detail.

Dimensions of Smartphone Use

From our data, we identified five dimensions of smartphone use. The dimensions of use provide insights into how smartphones are used; what is characteristic of the use, addressing both temporal (instant, repeated, and continuous) and content (personalized and versatile) characteristics. Thus, the dimensions do not focus on specific activities or tasks performed on the device.

Instant. This dimension refers to situations in which users instantaneously initiate smartphone use by reacting to various stimuli, such as receiving a smartphone notification, or situational cues, like watching TV and encountering commercials. Therefore, instant use can be triggered by either smartphone-related events or real-life occurrences. Within the instant dimension of use, only a single use instance takes place. For example, users might read a message they receive on their smartphones immediately after receiving it or instantly engage with their smartphones when the current activity lacks stimuli. The gratifications sought are especially relevant in explaining the initiation of instant use. One interviewee provided an example of using their smartphone while eating or waiting in queues:

Like when you're eating, you feel like you need your phone there, or standing in a queue at the store. I mean really brief moments, it doesn't have to be very long, that moment of boredom or pause, for you to take up the phone.

Repeated. This dimension refers to situations in which users repeatedly use their smartphones, such as frequently checking their devices to browse social media or to see if they have received any messages. Within the repeated dimension of use, multiple instances of use take place, and repeated use can reflect multiple instances of instant use. Both the gratifications sought and obtained play a central role in repeated use. Gratifications sought initiate the use, and when the gratifications are obtained, users may seek to experience them again, leading to repetitive actions. The same can occur if users do not obtain the desired gratifications because they may repeat their efforts to attain the gratifications they originally sought. The interviewees often engaged in repeated smartphone use in situations they found otherwise uncomfortable. For instance, interviewees mentioned their tendency to repeatedly access smartphones while trying to study:

But sometimes, you kind of wake up to the fact that you repeatedly pick up your phone and open, say, a messaging app or Reddit several times, and you're like scrolling through it for, say, five minutes, then you put it down and then pick it up again, put it down, pick it up again.

Continuous. This dimension refers to situations in which users browse their smartphones continuously over an extended period. In continuous use, a single or multiple use instances can occur, meaning that both the instant and repeated dimensions can eventually transition into continuous use. This may happen, for example, when a user receives a message, immediately reads it, and then continues using the phone. Continuous use is particularly characteristic when browsing social media, as these platforms typically feature feeds containing an endless stream of content (such as TikTok), allowing users to browse without reaching a natural stopping

point. In continuous use, the gratifications obtained are crucial in maintaining engagement. As one interviewee mentioned about TikTok and the novel content it constantly displays:

Like, if I sit down on the couch and decide, “okay, I’ll open TikTok and watch a couple of videos, just for a moment.” But because it’s so easy to use, and there’s always new videos coming up, then suddenly I realize how easily I can get stuck there for half an hour.

Personalized. This dimension refers to situations in which users engage with digital content feeds that are personalized by the service to appeal to individual users. Differing from instant, repeated, and continuous dimensions, the personalized dimension does not address the temporality of use. An example of personalized use is when users browse social media feeds that feature content personalized by the service to align with the presumed interests of the user. In personalized use, the gratifications sought and obtained are often aligned, at least initially, as such use is supposed to be consistent with what the users are interested in. However, due to personalization, users may not always see everything they truly want. Nonetheless, personalized use in services such as TikTok was often found to be entertaining, as one interviewee noted:

I initially thought, “this isn’t for me” [TikTok]. But for some reason, I wanted to explore it further, and I started responding to those videos, by clicking “I don’t like this, and I don’t like that” on some, so it started customizing the front page based on that. And then I realized, “Okay, there are actually some funny videos here,” and I realized I was using it every day.

Versatile. This dimension refers to situations in which users engage with more than one digital content feed. Differing from instant, repeated, and continuous dimensions, the versatile dimension does not address the temporality of use. In versatile use, the gratifications sought are particularly important. Given that individual feeds or functionalities within feeds may not be capable of fulfilling all the gratifications users seek, versatile use becomes necessary. One interviewee elaborated on this in the context of reading news:

If I read, for example, [a magazine focused on the economy], I expect to get relevant information and news from there. And then with [a tabloid magazine], it’s more like general, light news about what’s happening in Finland, but it’s not always purely informative; it has more entertainment value. But then, for example, I follow [a local newspaper] because it’s a media outlet from [a county], and I live in [a city], so I still kind of keep up with news from my hometown.

It is important to note that different dimensions of smartphone use can coexist and interact with each other. An example of this interaction occurs when users continuously browse personalized social media feeds, and this continuous use can lead to even more personalized information, reinforcing the personalized use dimension. Nevertheless, specific dimensions tend to be more prevalent in some situations. Even more importantly, depending on the situation, specific dimensions of use, associated with different gratifications sought and obtained, play a crucial role in the emergence of technostress, which we will elaborate on in the following sections.

Interplay Among Technostress, Gratifications Sought and Obtained, and Dimensions of Use

In this section, we explain the interplay between technostress, gratifications sought and obtained, and the dimensions of smartphone use (as illustrated in Figure 3). Our observations reveal that the gratifications sought initiate the process, followed by engagement within a specific dimension of smartphone use. Depending on various situational factors, smartphone use may lead to the gratifications obtained or not obtained. However, it is crucial to note that technostress can emerge in both scenarios. Following Figure 3, we explore the two distinct routes that illustrate the associations between technostress and the smartphone use loop. In Table 1, we have summarized central situations that follow the model. Moreover, Table 2 presents an example chain of evidence of our results.

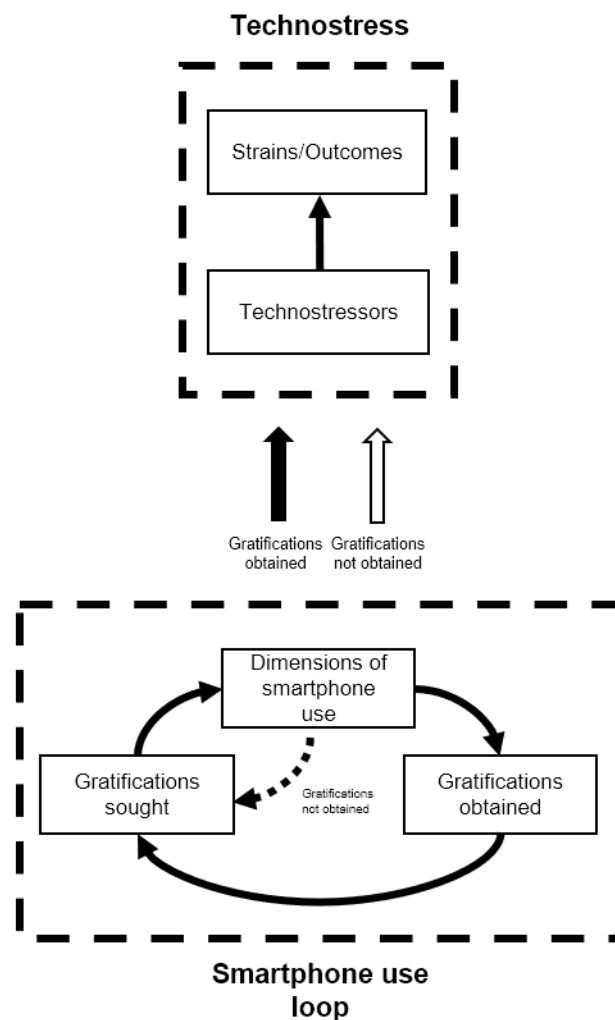


Figure 3. Smartphone Use Loop and Technostress.

Note. The gratifications sought, dimensions of smartphone use, and the gratifications obtained may interact without leading to technostress—the figure illustrates how the smartphone use loop can underlie situations in which technostress emerges.

Table 1. Central Situations of the Interplay Among Technostress, Gratifications Sought and Obtained, and Dimensions of Use.

	Situation 1	Situation 2	Situation 3	Situation 4	Situation 5
Dimensions of Smartphone Use	Instant	Repeated	Continuous	Personalized	Versatile
Central Gratifications	Hedonic gratifications sought and obtained	Hedonic gratifications sought and obtained	Hedonic gratifications sought (but not) obtained	Utilitarian/ social gratifications sought but not obtained	Social gratifications sought but not obtained
Central Technostressors	Interruptions; techno-invasion	<i>Techno-procrastination</i> ; online information overload	<i>Gratification mismatch</i> ; techno-dependency	<i>Online information bubbles</i> ; negative life comparison	Online information overload; fear of missing out
Central Strains/Outcomes	<i>Worsened boredom tolerance</i> ; frustration; annoyance; fatigue	Anxiety; exhaustion	Guilt; sleep problems	Fear; inadequacy	Exhaustion; anxiety
Situation Description	Despite obtaining gratifications related to, for example, passing time, instant smartphone use leads to interruptions and eventually, worsened boredom tolerance (e.g., due to being so used to instant gratification).	Despite obtaining gratifications related to, for example, escapism, the individual's repeated smartphone use leads to techno-procrastination and anxiety (e.g., due to not progressing important tasks).	Despite initially obtaining gratifications related to, for example, entertainment, continuous smartphone use eventually is not gratifying, leading to gratification mismatch and guilt (e.g., due to spending time on something that is not gratifying or important).	Due to personalized use, one encounters online information bubbles and is unable to see different perspectives for information, which can increase fear (e.g., of polarization).	Due to versatile use, one encounters online information overload, which can lead to exhaustion (e.g., due to too much information coming in from different social media platforms and instant messaging services).

Note. Technostressors and strains in italics are new findings.

Table 2. An Example Chain of Evidence: Situation 1.

Interviewee	Dimension of Smartphone Use	Central Gratifications	Central Technostressors	Central Strains/Outcomes
A woman in her 30s, holding a Master's degree, and working full-time.	"I do notice that if the phone is right there next to me, I'll pick it up without even really realizing it. Before I know it, I've grabbed it, opened it, and started scrolling through something."	"It's so easy to check it during a commercial break or even in the middle of a show, and without even thinking about it, you might just grab the phone and start using it." (hedonic gratification sought and obtained – passing time)	"And actually, just this spring I realized that I was getting every possible news notification on my screen, and then with a smartwatch on top of that, those notifications would vibrate on the watch too. I noticed how much attention it took—like, even if the news wasn't particularly interesting, I still ended up looking at it." (interruptions)	"And also, noticing that the ability to tolerate boredom is really poor. That's probably the most concerning thing, that you constantly feel the need for stimulation. That's probably not such a good thing..." (worsened boredom tolerance)
She perceives her smartphone proficiency as good and uses her smartphone for 3-4 hours daily.	"But somehow it feels like everything has become short and fast, like... Communication has changed to be like that." (instant)	"And it's exactly that thing with those services, where there's always something new. So, it's always like, 'Oh, let me refresh one more time, maybe there's something else here.'" (hedonic gratification sought and obtained – novelty)	"I usually love reading books while on vacation, but I realized that I couldn't focus on them at all. Before, I would easily get immersed and read for hours, but now it was so fragmented [due to smartphone use]. I even started wondering if my brain had completely deteriorated." (techno-invasion)	"I also notice that it's quite overwhelming if I'm constantly following the day's news events in real time throughout the day. It definitely adds to the mental load." (fatigue)
She primarily uses various types of social media, like Instagram and Pinterest, as well as instant messaging services such as WhatsApp. She frequently browses news sites on her smartphone and occasionally uses an online dating application.				

Technostress and Smartphone Use Loop - Gratifications Sought and Obtained

First, we showcase situations in which users actively sought and successfully obtained gratifications but also encountered technostress. As a key aspect of our study was to gain insight into the driving forces of smartphone use that ultimately contribute to technostress, we inquired about the reasons for smartphone use with all our interviewees. Many promptly offered explanations that encompassed the purpose of their use (gratifications sought), how they engaged with their devices (dimensions of use), the resulting benefits (gratifications obtained), and concurrent experiences of technostress. To illustrate, one interviewee described her smartphone use, including the ensuing frustration and annoyance:

*Primarily, it's about seeing what friends are up to, how they're doing. Also, it's for inspiration and sometimes also for seeking information. On the surface, it sparks curiosity and brings a good mood, but sometimes it also leads to **frustration and annoyance**.*

Among our interviewees, the most frequently sought-after gratifications centered around various social aspects. For instance, when individuals pursued social connection (social gratification sought), they often engaged with their devices instantly or repeatedly (dimension of smartphone use). In cases of instant use, technostressors related to interruptions and invasion (and the associated constant availability) were particularly prevalent. Constant availability was a recurring topic, with many describing it as exhausting, frustrating, or annoying (15

interviewees). Yet the associated instant and repeated use were seen as something that is expected of them, serving a crucial purpose in obtaining social gratifications:

*It's really important [social gratifications] in a way that you feel like if you're not on your phone or if you don't see people's events and also don't report on your own life, then somehow you might be forgotten. [...] It's like it's a natural way to stay connected, and there's a lot of commenting through private messages, so it's not just passive scrolling, but also active discussions taking place there. [...] Yeah, I feel it's quite **exhausting**, having to be present all the time. It's maybe also, I'll add to the negative aspects, um, negative aspects somehow, this **need to be present all the time**. It's like this constant thought that you have to respond quickly, and even if you've seen a message and you're online, you don't respond, so it creates this strange, um, **pressure to act in a certain way**.*

*But now there's this expectation for real-time communication [on an online dating service]. And I feel like it's really **exhausting**, like you're supposed to always be available. And if you're not, then it's like, onto the next one [laughs]. Like, they expect... That constant real-time connection, always having the phone in your hand. It's kind of **distressing**... There are so many factors that made me decide it's better to just let it go, because it's... **It takes more than it gives**.*

In addition to social use, passing time with smartphones was highly prevalent in our data. This often occurred during brief moments when no other engaging activities were available. Associated with instant use, many interviewees (seven of them) reflected how their ability to tolerate boredom had decreased, which we see as an outcome of technostress. Even when users were able to pass the time using their devices, involving both gratifications sought and obtained, such behavior could still lead to technostress. Although this could emerge from a single instance of instant use, it was particularly common when use was repeated. This could create a vicious cycle: smartphones were used to alleviate boredom, but smartphone use might worsen the ability to tolerate boredom, leading to increased use. Overall, many interviewees expressed extreme annoyance with their decreased tolerance for boredom. Furthermore, in situations where hedonic gratifications were sought (as opposed to social gratifications), the interviewees did not seem to place as much value on obtaining them despite the momentary entertainment provided. As these two examples show about passing time using a smartphone and the associated issues with boredom tolerance:

*I even felt like not watching TV shows. Somehow, it felt like even when watching series, or at least during the commercials if you watch TV, or if you're watching Netflix there might be a boring part. So, **I might pick up my phone and start looking at it, it was really hard...***

*Like, whenever there's a moment where there's nothing to do, the phone is always in your hand, and you feel the need to send a message to someone or constantly be in contact with someone. It's kind of **overwhelming**, at least for me. And I've noticed that nowadays, my **lack of focus is really concerning**. For example, I can't even watch a full Netflix episode, not even a 20-minute one. At some point, I realize I've picked up my phone again. **I just can't maintain focus**.*

More specifically, many interviewees resorted to using their smartphones repeatedly and continuously to escape uncomfortable or even stressful situations. Such behavior could lead to something we call “techno-procrastination”, where individuals delay engaging in other activities by using their smartphones, reported explicitly by ten interviewees as a stress-creating condition. In these scenarios, users are typically able to obtain various hedonic gratifications, such as entertainment or simply escapism. Trying to escape uncomfortable situations by using a smartphone might provide momentary gratification but could be detrimental in the long run by prolonging the stressful situation:

*And you know, that's actually **one problem**; if there's a situation that becomes too **stressful**, I'd rather escape to my phone than try to face the problem, and then **confronting the problem gets delayed**. [...] Yeah, I get that momentary feeling of relief, but then I feel terrible again when I return to real life, and I immediately want to escape back. [...] So, I just **prolong being stressed**...*

Also, many interviewees highlighted how smartphone use often led to the postponement of their sleep patterns, where continuous use was central. In fact, 16 participants mentioned that smartphone use could contribute to issues with sleeping. Thus, while not everyone who used their smartphones continuously during the night considered it problematic, it had caused issues for the majority. The gratifications sought during such situations were often hedonic, and they were obtained by browsing content that was considered entertaining, amusing, and interesting. In such cases, the gratifications obtained were enough to keep them engaged with the devices, contributing to continuous use. However, despite obtaining the gratifications, less sleep was considered a problem:

***It has disturbed [my sleep]**. [...] It's probably the evening-oriented [use]. I'm already a night owl, so then I notice that, if it's the last thing before going to sleep, I open some social media and start looking at it. Or well, the last mistake is to start watching a YouTube video and then realize three hours later that I'm still staring at a YouTube video. So, it's definitely [laughs] **a problem for me** that I'm maybe a bit easily swayed by interesting content.*

In addition to social and hedonic gratifications, the interviewees used smartphones to stay up to date with news and current events. While this behavior was not as typical in our data, most interviewees did browse news concerning topical issues nationally and worldwide. Such was often done repeatedly because they wanted to stay informed about what was happening in real time. Additionally, versatile use was often engaged in due to different news sources providing different types of news. Even when the gratifications sought were obtained, browsing news could contribute to stress and anxiety due to the vast amounts of often negative information. While stress can be caused by news from various sources like TV or newspapers, it is emphasized in the context of versatile smartphone use because users have instant access to sources reporting on events worldwide. Nine interviewees discussed the stressful experiences they had had in relation to reading news on their smartphones. As one interviewee explained, she had experienced high levels of stress from following news online, despite wanting and being able to stay up to date:

*Well... I easily get **stressed** about the state of the world, and often, the news doesn't really focus on the positive things, so... I get this **anxiety** from all the bad news*

*happening around the world or in Finland. So, that's why I don't actively read the news. [...] I mean, I would like to stay up to date with what's happening in the world, but then when you force yourself to go through all the pages [of different Finnish news outlets], it just **becomes stressful... It's just stressful. And it makes you feel bad.** So then I've realized that, well, I don't have to read them.*

To summarize, obtaining gratifications does not inhibit experiencing technostress in smartphone use. While gratifications can sometimes alleviate negative feelings, this depends on the specific gratifications. The interviewees appeared to assign different values to various gratifications, which in turn influenced the technostress experienced (for example, social gratifications were seen as more important than hedonic ones). We emphasize that both the “whys” (gratifications sought and obtained) and the “hows” (dimensions of use) are important in understanding the emergence of technostress in this context. Next, we will discuss situations where gratifications are sought but not obtained, associated with technostress.

Technostress and Smartphone Use Loop - Gratifications Sought but not Obtained

Situations in which individuals seek but do not receive gratifications can happen in two ways. First, users may immediately realize they are not obtaining gratifications. For instance, this can happen when users wait for a message and check their device but find no new messages. Second, users might initially obtain the gratifications they seek, but over time (during a single session or over multiple sessions), these gratifications are no longer obtained. Such a mismatch of gratifications sought and obtained can be stressful because it creates a conflict within users regarding their behavior. Many interviewees said that continuously and repeatedly browsing social media feeds caused this, and they eventually stopped experiencing gratification, which elicited emotions like guilt, which was reported by seven interviewees. As one of them described:

***You start feeling a bit guilty**, like maybe you could have used this time for something more productive. [...] You occasionally think that, “Okay, it's actually good [browsing the smartphone],” that it's sort of like, for example, sometimes when it's in the evening before going to bed, it's kind of like a reset time. Even if you watch videos on YouTube or just browse something, it's like a way to reset yourself, especially if you've had something on your mind during the day, or you just need to unwind. That's okay. **But then, if you notice that you do it too often, you start feeling a bit guilty**, like, “Come on, you have resources to use for maybe something a little better, so use your time for something else sometimes.”*

While gratification mismatch is a common factor contributing to technostress in the situations discussed in this section, it is not the sole cause. For example, many interviewees browsed their smartphones in personalized fashion to find content about their interests, which could lead to them encountering online information bubbles. These bubbles can inhibit people from seeing content from a different perspective, resulting in gratifications not being obtained. Many interviewees believed that only being exposed to information solely from one perspective is harmful, as it can contribute to, for example, increased polarization. As the

following quote illustrates, one interviewee expressed concern and even fear about online information bubbles while nine interviewees in total discussed similar issues:

*When I started thinking about how much I've actually chosen myself, like where I join, and how much has come as a sort of feed, like "oh, that looks interesting, let's go there". And through that, **my own thinking has been reinforced and maybe even changed in some ways.** [...] So, if I hadn't been on these channels at all, how different a person would I be? Do these essentially shape or produce certain kinds of people? It's kind of a wild thought [...] So, it's kind of, even a bit **scary**.*

Personalized use can also contribute to technostress when individuals browse different digital content feeds to follow the lives of others. For instance, many experienced technostress when following the seemingly perfect lives of "influencers". While following such content can be inspiring, it can also have the opposite effect due to unfavourable comparisons. Algorithms often show users more of this type of content, which creates more opportunities for stress-inducing comparison behavior. In total, 16 interviewees discussed technostress relating to negative comparison behavior. The following quote provides an example of negative comparison and users' interests:

*If you've been a bit down in general, maybe it doesn't really help **when everything is, like, fantastic, and everyone seems so productive,** and I'm just sitting here scrolling through social media. [...] When I do handicrafts, it always felt like **no matter how amazing I made something, someone had made something much more amazing, and someone took better photos, and everyone seemed to have a slightly better relationship.** Or at least it looked like it because, you know, that's how it is, it's not exactly pressure, well, maybe pressure is the wrong word. But maybe a feeling of **inadequacy**. So, it's been kind of, and then somehow like, "Well, why am I knitting when my socks never look like that other person's socks?" or, "Why am I running to work every day when that one person runs 250 kilometers?" Like I should somehow reach their level.*

On a different note, many interviewees reported using different communication applications. When multiple applications are used, the overall information load can become exhausting. While a single application or service can contribute to technostress, the interviews showed that the potential for negative consequences increases when users engage in versatile use. When users receive too much information from multiple sources, it can become challenging to obtain gratifications because not all information is relevant. This overload, reported by 18 interviewees, can make it too challenging to find the information that is genuinely valuable, resulting in a burdensome and exhausting experience:

*In my free time too, it's like wondering if there are Snapchat messages or Instagram notifications, or maybe something on LinkedIn or elsewhere. [...] **So, yes, notifications come in a lot per day. In fact, I checked, and I've had 181 notifications on my phone screen today.** [...] Well, I think to some extent, now that there's an unlimited amount of information available, it does start to become **burdensome** at some point... After all, the amount of absorbable information is quite limited per day, what you can take in, and then it keeps adding more information every hour of the day, so it does start to become **exhausting** at some point.*

Furthermore, several interviewees mentioned using multiple services to avoid missing out on anything. Paradoxically, while versatile use is often done to mitigate FOMO (in total, 15 interviewees discussed FOMO), it can also increase this fear because there are so many different gratifications being sought. If an individual seeks to see everything across various social media platforms, instant messaging services, and news sites, it becomes easy to overlook something and, as a result, miss an opportunity to obtain gratifications, which can lead to technostress:

*Some stories [Instagram], for example, are only there for 24 hours and then disappear. There is a feeling of **FOMO**, like, you want to stay on top of things and want to see the information when it is still available. [...] Unless there's something like "I would have asked you to eat [with me]", of course **it's annoying** when you've missed something just because you haven't been checking your phone [instant messaging]. [...] And I wanted Snapchat because all my friends were on Snapchat, it felt like **I was missing out on so much** because I wasn't there.*

Summary of the Results

To summarize, the situations discussed represent some of the possible interactions among gratifications sought and obtained, dimensions of smartphone use, and technostress. While they are not an exhaustive list, they were central in our data. Based on them, we developed a model that illustrates the various concepts and their relationships. We made two important distinctions: whether gratifications sought are obtained or not. In both scenarios, technostress can emerge, but the nature of these situations differs. Obtaining gratifications does not necessarily eliminate technostress; however, it can help mitigate negative thoughts and emotions associated with it. Gratifications, both sought and obtained, provide insights into users' cognitions in relation to technostress in smartphone use. For example, the experienced strains and other outcomes of stress seemed to differ when comparing situations where gratifications were obtained (e.g., when gratifications are not obtained, guilt is often present in continuous use). Additionally, the dimensions of use can play a role in whether gratifications are obtained, thus affecting the experienced technostress (e.g., personalized or versatile use can actually inhibit obtaining gratifications, contributing to technostress), highlighting the holistic effect of the smartphone use loop in the emergence of technostress. In Table 3 below, we have compiled our new findings for the context of technostress.

Table 3. Summary of New Findings in the Context of Technostress.

Finding	Description
1) Gratifications sought, gratifications obtained, and the dimensions of smartphone use form a smartphone use loop that is crucial for understanding behavior underlying technostress experiences in smartphone use	The concept of smartphone use loop integrates both the whys and hows of smartphone use in technostress situations/experiences. For example, when a user seeks social gratifications and instantly engages with their smartphone disrupting the task currently at hand, such can lead to technostress (e.g., due to techno-invasion). If gratifications are not obtained, the positive feelings are not present to alleviate the stress. Furthermore, by seeking the gratifications again, the user can engage in repeated use that can lead to “more” technostress (e.g., due to techno-procrastination).
2) Gratifications sought and obtained provide insight into users' motivations for smartphone use in technostress situations/experiences	Hedonic, social, and utilitarian gratifications sought and obtained provide insight into why smartphones are used when users experience technostress. When users obtain gratifications they value highly, technostress experiences are not as prevalent (e.g., social gratifications emerged as most valued in our study). Furthermore, not obtaining gratifications can contribute to (increased) technostress. Thus, technostress experiences can differ based on the gratifications sought/obtained and whether the gratifications sought are obtained.
3) Dimensions of smartphone use provide insight into users' nature of activities performed to interact with information delivered via smartphones in technostress situations/experiences	We identified five dimensions of smartphone use (instant, repeated, continuous, personalized, and versatile) that provide insight into how smartphones are used when users experience technostress. The dimensions do not directly reflect technostress situations/experiences, but they provide insights into behavior that can contribute to technostress (e.g., personalized use can be stressful when users encounter online information bubbles).
4) Delineating technostressors and strains/other outcomes previously unidentified	Gratification mismatch, online information bubbles, and techno-procrastination emerged as technostressors previously unidentified in research. Furthermore, worsened boredom tolerance emerged as a negative outcome of technostress.

DISCUSSION

Research Contributions

This study makes three key research contributions. First, we combine theoretical insights from two distinct research streams, namely, uses and gratifications theory and technostress. Our approach enables a comprehensive examination of why and how personal use of digital content feeds on smartphones can lead to technostress. Previously, studies have examined the impact of personality traits (e.g., Hsiao, 2017; Lee et al., 2014) or IT characteristics (Ayyagari et al., 2011; Salo et al., 2019) on the emergence of technostress. However, technostress research has primarily focused on technostressors (e.g., overload) and their resulting strains (e.g., fatigue) or other outcomes (e.g., discontinued use) (Sun & Lee, 2022). We expand this perspective by investigating gratifications, which can be understood as underlying cognitions associated with technostress experiences. While the uses and gratifications theory has been previously applied in studies discussing the negative consequences of IT use (e.g., Baabdullah et al., 2022; Chaouali, 2016; Gentina & Rowe, 2020; Sun et al., 2020), we explain gratifications and technostress from a dual perspective following Palmgreen and Rayburn (1979): gratifications sought (closely tied to needs or motives) and gratifications obtained (satisfying needs by

receiving gratifications). Extant research has shown, for example, that users may not want to stop using IT due to the possibilities for obtaining hedonic gratifications, even though overall use may be harmful (Salo et al., 2022). We add to these findings by explaining how gratifications beyond the hedonic type may have similar effects. For example, when individuals engage instantly, repeatedly, or continuously with their smartphones and feel overloaded and exhausted due to the messages they send and receive, they nevertheless obtain social gratifications and wish to continue their use as the gratifications are highly valued.

We relate our findings to existing literature on technostress and smartphone use by building on prior discussions of types of smartphone use, such as using instant messaging for social, work, and study purposes, and their connections to technostress (Ardèvol-Abreu et al., 2023). Expanding on this, we explicitly examine the roles of dimensions of use and gratifications sought and obtained in the emergence of technostress, providing a more nuanced understanding of these relationships across a broader range of personal use contexts. Moreover, previous research has shown that using social media can be simultaneously stressful and enjoyable, and the users need to evaluate the balance of stress and various positive consequences (Ardèvol-Abreu et al., 2023; Cheikh-Ammar, 2020; Steelman & Soror, 2017). Regarding such a balance, we observed that smartphone use associated with social gratifications might align better with users' values than hedonic-oriented browsing which affected the technostress emergence. However, even more prevalent was that technostress was experienced when no gratifications were obtained, meaning that gratifications could alleviate technostress. Thus, we extend on the previous findings that not obtaining gratifications sought can, for example, contribute to fatigue when using social media (Ravindran et al., 2014) by offering more detailed explanations from the perspective of technostress and by discussing the effect of dimensions of smartphone use in the relationship between gratifications sought and obtained. Such findings contribute to existing technostress literature by providing new ideas into how the technostress process unfolds through cognitive antecedents.

Moreover, although the objective of this study was not to explicitly categorize technostress experiences based on demographic factors, some nuanced observations emerged in this regard. For example, participants who reported living with a partner frequently noted that their own or their partner's smartphone use had contributed to tension within their relationship. While previous studies have shown that technostress can manifest as issues to social relations (Salo et al., 2019), understanding the role of gratifications sought and obtained for technostress in such situations provides us with deeper insights into the situation. If smartphone users receive gratification from their use but simultaneously harm their relationships, such could call for a more explicit prioritization of one's cognitive patterns.

Second, we treat uses and gratifications as separate constructs and introduce the concept of smartphone use loop. We emphasize the importance of this distinction because the dimensions of use and gratifications are separate yet interconnected concepts, which can help us in discerning the "whys" and "hows" of smartphone use contributing to technostress. To address the "hows," we develop an explicit categorization for the dimensions of smartphone use, defined as the nature of activities users perform to interact with information delivered via smartphones. This categorization comprises five dimensions: instant, repeated, continuous, personalized, and versatile. Although some of the dimensions are present in IT on a broader scale (e.g., the Internet), we find that our dimensions together reflect what is characteristic of browsing digital content feeds on smartphones. The dimensions extend the existing body of

research on uses and gratifications theory by offering new insights for approaching use, which has typically been characterized at a more general level (e.g., ritualistic and instrumental use) (Rubin, 1984), or focused on different types of use derived directly from gratifications (e.g., entertainment use, social interaction, and information-seeking) (Ardèvol-Abreu et al., 2023; van Deursen & van Dijk, 2014). Furthermore, we add to previous studies that have focused on usage types (Bonds-Raacke & Raacke, 2010; Elhai et al., 2017) or user types (e.g., Brandtzæg, 2010). In related research, we notice some similarities between our dimensions and earlier findings. For instance, the amount of use (Blank & Groselj, 2014) aligns with the repeated dimension, and the extent of use (Maier, Laumer, Eckhardt, et al., 2015) corresponds to the continuous dimension. Moreover, constant use (Duke & Montag, 2017; Gerlach & Cenfetelli, 2020; Salo et al., 2022) could reflect both the repeated and continuous dimensions. However, for example, we see that repeated and continuous use are distinct from each other, which the term “constant” is unable to capture. Furthermore, we add to extant research by introducing dimensions not previously addressed. Overall, the dimensions do not directly reflect stressful experiences; instead, they can be seen as a part of the smartphone use loop which together with gratifications sought and obtained provide insights into cognitions and behavior that can eventually lead to technostress. This resonates with existing research stating that, for example, constant use is not inherently negative (Gerlach & Cenfetelli, 2020).

Since browsing dynamic digital content feeds on platforms such as TikTok can lead to time distortion and subsequent negative consequences (Roberts & David, 2023), it is crucial to understand how these negative outcomes unfold. Thus, we expand on existing research by explaining the processes through which such consequences emerge through the lens of technostress. With our dimensions of use, we also extend previous findings associated with compulsive and excessive use and technostress, which has been a common perspective especially centered around smartphone and social media use (e.g., Cao et al., 2018; Hsiao et al., 2017; Lee et al., 2014; Luqman et al., 2021). Repeated use may become compulsive, and continuous use may become excessive, but this requires users to perceive their behavior as uncontrollable or excessive, as per the definitions of compulsive and excessive use (Caplan, 2010; Luqman et al., 2017). As a part of the smartphone use loop, we observed the identified dimensions of use preceding a variety of different technostressors. With the instant dimension, interruptions, and invasion (e.g., Ayyagari et al., 2011) were central. In repeated and versatile use, especially online information overload (e.g., Fu et al., 2020) was highlighted. Furthermore, continuous use often contributed to or reflected techno-dependency (e.g., Salo et al., 2022). Personalized use was highlighted when the interviewees discussed negative life comparison (e.g., Fox & Moreland, 2015; Salo et al., 2019). Thus, although some of the observed technostressors are not novel, we contribute to research by delineating users’ underlying behavior associated with them. Through the concept of the smartphone use loop, our findings contribute to existing technostress research by explicitly highlighting both cognitive and behavioral antecedents of technostress, as well as their varying associations with different types of technostress experiences. This approach provides insights into why distinct types of technostress emerge from specific smartphone-related activities.

Third, although many of the technostressors we discuss have been previously established in various studies, we recognize that previous research has not fully explored all potential technostressors. By shedding light on the interplay between dimensions of smartphone use, sought and obtained gratifications, and technostress, we observed that a mismatch between

sought and obtained gratifications can manifest as a technostressor. When individuals seek specific gratifications from their smartphone use, for example, by continuously browsing social media feeds and do not obtain them, this can be stressful (e.g., leading to feelings of guilt). Furthermore, we introduce two additional technostressors, techno-procrastination and online information bubbles, that have not been addressed in previous technostress research. Techno-procrastination shares similarities with the concept of cyberslacking, which has been discussed before (e.g., Güğərçin, 2020; Lavoie & Pychyl, 2001). For instance, technostress could lead to cyberslacking in workplaces. However, we view techno-procrastination as a distinct stressor that can contribute to technostress emergence (e.g., procrastinating important tasks by repeatedly browsing a smartphone). Additionally, while previously identified technostressor techno-invasion (Maier, Laumer, Eckhardt et al., 2015; Tarafdar et al., 2007) may overlap to some extent with techno-procrastination, the key distinction lies in the specificity of techno-procrastination, which addresses situations where smartphone use not only invades one's life but also leads the individual to neglect important tasks. Thus, the invasive nature of IT by itself is not the trigger for technostress. This can be especially evident when individuals repeatedly access their smartphones in search for hedonic gratifications. Furthermore, although online information bubbles (or filter bubbles) (Savolainen, Oksa, Savela, Celuch & Oksanen, 2021) have previously been associated with negative consequences related to IT use, to the best of our knowledge, they have not been conceptualized as a part of the technostress process before.

Regarding strains/other outcomes, we discuss “worsened boredom tolerance” as a strain/outcome of technostress. When individuals are so used to instantly and repeatedly accessing their smartphones (e.g., to check for messages), it might lead to them being unable to tolerate situations in which they are not receiving stimuli from their smartphones. Additionally, if individuals rely on smartphones to alleviate boredom while simultaneously perceiving that their smartphone use has diminished their capacity to tolerate boredom, this dynamic may perpetuate a cycle of increased smartphone use. This increase could manifest through shorter intervals tolerated without smartphone stimulation, more frequent instances of smartphone access, prolonged periods of continuous use, greater personalization in browsing behavior, and engagement with a wider variety of content types, thereby encompassing linkages to all the dimensions of use identified in our study. Moreover, boredom proneness has been linked to overload and fatigue in social media use (Whelan et al., 2020). Thus, the experiences of boredom and technostress may vary among individuals, as some people may be more prone to boredom. In summary, identifying new technostressors and strains is valuable for a more comprehensive understanding of stress that can arise when using different technologies in various contexts and ways. It underscores that technostressors and strains are not universally applicable and should not be viewed as “one size fits all”.

Practical Implications

Different stakeholders could use our findings to understand and combat the negative effects of technostress in personal smartphone use. First, users themselves could learn from our results. With the help of our findings, users can, for example, reflect if the situations we discuss are relevant to them, and accordingly, assess the levels of technostress they might be experiencing due to certain dimensions of smartphone use. Moreover, users can examine the relationships between the gratifications they seek and those they obtain in relation to technostress to evaluate

if the use they are engaging in is actually rewarding. Thus, evaluating one's behavior based on the smartphone use loop could provide users with insight into their technostress experiences and the possibilities for mitigating them. Focusing on specific user groups, such as individuals whose studies or work are adversely affected by technostress, this study could provide valuable insights into the particular situations where technostress interferes with critical academic or professional tasks. These users might also explore alternative behavioral strategies to address and mitigate such challenges effectively.

Second, service providers could use our findings to design applications that take technostress into consideration since previous studies have shown that technostress may contribute to users' discontinued service use (e.g., Luqman et al., 2017; Maier, Laumer, Weinert et al., 2015). Many of our interviewees emphasized that they believed the services they use were purposefully designed to deliver stimuli that they find gratifying, which is why it can prove difficult to resist browsing, leading to issues. Even though service providers aim to ensure user engagement and profits, we believe that technostress is a phenomenon that could eventually prove harmful to providers, too. Thus, for example, social media providers should implement functionalities that make it easier and more transparent for users to manage their personalized use.

Third, although we studied the personal use of smartphones and technostress, our findings can also be helpful for employers. If users feel drained due to their personal smartphone use, such may also affect their performance at work. Our findings could help employers understand what kind of personal smartphone use, especially within working hours, is harmful and what kind could prove beneficial (e.g., small breaks to release tension). In addition, due to the increased working from home due to the COVID-19 pandemic, the possibilities for cyberslacking have increased. In the long run, such behavior could prove harmful to both workers and employers, and employers should educate their workers about the possible consequences of using smartphones during working hours from different perspectives. Such could be done, for instance, by creating guidelines informed by the central situations we present in our results.

Limitations and Future Research

It must be acknowledged that our study has several limitations. First, we focused solely on techno-distress, omitting the positive manifestation of technostress. As techno-eustress is a part of the holistic technostress process, this could be something to study in the future, as research exploring positive stress in personal IT use is scarce. Second, we relied on self-reported data, meaning the interviewees had to recall past experiences concerning their smartphone use. Due to this, memory bias may be present. Although we took precautions to mitigate such challenges, there are always possible inaccuracies when self-reporting and recalling past events. Moreover, the self-reported nature of the data introduces the potential for social desirability bias, where participants may provide responses they perceive as more acceptable or favorable. To mitigate the limitations associated with self-reporting, participants were given ample time to reflect on their responses, and they were explicitly informed that there were no right or wrong answers, as the primary focus was on understanding their personal experiences and stories. Third, although qualitative methods were deemed valid for the research context and objectives, they inherently limit the generalizability of the findings. Nonetheless, the primary aim was to offer

a deep and nuanced understanding of the phenomena under study by exploring detailed narratives of the study participants' experiences. Future research could expand on these insights by employing alternative methods to generate more generalizable results. Fourth, the assessed demographic factors also reflect limitations, as our interviewees were mainly young adults from similar cultural and educational backgrounds. Fifth, as the second data collection phase of the study (20 interviews) was conducted during the COVID-19 pandemic, other limitations may have arisen. For example, some interviewees thought the pandemic had increased their smartphone use (e.g., due to spending more time at home). Sixth, the services, applications, and sites used by our interviewees represent a limiting factor. Due to our focus on digital content feeds, our study only included some types of personal smartphone use (e.g., playing games or using online banking were omitted). We may have missed exciting and important narratives regarding smartphone use that could have been relevant to our research goals. This, however, could be an exciting avenue for future research.

Our study presents multiple possibilities for future research. First, future research could explore the positive aspects of technostress within contexts similar to those examined in this study. While the concept of techno-eustress has gained increasing attention, there remains limited research on its occurrence in personal and voluntary IT use settings (Tarafdar et al., 2024). Future studies could build upon our approach to examining gratifications and technostress by investigating how the gratifications sought and obtained through IT use are linked to positive manifestations of technostress. For example, prior research has shown that technostress spilling over from work to home can influence partnership satisfaction, either positively or negatively (Benlian, 2020). Expanding on this, future studies could examine whether technostress arising from activities such as social media use might also have positive effects and how such outcomes influence partnership satisfaction. Second, it is important to highlight how the smartphone use loop and its interplay with technostress is unique to each user, since stress is a subjective phenomenon (Lazarus & Folkman, 1984). This indicates that more research must be conducted to understand the relations between 1) different personalities and technostress and 2) different situational factors and technostress. It may also prove interesting to extensively address how technostress can affect the smartphone use loop. Third, with regard to the uses and gratifications theory, one of the leading suggestions is that people are active when choosing media to consume (Katz et al., 1974). However, since many of the feeds are personalized by algorithms, it could be claimed that the active aspect of the uses and gratifications theory is something to reconsider in the future. Previously, it has been suggested that how algorithmic recommendation is perceived varies between individuals, which could affect how services utilizing such are used (Min, 2019). In accordance with this, it could be argued that people's attitudes toward personalized services and their use could be the active aspect of media consumption in this context, even if algorithms guide the consumption event itself to some degree, which could be an interesting future research avenue. In a similar vein, habits could be studied as a part of the equation. Fourth, further research is needed to clarify how specific dimensions of smartphone use are explicitly linked to particular gratifications and technostressors. We propose that this exploration could benefit from a quantitative approach, investigating these associations in greater depth. In this study, we presented examples of potential relationships between dimensions of smartphone use, gratifications sought and obtained, and technostress. These relationships could serve as a basis for developing theoretical models that can be tested quantitatively to confirm their existence and, if validated, to assess

the strength of the associations between dimensions of use, gratifications, stressors, and strains. Fifth, gratifications and technostress could be examined by distinguishing between process gratifications and content gratifications, which refer to the gratifications derived from engaging with the media itself and those obtained from the content delivered by the media, respectively (Cutler & Danowski, 1980). This approach could offer deeper insights into the role of various types of content and activities in the technostress process.

CONCLUSION

In this paper, we explore technostress caused by browsing digital content feeds on smartphones. We identify five dimensions of smartphone use (instant, repeated, continuous, personalized, and versatile), which reflect how smartphones are used in the context. Subsequently, we discuss the gratifications sought and obtained (hedonic, social, and utilitarian), which reflect why smartphones are used. We introduce the concept of smartphone use loop, bringing forth new knowledge by integrating both what is sought and obtained from the use (gratifications) and how the smartphone is used (dimensions of smartphone use). We assess the interplay between the smartphone use loop and technostress, contributing to the technostress literature by linking the different dimensions of use and the gratifications with technostressors and strains/outcomes. As a practical implication, service providers could use our findings when designing digital content feeds to minimize the likelihood of user behavior that could result in technostress manifesting as, for instance, discontinued use.

IMPLICATIONS FOR RESEARCH

We contribute to research especially in the area of technostress by delineating the hows and whys of browsing digital content on smartphones, and their associations with emerging technostressors and the associated strains/outcomes. Thus, we underline how the technostress process is influenced by users' underlying motivations, their potential fulfillment, and the nature of their actions, thus highlighting both cognitive and behavioral antecedents for technostress. By incorporating the concepts of gratifications, dimensions of use, technostress, smartphones, and digital content feeds, we offer a multidisciplinary approach for holistically explaining technostress emergence. The conceptualization of the smartphone use loop and the dimensions of use presents an opportunity for researchers to develop refined frameworks for analyzing user behavior associated with technostress. We find it crucial to further understand why individuals, especially while engaging in voluntary and leisure-oriented IT use, end up in situations that elicit technostress. Furthermore, investigating how different dimensions contribute to various technostressors can provide insights into nuanced aspects of user experiences and inform the studies aimed at mitigating technostress.

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