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Coping with technostress-related goal hindrances: multidimensional and hierarchical nature of goals

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Abstract

Purpose – While considerable attention has been directed towards identifying antecedents and consequences of technostress in various contexts, research is lagging on its mitigation, especially in personal use contexts. Here, we explain how individuals employ coping to shield their humanistic and instrumental goals from technostress-related hindrances in personal smartphone use. As individuals' goals can be considered pivotal in shaping their lives as worthwhile, identifying solutions for managing the negative consequences of technostress on, for instance, users' well-being and productivity, is paramount. By focusing on smartphones, which are used by billions, we provide impactful insight relevant for numerous stakeholders.

Design/methodology/approach – We conducted qualitative research by collecting and analyzing rich data (semi-structured interviews) from 38 smartphone users.

Findings – By investigating coping with smartphone-related technostress that manifests as hindrances to users' humanistic (e.g. attaining meaningful life) and instrumental (e.g. managing personal information) goals and their sub-goals (e.g. experiencing happiness and maintaining information security, respectively), we address the multidimensional and hierarchical nature of goals. We further extend this perspective by examining how coping relates to goal explicitness: anticipatory coping tends to prevail when goals are explicit, while reactive coping is more common with implicit goals. Additionally, we showed that users' goals, technostress, and the associated coping can be in conflict, requiring goal prioritization from users.

Originality/value – We address an important gap in the literature by examining the intricate dynamics of coping with the unintended outcomes of personal smartphone use manifesting as technostress-related hindrances to users' goals.

Keywords Technostress, Coping, Anticipatory coping, Reactive coping, Humanistic goal, Instrumental goal, Smartphone

Paper type Research article

Introduction

As society increasingly relies on information technology (IT) across various activities, researchers and practitioners have acknowledged that IT use can elicit experiences of stress in individuals, a phenomenon known as technostress (Tarafdar *et al.*, 2007, 2019). Although the idea of technostress originated from the organizational context, it has been shown that technostress is remarkably prevalent even when IT use is personal, voluntary, and intended for leisure (Nastjuk *et al.*, 2024; Salo *et al.*, 2022). In personal IT use (i.e. use not centered around working or studying), technostress can negatively impact users' well-being (Dhir *et al.*, 2018) and potentially contribute to mental health issues (Rasmussen *et al.*, 2020). In such a context, especially smartphones have been associated with various technostress-related negative outcomes, such as issues with sleep (Luqman *et al.*, 2021; Salo *et al.*, 2019) or even reduced quality of life (Lee *et al.*, 2016). Furthermore, IT has blurred the boundaries between leisure

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and work, causing conflicts due to IT-mediated personal lives interfering with work demands, and vice versa (e.g. Benlian, 2020; Burleson and Greenbaum, 2019; Tams *et al.*, 2020). Overall, the complex interplay between humans and IT has created a multifaceted landscape that fosters the emergence of technostress leading to many issues, including hindrances to individuals' goals (Tarafdar *et al.*, 2019). Due to the ubiquitous presence of smartphones in our society and the manifold potential issues associated with their use, it is crucial to understand how smartphone-related technostress could negatively affect users and how technostress could be alleviated, which we explore from the perspectives of coping and individuals' goals.

Here, we define goals as internal representations of desired states that encompass a broad spectrum, ranging from basic physiological benchmarks to complex cognitive visions of aspirations and accomplishments (Austin and Vancouver, 1996, p. 338). Individuals' goals could include achieving happiness (e.g. experiencing satisfaction and well-being while avoiding distress) and mastery (e.g. improving oneself and achieving something while avoiding performance decrement) (Austin and Vancouver, 1996). As "stressful situations are often stressful precisely because they threaten or harm valued goals" (Folkman, 2008, p. 9) and individuals can employ coping strategies (e.g. mental disengagement) to manage stress that impedes goal attainment (Carver *et al.*, 1989), anchoring technostress and coping with it through a goal-oriented perspective helps explain how to manage the unintended and situation-specific consequences of IT use. As individuals' goals can be "essential components of a person's experience of his or her life as meaningful and as contributing to the process by which people construe their lives as meaningful or worthwhile" (Emmons, 2003, p. 107), understanding of the dynamic nature of goals, technostress, and coping could help us find new ways to improve individuals' well-being and productivity.

In the information systems (IS) discipline, both humanistic (e.g. increasing well-being) and instrumental (e.g. increasing productivity) goals and outcomes associated with IT use have been highlighted (Sarker *et al.*, 2019). Regarding this, a call has been made for more synergized research and practice efforts to explore both humanistic and instrumental goals and outcomes, as discrepancy between them could lead to various issues, including technostress (Sarker *et al.*, 2019). This emphasizes the need for more research on technostress in different contexts and with different approaches, and scholars have advocated for more comprehensive investigations into managing technostress (Tarafdar *et al.*, 2019). There is a particular need for research on various mitigation practices or coping strategies for personal IT use (Salo *et al.*, 2022).

Here, we define coping as the dynamic emotional and behavioral efforts individuals engage in to manage situations they appraise as stressful (Folkman and Moskowitz, 2004). Extant research on technostress has explored coping from various perspectives, such as delineating different types of proactive and reactive coping strategies (Pirkkalainen *et al.*, 2019), as well as problem-focused and emotion-focused strategies (Zhao *et al.*, 2020). Despite a growing body of technostress research, studies on coping remain fragmented. Existing work has not sufficiently examined how individuals' goals, especially at different levels of abstraction, influence coping responses. Similarly, the temporal dynamics of coping remain underexplored, particularly how people engage in anticipatory or reactive strategies depending on whether the goals hindered by technostress are explicit or implicit. While humanistic and instrumental goals have been discussed in organizational contexts (e.g. Luoma *et al.*, 2020), little is known about how these goals shape coping in personal smartphone use. This gap limits our understanding of how technostress hinders goal pursuit and how individuals manage such hindrances through coping.

Thus, our research question was developed from gaps identified in the literature. Building on the transactional view of stress (Lazarus and Folkman, 1984), coping frameworks that distinguish between anticipatory and reactive strategies (e.g. Pirkkalainen *et al.*, 2019; Reuter and Schwarzer, 2012), and the distinction between humanistic and instrumental goals (Austin and Vancouver, 1996; Sarker *et al.*, 2019), we aim to bridge these strands by conceptualizing coping not solely as a reaction to stress, but as a process shaped by the

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structure, salience, and abstraction level of individuals' goals. These theoretical perspectives collectively informed our focus on how technostress manifests as goal hindrances and how users manage such hindrances through coping, prompting us to address the following research question: *How can individuals cope with technostress that manifests as hindrances to their humanistic and instrumental goals?* To study this, we collected and analyzed in-depth interview data from 38 smartphone users who had experienced technostress.

Our study makes three main research contributions. First, we anchor the utilization of coping strategies to the specific consequences of technostress through a goal-oriented perspective by explaining how technostress manifests as hindrances to individuals' humanistic and instrumental goals. We discuss how stress and unmet goals are associated (Folkman, 2008) and highlight coping with technostress as a form of goal shielding (Bélanger *et al.*, 2013; Shah *et al.*, 2002). We uncover coping strategies individuals engage in to deal with technostress-related hindrances to goals (e.g. humanistic goal of meaningful life attainment) and their sub-goals (e.g. experiencing happiness), acknowledging the multidimensional hierarchical nature of goals (Wicker *et al.*, 1984). Second, our observations reveal that when goals are explicit (e.g. instrumental goal of completing assignments on time), individuals tend to have more control over the situation, and their coping strategies lean toward being anticipatory (Folkman and Lazarus, 1985; Reuter and Schwarzer, 2012). Conversely, when goals are implicit (e.g. the humanistic goal of maintaining self-image), coping is dominantly reactive. Third, we explore the synergy and conflicts between humanistic and instrumental goals associated with IT use (Sarker *et al.*, 2019). We observed that conflicts often arise associated with individuals' goals and smartphone use, complicating the technostress and coping processes. Employing certain coping strategies for shielding specific goals may inadvertently harm other goals, requiring goal prioritization from users.

Theoretical background and related work

(Techno)stress

Stress embodies a dynamic interplay between individuals and the environment, and it emerges when individuals appraise their interaction with the environment as overly demanding (Lazarus, 1966; Lazarus and Folkman, 1984). The transactional view conceptualizes stress as a subjective and evolving process, shaped by how individuals interpret both external demands and their capacity to respond to them (Lazarus and Folkman, 1984). Central to this view is the appraisal process, through which individuals assess the personal relevance of a situation and their ability to cope – referred to as primary and secondary appraisals, respectively. Primary appraisal concerns whether an event or situation is personally significant – particularly in relation to one's values, goals, beliefs, or intentions – while secondary appraisal involves evaluating what coping options are available and how effectively one can manage the demands of the situation, especially if it has been appraised as harmful, threatening, or challenging (Lazarus, 1999, pp. 75–76). We wish to note here that although stress can be negative or positive (Selye, 1974), we focus on the adverse manifestations of stress.

In specific, we study stress experienced due to IT use, known as technostress (Ragu-Nathan *et al.*, 2008; Tarafdar *et al.*, 2019). Technostress forms through technostressors (e.g. information overload), which are the creators of stress that emerge due to the interplay between individuals and their technological environment, leading to strains and other outcomes, which are users' reactions to stressful stimuli and events (e.g. exhaustion) (Ayyagari *et al.*, 2011; Tarafdar *et al.*, 2019). Thus, the misfit between an individual's resources and the technological environment is central to technostress emergence (Ayyagari *et al.*, 2011), which aligns with the transactional view of stress (Lazarus and Folkman, 1984). This highlights that neither the individual nor the IT environment singularly shapes technostress; their interaction and users' appraisals of the interaction are key (Califf, 2022; Tarafdar *et al.*, 2019). Here, we note that technostressors leading to negative outcomes have been called hindrance technostressors (Califf *et al.*, 2020). Although we refer to hindrances throughout the paper, we do not refer

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solely to hindrance technostressors. Rather, we reflect the all-encompassing hindering impact of technostress on individuals' goals.

Although the concept and definition of technostress emerged in the 1980s (Brod, 1982), research on the topic proliferated in the 2000 and 2010s (e.g. Ayyagari *et al.*, 2011; Ragu-Nathan *et al.*, 2008; Tarafdar *et al.*, 2007, 2015, 2019; Wang *et al.*, 2008). The first wave of studies focused predominantly on organizations, exploring issues such as the loss of productivity and job dissatisfaction caused by technostress (Tarafdar *et al.*, 2007). Over the past decade, technostress research has expanded beyond organizational boundaries to encompass personal and leisure-oriented IT use. Such research has been led by studies focusing on social media (Maier *et al.*, 2015a, b; Salo *et al.*, 2019; Tarafdar *et al.*, 2020a) and smartphones (Lee *et al.*, 2014; Whelan and Turel, 2023). In such contexts, the adverse outcomes of technostress identified include problems with concentration, sleep, and social relations (Fox and Moreland, 2015; Hughes and Burke, 2018; Salo *et al.*, 2019). Furthermore, the consequences of IT use often cross the boundaries of personal and professional lives, causing conflicts between leisure time and work obligations (e.g. Benlian, 2020; Tams *et al.*, 2020), as well as academic pursuits (e.g. Cao *et al.*, 2018; Whelan *et al.*, 2022). Although technostress has emerged as a significant phenomenon within our IT-driven world, studies are still limited in delineating the dynamics of coping with concrete, situation-specific, and experience-centric negative consequences of technostress. As the concept of coping has been tightly associated with stress for decades (Lazarus and Folkman, 1984) and many studies focusing on technostress have adopted this view (e.g. Pirkkalainen *et al.*, 2019; Tarafdar *et al.*, 2020a), we deemed the approach suitable for our research.

Coping (with technostress)

Coping refers to the emotional and behavioral efforts individuals engage in to manage situations they appraise as stressful (Folkman and Moskowitz, 2004). The concept of coping has been applied in organizational IT research from various angles, including user adaptation (Beaudry and Pinsonneault, 2005) and responses to IT-related threats (Liang and Xue, 2009). Focusing on personal IT use, research has shown how individuals manage situations in which IT challenges their identity through behavioral and cognitive responses (Nach and Lejeune, 2010) and how adolescents can cope with technostress by using IT consciously (Schmidt *et al.*, 2021). Other specific coping strategies identified in personal IT use and technostress contexts include tolerating stressful situations, recovering from strains, reducing the cause of stress (Salo *et al.*, 2017), distraction (Tarafdar *et al.*, 2020a), and use avoidance (Maier *et al.*, 2015b). For instance, distraction as a coping strategy for technostress caused by social media use can be achieved either through the same social media platform or through alternative means (Tarafdar *et al.*, 2020a). Also, prior research has examined coping through a temporal lens, identifying at least four main types: reactive, anticipatory, proactive, and preventive coping (Reuter and Schwarzer, 2012). Proactive coping involves continuously accumulating resources to manage potential future challenges (Aspinwall and Taylor, 1997), whereas anticipatory coping addresses specific, expected stressors – essentially the "management of known risks" (Reuter and Schwarzer, 2012, p. 505). In the present study, the potential risks are predominantly known (e.g. technostress manifesting as hindrances to sleep and studying). Thus, we highlight anticipatory coping rather than proactive coping.

While coping with technostress has garnered increasing scholarly attention, our literature review reveals that existing research has not sufficiently explored the underlying factors influencing coping or the temporal dynamics of coping, particularly in the context of personal IT use. To clarify how our work relates to this stream of research, we conducted a focused review of studies that explicitly examine coping with and mitigating technostress (see Table 1 for an overview). Although other closely related studies on IT use and coping are referenced throughout the text to support theoretical grounding, we excluded them from the table to maintain a clear emphasis on technostress-specific research. The table summarizes existing

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Table 1. An overview of central studies focusing on coping and mitigation of technostress

Article	Context	Coping/mitigation strategies	Key findings/contributions
D'Arcy *et al.* (2014)	Work-related IT use (information security perspective)	Emotion-focused coping (moral disengagement)	Shows that security-related technostress elicits emotion-focused coping via moral disengagement, heightening noncompliance; introduces framework linking security stressors, coping, and risky behavior
Galluch *et al.* (2015)	Laboratory experiment (IT interruptions)	Method control, resource control	Identifies method and resource control as coping for IT interruptions; each alleviates conflict or overload stressors while aggravating the other
Gaudioso *et al.* (2017)	Work-related IT use (government-related organization; different roles)	Adaptive coping, maladaptive coping	Finds that workers mix adaptive and maladaptive coping (more prevalent); adaptive coping reduces exhaustion and maladaptive exacerbates it, underscoring coping choices in technostress outcomes
Hauk *et al.* (2019)	Work-related IT use	Functional coping (active coping, seeking instrumental social support); dysfunctional coping (behavioral disengagement)	Shows that older employees face more technostress but develop coping that reduces strain over time; finds that lower behavioral disengagement mediates reduced technostress impact with age
Hung *et al.* (2015)	Work-related IT use (mobile phones)	Proactive personality (confrontation of situations, transformation of situations)	Demonstrates confronting-situations trait of proactive personality buffers productivity loss from communication overload, highlighting proactive personality's role in technostress mitigation
Ioannou *et al.* (2024)	Work-related IT use (multiple industries)	Mindfulness	Shows that mindfulness lowers technostress and boosts job satisfaction, whereas IT mindfulness elevates user satisfaction and task performance
Lin *et al.* (2021)	Social media use	Adaptive coping, maladaptive coping	Finds that information, communication, and social overload evoke adaptive coping; only communication overload elicits maladaptive coping. Adaptive reduces, maladaptive increases social-media use discontinuance intention

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Table 1. Continued

Article	Context	Coping/mitigation strategies	Key findings/contributions
Pflügner *et al.* (2021)	Work-related IT use (white-collar workers)	Mindfulness	Confirms that mindfulness lowers perceived technostressors yet fails to buffer their link to burnout, underscoring mindfulness' partial limitations in coping with technostress
Pirkkalainen *et al.* (2019)	Work-related IT use (multiple industries)	Proactive coping (IT control, positive reinterpretation); reactive coping (distress venting, distancing from IT)	Explains that reactive coping (venting, distancing) mitigates technostress-related productivity loss; proactive coping (reinterpretation, IT control) amplifies these benefits and directly boosts productivity
Salo *et al.* (2022)	Personal IT use	Modifying IT use, switching to an alternative IT, taking a temporary break, quitting use permanently	Maps steps of technostress mitigation (identify stressors and their actualization costs, reinterpret use, plan, execute); shows that self-regulation barriers make even simple actions difficult
Schmidt *et al.* (2021)	Adolescents' IT use	Emotion regulation, knowledge acquisition, behavior adaptation, technology adaptation, social rules	Examines adolescent technostress coping: girls are more avoidance-oriented than boys; show that coping frequency rises with stress intensity, though some adolescents deviate from this
Sharma and Gupta (2023)	IT use in education (technology-enhanced learning)	Emotion-focused coping (general emotional support, emotional venting, academic disengagement); problem-focused coping (academic planning, efficacy)	Shows that harm/threat appraisals spur emotion-focused coping; positive/challenge appraisals spur problem-focused coping. Emotion-focused coping lowers, problem-focused coping enhances learning satisfaction
Tarafdar *et al.* (2020a)	Social media use	Distraction within and outside social media as coping behavior	Identifies distraction within and outside social media as coping; shows that distraction mitigates stress but simultaneously heightens social-media addiction risk
Tarafdar *et al.* (2020b)	Work-related IT use	Reduce IT-related emotions and distress, develop IT capacity, develop IT use demarcations	Identifies three-category, seven-behavior coping taxonomy; follow-up testing shows each category differently moderates technostressors' negative impact on IT-enabled productivity

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Table 1. Continued

Article	Context	Coping/mitigation strategies	Key findings/contributions
Tuan (2022)	Work-related IT use (service industry)	Proactive coping, mindfulness	Highlights that dispositional and interpersonal mindfulness foster proactive technostress coping via prevention and promotion focus; technostress and job insecurity dampen mediation pathways
Weinert *et al.* (2020)	Laboratory experiment (simulated techno-unreliability)	Instrumental support, emotional support	Explains that instrumental support improves performance and reduces exhaustion and arousal under techno-unreliability (e.g. computer freeze); emotional support alleviates exhaustion only
Yener *et al.* (2021)	Work-related IT use	Technology self-efficacy, time management	Introduces two-step workplace stress management: first bolster self-efficacy to control stress, then apply structured time-management to reduce it
Zhao *et al.* (2020)	Work-related IT use	Emotion-focused coping, problem-focused coping	Shows that technostress creators inconsistently shape appraisals; problem-focused coping mediates the impact of challenge appraisals and emotion-focused coping mediates the effects of hindrance appraisals on IT-enabled productivity
Zhu *et al.* (2023)	Work-related IT use (accounting information systems)	Proactive coping, reactive coping	Models how accounting-system features drive challenge or hindrance technostressors; these appraisals activate proactive or reactive coping, ultimately influencing job burnout
Our study	*Personal smartphone use*	*Coping as goal shielding, reactive and anticipatory coping (use modifying, attitude modifying, settings modifying)*	*Introduces coping as goal shielding, explains anticipatory versus reactive coping by goal explicitness, and reveals coping-related goal-conflicts causing secondary technostress*

Source(s): Table created by authors

studies by context, coping approach, and key findings or contributions. As the table shows, most reviewed studies focus on workplace settings and emphasize either problem-focused or emotion-focused coping. Some studies also acknowledge coping temporality – for example, individuals in organizations may engage in proactive coping (e.g. positive reinterpretation of IT) or reactive coping (e.g. distancing from IT) in response to technostress (Pirkkalainen *et al.*, 2019). However, no prior work has examined how the use of anticipatory or reactive coping strategies may be shaped by the explicitness or implicitness of users' goals. From a different angle, several studies distinguish between adaptive or functional (beneficial) and maladaptive or dysfunctional (detrimental) coping strategies (e.g. Gaudioso *et al.*, 2017; Lin *et al.*, 2021). Yet, this literature has not explored how such coping strategies relate to goal conflict or goal synergy – factors that could deepen our understanding of why certain coping efforts are

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perceived as beneficial or detrimental by users. Our study addresses these gaps in technostress and coping research by focusing on personal smartphone use, applying a hierarchical goal lens, examining the relationship between coping temporality and goal explicitness, and analyzing how coping efforts may generate goal conflicts.

Next, we conceptualize the role of users' goals in the technostress and coping process, providing a foundation for understanding how individuals' goals shape both the experience of technostress and the selection of coping strategies.

Goals and coping with (Techno)stress

We adopt a lens that synthesizes several complementary research streams on goals to deepen our understanding of how technostress triggers coping through goal hindrances. Specifically, we integrate accounts of hierarchical goal structures (Austin and Vancouver, 1996; Sarker *et al.*, 2019; Wicker *et al.*, 1984), the relationship between goals and meaning (Emmons, 2003), research on goal explicitness (Bittner, 2011; Höchli *et al.*, 2018) and insights on goal shielding (Bélanger *et al.*, 2013; Shah *et al.*, 2002). This synthesis complements the transactional view of stress and coping by foregrounding how goal relevance guides primary appraisal – through evaluations of whether IT demands hinder focal goals – and shapes secondary appraisal by influencing which coping options are perceived as effective in protecting or restoring goal pursuit.

We draw from both organizational perspectives and individual-level behavioral research to identify shared conceptualizations of goals across contexts. Generally, broader categories of goals comprise interrelated sub-goals that together guide behavior (Austin and Vancouver, 1996). In organizational contexts, goals such as increasing productivity and profitability (instrumental), alongside achieving greater well-being and job satisfaction (humanistic), have been discussed (Chatterjee *et al.*, 2021; Sarker *et al.*, 2019). Sarker *et al.* (2019) emphasize the importance of integrating both instrumental (e.g. efficiency, productivity) and humanistic (e.g. well-being, meaningful engagement) goals in the evaluation of IT use, warning that neglecting either can result in misaligned outcomes, encouraging scholars to move beyond purely utilitarian assessments and consider the broader impact of IT on users' lives. This perspective is particularly relevant here, as a narrow focus on instrumental use may contribute to negative experiences, technostress among them (Sarker *et al.*, 2019).

At the individual level, humanistic goals include the pursuit of happiness, positive self-evaluation, and belonging (Austin and Vancouver, 1996), whereas instrumental goals pertain to career advancement, academic success, and the completion of valued tasks (Tkach and Lyubomirsky, 2006). Overall, goals are intertwined with the fundamental human tendency to search for meaning in life (Emmons, 2003). Thus, it is important to understand the conditions that hinder goal pursuit, and the coping responses individuals employ as a result. Also, goals can be discussed based on different levels of abstraction (Carver and Scheier, 2001; Höchli *et al.*, 2018). For instance, research indicates that explicit goals are specifically planned, more concrete, and imbued with conscious thought, whereas implicit goals lack explicit planning, are more abstract, and are influenced by unconscious thinking (Bittner, 2011). Goals of different levels of abstraction can be linked, meaning that achieving more explicit, specific goals is crucial for achieving more implicit, abstract goals (McIntosh *et al.*, 1995). Approaching the hindering nature of stress on goals from this perspective, even daily minor stressors may harm individuals' explicit (e.g. meeting a deadline at work) and implicit (e.g. experiencing happiness) goals (Verkuil *et al.*, 2015). Thus, specific instrumental goals can also affect the achievement of abstract humanistic goals, highlighting the need for synergy between goals of different natures and abstractions.

Extant research has shown that individuals can cope with stress that hinders goal attainment with different strategies, such as mental disengagement (Carver *et al.*, 1989). Furthermore, the concept of goal shielding has been emphasized as a behavioral mechanism that individuals use to deal with hindrances to their goals. This concept entails protecting one's goals from

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interfering factors and inhibiting alternative, counterproductive behavior (Bélanger *et al.*, 2013; Shah *et al.*, 2002). Discussing goals and coping with technostress specifically, research has shown that presenteeism associated with IT can cause conflicts between humanistic and instrumental goals for which users can employ coping strategies (Luoma *et al.*, 2020). However, prior work has not detailed how smartphone-related technostress differentially affects humanistic and instrumental goals at multiple abstraction levels, nor how individuals cope with those effects. Building on the view of humanistic and instrumental goals in IS by Sarker *et al.* (2019), we examine how IT use contributes to technostress that hinders users' goals and analyze coping as goal shielding in this process.

Research methods

Data collection

To study our research problem, we conducted a qualitative study based on interviews and content analysis (Lune and Berg, 2017). We used qualitative research methods as they are particularly suitable for studying "people's wider perceptions or everyday behavior" (Silverman, 1998, p. 7). For data collection, we employed semi-structured interviews to gain rich data (Myers and Newman, 2007). Such data were deemed essential for studying the complex phenomena central in our research (associations between users' goals, smartphone use, technostress, and coping). Thus, our research approach was guided by established qualitative research methodologies (Lune and Berg, 2017; Myers and Newman, 2007), where existing literature informed the interview design while allowing space for new themes, concepts, and patterns to emerge.

For seeking participants for our study, we utilized purposeful sampling (i.e. selecting participants based on pre-set criteria) by identifying interviewees who were active smartphone users and had experienced technostress (Patton, 2002). Thus, we aimed to access "information-rich cases," ensuring that the data collected was relevant to our research objectives and conducive to developing an in-depth understanding of the phenomenon under study (Patton, 2002, p. 230). In the research call, we informed potential participants that eligibility for the study required having experienced technostress. To clarify this criterion, we provided examples of technostress-related experiences (e.g. feeling exhausted from excessive social media use or struggling with disrupted concentration due to incoming notifications). This ensured that participants understood the types of experiences relevant to the study and that those who participated had meaningful insights to share. While we did not formally categorize participants based on the nature or intensity of their technostress experiences, our sampling approach ensured that all participants had encountered personally meaningful forms of technostress. As the aim of our study was to capture a rich variety of technostress experiences and coping responses grounded in everyday smartphone use, we prioritized depth of insight over broad population representation.

We collected data in three phases, and the interviews took place in 2019, 2021, and 2024–2025: 10 interviews (nine face-to-face, one remote) were conducted in 2019, 20 (all remote) were conducted in 2021, and eight interviews (all remote) were conducted in 2024–2025, totaling 38 interviews. We conducted multiple data collection phases to account for the continuously evolving nature of the studied IT, which is shaped not only by technological changes but also by shifting social and political landscapes. Additionally, these successive phases enhanced the reliability and validity of our findings (Creswell, 2007). The first author conducted all the interviews, which lasted 55 min on average. Among the 38 participants, 24 identified as women and 14 as men, aged between 22 and 41 (average 28 years old), representing diverse professions, such as project coordinator, career adviser, nurse, and masseuse. All participants were native Finnish speakers residing in Finland. They reported using their smartphones for 1–9 h daily (average 5 h) and accessing various applications, including Instagram, TikTok, and WhatsApp. Prior to our research, we contacted the university ethics committee about ethical approval for our study. Despite our research focusing

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on human participants, our research topic did not warrant an official ethical review statement, per the ethics committee. However, we ensured adherence to ethical standards throughout the research process. We ensured participants were fully informed about the purpose of the research and their right to withdraw at any time without consequences. Specifically, we obtained verbal informed consent from all participants and took care to protect their privacy, confidentiality, and security during data collection and analysis. For instance, if participants spontaneously shared sensitive information during the interviews that could have warranted an official ethical review, such excerpts were excluded from the data (e.g. discussions about participants' medical diagnoses). Additionally, we pseudonymized all data to prevent identification.

The design of our interview framework was structured around two core themes: (1) participants' smartphone use, including underlying motivations and use patterns, and (2) stress, appraisals, and coping. Each theme was informed by distinct strands of existing literature. The first theme drew on research examining why people use IT, what kinds of benefits they seek or experience through the use, and how these benefits are shaped by actual use (e.g. Gan and Li, 2018; Sundar and Limperos, 2013). This theme included questions such as "What purposes do you use your smartphone for?" and "What kinds of feelings does your smartphone use evoke?", which provided insight into various emotional and functional dimensions of smartphone use. In essence, these questions allowed us to contextualize technostress within participants' everyday smartphone use patterns. The second theme, focusing on stress, appraisals, and coping, was grounded in the transactional view of stress and coping (Folkman and Moskowitz, 2004; Lazarus and Folkman, 1984), as well as foundational technostress research (e.g. Maier *et al.*, 2015a, b; Ragu-Nathan *et al.*, 2008; Pirkkalainen *et al.*, 2019; Salo *et al.*, 2019). Questions such as "What specific smartphone activities have resulted in stressful or negative outcomes for you?" and "How did you come to realize that smartphone use was becoming burdensome?" encouraged participants to articulate how they perceived, evaluated, and experienced technostress. In addition, questions on coping (e.g. "How have you responded to the stressful or negative consequences of smartphone use?" and "How effective have those responses been?") aimed to uncover participants' emotional and behavioral strategies for managing technostress.

To better address gaps in research, we also asked more explorative questions such as "How have different stressful or negative experiences affected you and your life?" and "How do you feel about your possibilities for personally influencing the stressful or negative aspects of your use?". Although our interview framework was not explicitly designed to elicit participants' underlying goals, such goals became evident and were frequently discussed by the interviewees. Finally, as is the nature of semi-structured interviews, the interview framework remained flexible throughout. As the interviews progressed, participants introduced novel perspectives – such as stress caused by short-form video content or concerns about platform ownership – which prompted follow-up questions to deepen our understanding (Myers and Newman, 2007). Overall, our approach balanced theory-informed structure with openness to emerging insights, ensuring both alignment with established literature and sensitivity to new, underexplored findings about the topic.

During our interviews, we employed mirroring techniques by using the participants' own words to ask follow-up questions (Myers and Newman, 2007). This approach allowed us to gain more profound insights into the participants' experiences as they described them in their own terms. For instance, if participants mentioned stress, we prompted them to provide further details. In general, the interviewer's role was to actively listen and guide the interview to facilitate a deeper understanding of the participants' experiences (Myers and Newman, 2007). This was achieved through empathy and encouragement, fostering an environment in which the participants felt comfortable sharing openly. After 38 interviews, we determined that we had achieved sufficient saturation indicating that additional data would not significantly

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enhance the current level of explanation (Strauss and Corbin, 1998, p. 136). Subsequently, we proceeded with our data analysis.

Data analysis

Our work is theoretically grounded in the transactional view of stress and coping (Lazarus and Folkman, 1984). Moreover, we draw on the humanistic/instrumental goal perspective (e.g. Sarker *et al.*, 2019) to examine how individuals' goals shape their experiences of technostress and their coping responses. These frameworks, combined with other relevant research on technostress, coping, and goals, provide the foundation for our study and guide our interpretation of the data. In practice, the analysis phase began with the transcription of the interviews. Subsequently, we followed established guidelines for coding and analyzing qualitative data. The steps taken were the following: the data were systematically coded, meaning that relevant text portions were labeled; the codes were categorized based on their similarities, grouping together codes with similar characteristics; the data underlying these categories were thoroughly examined to identify emerging patterns and processes, which involved reading the data to understand the aspects represented by the identified codes and categories; the patterns identified were compared and contrasted with existing literature (Lune and Berg, 2017, p. 184). Thus, we based our analysis on established guidelines for qualitative content analysis, which was primarily data-driven but also involved iterative reflection on existing literature to contextualize and integrate our findings within extant research (Lune and Berg, 2017).

Given our primary focus on exploring coping with technostress, we systematically identified and coded all instances of coping in accordance with its definition, following the transactional view of stress (Lazarus and Folkman, 1984), in addition to later works on coping (Folkman and Moskowitz, 2004). Here, we adhered to the approach of "asking the data a specific and consistent set of questions" (Strauss, 1987, p. 30). The initial codes included *leaving the smartphone in another space*, *muting the smartphone*, and *accepting that privacy is lost*. We then identified similarities among the different coping strategies, ultimately categorizing them into three groups: *use modifying*, *settings modifying*, *and attitude modifying*. While these categories emerged from the data, they also partially align with existing research (see, e.g. Salo *et al.*, 2017). The first author primarily conducted the data analysis, while regularly discussing the process, emerging themes, and patterns with the co-authors to deepen the understanding of the associations between users' goals, technostress, and coping strategies.

We then sought to "discover the crucial patterns that can best explain the data" (Lune and Berg, 2017, p. 194). Although our interview framework was not explicitly designed to elicit participants' underlying goals, these goals emerged inductively during analysis by examining the coping excerpts. Recognizing the presence of diverse goals – particularly participants' efforts to shield these goals in response to technostress, we drew on literature that distinguishes between humanistic and instrumental goals (Sarker *et al.*, 2019) as well as on work examining goal hierarchies and structures (Austin and Vancouver, 1996; Wicker *et al.*, 1984), to interpret these observations. Here, we systematically reviewed all previously identified instances of coping with technostress, aiming to organize these observations into meaningful thematic categories through the goal-lens (Patton, 2002, p. 463). This allowed us to group similar statements into nine goal categories, each nested under the broader humanistic or instrumental label, thereby highlighting the hierarchical structure of users' goals. As we examined these categories and their associated sub-goals, we noted variations in their level of explicitness. For instance, goals related to schoolwork were typically clearly defined (e.g. completing assignments on time), whereas goals related to identity were more abstract and subjective (e.g. adhering to personal values). We therefore classified all identified goals as either explicit or implicit, interpreting these distinctions through continued analysis of the participants' narratives (Patton, 2002).

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Next, we continued pattern-seeking, aiming to understand more thoroughly how participants utilized coping from the perspective of the abstraction level of the goals hindered by technostress. In doing so, we observed that coping linked with more explicit goals tended to be dominantly anticipatory, while that associated with more implicit goals tended to be dominantly reactive. Moreover, as we explored the associations between the participants' goals, technostress, and coping, conflicts often arose. This meant that shielding certain goals, for instance, contributed to hindrances in achieving other goals. Although our analysis was grounded in the data, we leveraged prior literature in comprehending our observations. Initially, we discussed proactive coping; however, upon comparing our findings with the literature, we found that anticipatory coping better aligned with our observations. Thus, we utilized existing literature to interpret our data and contextualize our findings (Lune and Berg, 2017), facilitating integration with and contribution to existing research. At each pass, we compared new patterns with previously coded material to refine themes, ensuring that the emerging findings and propositions consistently reflected both participants' accounts and the guiding theoretical constructs. Throughout our analysis phase, we employed constant comparison to identify similarities and differences among participants' experiences (Glaser and Strauss, 1967), allowing us to refine emerging themes and ensure that our reported findings reflected common patterns. Findings reported as central in the next section were those mentioned by multiple participants, confirming our findings through triangulation (Lune and Berg, 2017).

Here, we wish to disclose that ChatGPT (versions 3.5, 4.0, 4o, and o3) has been used to aid with proofreading and editing the manuscript. Such was done by presenting the AI with sentences written by the authors that seemed ambiguous, and the AI's suggestion for re-formatting was reviewed by the first author and implemented for the parts that were deemed improved, similar to editing offered by proofreading/academic editing services. In addition, ChatGPT was used for translating the direct interview quotes from their original language into English, which we will present as evidence for our results in the following section.

Results

Here, we showcase how individuals cope with technostress by employing various strategies to shield their humanistic and instrumental goals from technostress-related hindrances. In our data, we identified three main coping strategies: use modifying, settings modifying, and attitude modifying. Each have anticipatory and reactive variants, with the selection highly influenced by the explicitness (anticipatory coping) or implicitness (reactive coping) of the goals. Furthermore, we discuss the potential conflicts between users' goals, technostress, and coping. Table 4 summarizes our study, with each column highlighting how the findings extend or refine prior research.

Coping with technostress—The humanistic goal perspective

Humanistic goals refer to aspirations that prioritize aspects such as well-being, quality of life, and individuals' ideals. Many participants cited well-being as their overarching motivation for coping with technostress. However, the concept of well-being is complex, often intertwined with more specific goals, such as engaging in enjoyable activities. Therefore, we consider well-being reflected in the various humanistic goals we discuss. In addition to the humanistic goals pursued by the participants, Table 2 outlines examples of technostress that had manifested as hindrances to their goals, along with examples of coping.

A prevalent sentiment expressed in the interviews was a distinct lack of appreciation for the time spent browsing smartphones, many describing their use as a waste of time. Beneath these narratives, the influence of technostress hindering the pursuit of meaningful lives was evident. As goals associated with meaningful life attainment, such as being happy, are often *implicit* and the emotions can emerge abruptly, the participants displayed coping that was dominantly

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Table 2. Humanistic goals, technostress, and coping

Humanistic goals	Technostress example	Coping and an example
Meaningful life attainment (experiencing happiness; having fun; avoiding time-waste) – *more implicit*	Browsing the smartphone excessively (e.g. short video feeds such as TikTok) throughout the day contributes to technostress via internal conflict, guilt, and attentional drain, manifesting as hindrances to goals associated with meaningful life attainment	*Dominant coping: reactive* *Example: Reactive use modifying.* When realizing that time is being wasted during smartphone use, ceasing the browsing and doing something else instead can reduce technostress caused by internal conflict, providing more meaningful experiences
Identity management (maintaining self-image; practicing self-acceptance; following personal values and opinions) – *more implicit*	Browsing to explore the "perfect" lives of social media influencers contribute to technostress via dysfunctional comparison behavior and issues with self-image, manifesting as hindrances to goals associated with identity management. Also, value misalignment due to hostile discourse on social media (e.g. on X) can trigger technostress that hinders personal value goals	*Dominant coping: reactive* *Example: Reactive attitude modifying.* When encountering online content that negatively affects one's self-image or personal values, reminding oneself that social media content is often not an accurate representation of reality can reduce technostress caused by dysfunctional thought patterns or comparison behavior, positively affecting one's identity
Personal interest engagement (dedicating time, motivation, and concentration for hobbies; engaging with interesting online content) – *implicit/explicit*	Browsing not interesting or useful content on the smartphone contributes to technostress via interest-mismatch and frustration, manifesting as hindrances to goals associated with personal interest engagement	*Dominant coping: none* *Example: Anticipatory/reactive use modifying.* When browsing online content, modifying use according to how interesting or useful one finds the content can reduce technostress caused by interest-mismatch, aligning better with one's personal interests
Relaxation and recovery (dedicating time and concentration for relaxation; ensuring that downtime is recovering; sleeping well) – *implicit/explicit*	Receiving constant stimuli while browsing the smartphone contributes to technostress via information overload and exhaustion, manifesting as hindrances to goals associated with relaxation and recovery	*Dominant coping: none* *Example: Anticipatory/reactive settings modifying.* When browsing smartphone during downtime, disabling notifications (either prior or during the situation) to reduce incoming stimuli can reduce technostress caused by information overload, providing grounds for increased relaxation and recovery
Social relationship maintenance (dedicating time for social relationships; concentrating during social situations) – *implicit/explicit*	Using smartphone while spending time with others contributes to technostress via overdependence and social conflicts, manifesting as hindrances to goals associated with social relationship maintenance	*Dominant coping: none* *Example: Anticipatory/reactive use modifying.* When spending time with a partner/friends/family, consciously separating oneself from the smartphone in advance or in the moment (either by choice or due to deals made with others) can reduce technostress caused by social conflicts, enhancing social relationships

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reactive in nature when encountering technostress manifesting as hindrances to said goals. This was particularly evident when participants described browsing short videos on platforms like TikTok:

> It was like, [a curse word], how have I been spending my time; this is not what I want and . . . [. . .] I realized that I don't get anything from it [TikTok] except time passing by. So, I deleted it.

From a different perspective, technostress caused by browsing social media on smartphones manifested as a hindrance to participants' goals related to their identity management, indicating that the issues with technostress extend beyond mere browsing time. Reactive use modifying was one approach used to cope with the technostress hindering such goals. More prominently, to shield their self-image, many adopted an attitude-modifying approach by trying to understand that nothing is as perfect as shown on social media:

> A lot of those who do these social media things, they [have had plastic surgery done]. Also, if someone has a professional makeup and hairstyle, you don't. So, if you have enough money to just train and eat those organic strawberries, it gives a little wrong impression. [. . .] Sometimes I feel like, "Oh my, if I looked like that." But their job is to look good. If my job were that, I could look the same way.

Also tied to users' identities and values, several participants described how changes in the landscape of certain social media platforms had increased their stress due to conflicts between their personal values and the evolving nature of the platform. As a reactive coping response, many reported discontinuing their use of the platform:

> Yeah, so I've deleted Twitter and also removed things I noticed were only bringing negativity and not really offering anything positive. I wanted to get rid of that kind of content. [. . .] The division between left and right started becoming really strong – it was mostly just hatred from both sides. I didn't really want to read that anymore.

Associated with engaging in personal interests, many participants noted that interruptions and feelings of overdependence prompted by smartphone use consistently disrupted activities such as reading, exercising, or spending time outdoors. This led to a lack of engagement in activities they truly enjoyed, thereby hindering the goals associated with personal interest engagement. Similar experiences were reported regarding browsing content on smartphones. Browsing something that is not considered very interesting can be highly frustrating due to interest-mismatch, necessitating use modifying. Overall, this underlines technostress manifesting as goal hindrances that genuinely inhibit individuals from engaging in activities they are interested in and find enjoyment from. Since such goals can be *explicit* (e.g. dedicating time for hobbies), individuals could *anticipatorily* employ coping (e.g. putting the smartphone away before doing hobbies):

> For example, when I watch a movie, I don't pick up my phone because I want to concentrate fully and understand what's happening. [. . .] Yeah, that's exactly why I don't open anything or start doing something else, because then I'd miss parts of it, and I'd be frustrated that I don't know what's going on. [. . .] If I'm on my phone, I feel like the whole experience is kind of wasted.

Moreover, many participants expressed using smartphones for relaxation. Interestingly, the majority conveyed that this often failed to yield the desired effects. The interviewees elaborated on how they anticipatorily modified their smartphone settings to prevent situations in which their relaxation could be hindered:

> It's like irritating or in a way [. . .] one doesn't really learn to calm down or somehow; it can fill all those moments, so that one easily gets used to it, and then there's that feeling of rush, even though there might not necessarily be a rush. [. . .] I have most of the notifications off, and there aren't those social media apps that give notifications.

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In addition to individual consequences, most participants underscored instances of technostress within their social relationships. Notably, nearly half of the participants discussed technostress related to smartphone use from the perspective of their romantic partnerships, highlighting the hindrances for maintaining their relationships. Since social relationship goals are often explicit (e.g. dedicating time to one's partner), the participants tended to anticipatorily cope with technostress. They primarily did so by anticipatory modifying (e.g. restriction) smartphone use before social situations, sometimes through agreements with others, highlighting collective goal shielding:

> We have rules in our family that when we are, for example, eating, we don't have phones at the table. It has been so since I was a teenager that no one browses their phones. When we are together, the phone stays away. Maybe it has stuck with me since my parents had rules about not using phones when together.

Coping with technostress—The instrumental goal perspective

Instrumental goals refer to aspirations that prioritize individuals' development, success, and security. For example, the overarching reason many participants gave for trying to cope with technostress related to productivity in various contexts. In addition to the instrumental goals pursued by the participants, Table 3 outlines examples of technostress that had manifested as hindrances to their goals, along with examples of coping.

As all the instrumental goals we observed were more explicit, anticipatory coping strategies were dominant for managing the technostress-related hindrances for participants' goals such as study efficiency and work performance. For example, most participants had recently studied or were currently studying, and they highlighted the disturbing effect of smartphones when trying to do academic work (e.g. preparing for exams). As academic work was often something the participants could prepare for, their coping tended to be anticipatory relating to such technostress experiences and the associated goal hindrances. For instance, one participant had completely stopped using his smartphone while preparing for exams. This helped him momentarily, although he did not see any long-lasting effects:

> I wouldn't say that it had any effect on my behavior; it was just an acutely chosen [laughs] course of action for that time [multiple exams coming up]. [. . .] Yeah, I didn't get a "Zen feeling" from that. You know that you're married to your phone. You can't get rid of it that easily.

Furthermore, many participants were working and encountered situations in which smartphone-related technostress manifested as hindrances to their professional goals, such as excelling at work. Typically, especially in remote work and meetings, people browsed their smartphones during work, which negatively affected their concentration. Some said that they had learned to prioritize work tasks, especially during critical situations, by, for example, flipping their smartphones so they would not see the screen or muting them, which helped them in excelling in their work:

> I've started to do so that when I'm in a customer meeting or in meetings where I have to concentrate, I mute my smartphone, and I put it in such a way that I can't see what is on the screen. I'll focus on it later.

Furthermore, our observations indicated that technostress could manifest as hindrances to mundane task maintenance, such as cleaning and other chores, often resulting from participants procrastinating uncomfortable activities by browsing their smartphones. To address such, an emphasis was placed on anticipatory use and settings modification (e.g. distancing from the device and turning off notifications):

> Even with small things, like if I try to focus on cleaning, I feel like my attention keeps getting pulled in different directions. For example, I start unloading the dishwasher, and then I notice a message

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Table 3. Instrumental goals, technostress, and coping

Instrumental goals	Technostress example	Coping and an example
Study efficiency (dedicating time, motivation, and concentration for studying; being efficient in studying; completing assignments on time; excelling in studying) – *more explicit*	Constantly checking smartphone while trying to study contributes to technostress via distraction and disturbances in concentration, manifesting as hindrances to goals associated with study efficiency	*Dominant coping: anticipatory* *Example: Anticipatory use modifying*. When having to focus on studying, separating oneself from certain services (e.g. social media) can reduce technostress caused by constant checking and distractions, increasing concentration for studying
Work performance (having motivation and concentration for working; being efficient in working; excelling in working) – *more explicit*	Receiving constant notifications on a personal smartphone at work contributes to technostress via interruptions, information overload and disturbances in concentration, manifesting as hindrances to goals associated with work performance	*Dominant coping: anticipatory* *Example: Anticipatory settings modifying*. When being at work, muting the smartphone or disabling notifications can reduce technostress caused by constant interruptions and information overload, increasing efficiency at work
Mundane task maintenance (dedicating time, motivation, and concentration for mundane tasks; being efficient in mundane tasks) – *more explicit*	Browsing the smartphone instead of completing necessary mundane tasks (such as doing chores) contributes to technostress via procrastination and annoyance, manifesting as hindrances to goals associated with mundane task maintenance	*Dominant coping: anticipatory* *Example: Anticipatory use modifying*. When planning to complete mundane tasks, completely distancing oneself from the smartphone can reduce technostress caused by procrastination, enabling the completion of the planned mundane tasks
Personal information management (maintaining information security; managing information timeliness and quality) – *more explicit*	Using smartphone applications that collect personal data (such as location) contributes to technostress via information security worries and increased anxiety, manifesting as hindrances to goals associated with personal information management; this is particularly evident in using services operated by providers perceived as lacking trustworthiness	*Dominant coping: anticipatory* *Example: Anticipatory attitude modifying*. When using smartphone applications that collect personal data (such as location), taking a neutral stance and accepting the situation can reduce technostress caused by information security worries, ensuring sufficient personal information management

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> popping up on my phone. I reply to the message, and suddenly, I realize I've ended up somewhere completely different on my phone. [. . .] And then it hits me, 45 minutes have passed since I was supposed to empty the dishwasher. [. . .] For a while now, I've been trying to reduce these distractions. I've disabled, um . . . What's the word . . . Those notifications from apps so that if I get a message, I don't see it right away. I've turned off . . . Are they called banners or notifications? Whatever they are, I've removed them so that my phone sends me as few alerts as possible.

Also emphasizing instrumental goals, several participants discussed goals pertaining to personal information management. For instance, privacy concerns related to smartphone use emerged as potential hindrances in this regard due to issues concerning data collection by certain services. Dominantly, this concern was addressed through an anticipatory approach, ensuring that only the minimum required consent was granted to various services.

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Additionally, some participants adopted a neutral stance and attitude towards the collected data:

> It is something that I am aware of and somewhat educated about, like how it is used and for what it is used, but . . . [third parties using one's information]. I don't feel like losing sleep over it. In the end, the effects of it are not too negative, in my opinion. [. . .] So I have a pretty neutral attitude towards such, and I am strongly aware of it.

In the third phase of our interviews, participants increasingly highlighted that platform ownership influences how they perceive risks related to information security and, more broadly, their sense of safety. A common perception was that platforms like TikTok were particularly malicious due to ownership concerns. However, some participants found reassurance in their TikTok use by arguing that similar issues exist across all platforms. This perspective can be interpreted as a form of anticipatory attitude modification, where users adapt their perceptions to navigate perceived risks:

> But, I mean, this whole China thing and all that . . . For me personally, I just don't know how to be afraid of my data ending up in the hands of the Chinese government. Like, I really don't care, go ahead, take whatever you want. Maybe it's just the kind of person I am, but it doesn't scare me at all. And when I think about X, Facebook, or any of those other platforms, come on, seriously, I just feel like it's the same trash in a different package. The problem exists on all of them.

Interestingly, participants who experienced hindrances to their instrumental goals, such as personal information management, often reported simultaneous disruptions to humanistic goals, such as experiencing happiness. This suggests that certain platforms may elicit dual-hindrances, simultaneously undermining multiple goal types and requiring users to engage in complex, multifaceted coping responses. These challenges become even more pronounced when users encounter conflicts between their goals, a dynamic we elaborate on next.

Conflicting goals and coping strategies

Our data revealed that conflicting goals could impede users from effectively employing coping, which necessitates goal prioritization by the users. For instance, some participants mentioned that when they modified their smartphone use (e.g. reduced use) to address interruptions, they simultaneously jeopardized their social relationship maintenance by missing out on meaningful conversations. Thus, coping does not always occur without consequences, even if the initial goal is achieved:

> I enrolled in [a school], so I have many other things to do than browse the phone all the time here. [. . .] In a way, this is [better] or you feel like you have more truly relaxing activities. [. . .] But on the other hand, you don't have as much time to talk with your [family via smartphone].

As mentioned, for many, smartphone use serves as a means to relax, particularly in the evenings. Despite some recognizing its value in relaxation, smartphone use could nevertheless disrupt their sleep. However, the perceived importance of relaxation often led individuals to tolerate certain hindrances:

> I have never tried, for example, to go to sleep in such a way that I would have a phone-free period before starting to sleep. I am aware that there is research that shows . . . that it worsens sleep quality and thus is not a good thing. But I have felt that when I use TikTok [before going to sleep], I get my mind off work stuff and such for a while.

Focusing on instrumental goals, participants who used their personal smartphones for work were especially confronted with conflicting goals, highlighting challenges with their work–life balance. Although we primarily explored personal smartphone use, for some, disentangling work- or study-related tasks from personal activities proved nearly impossible. This was especially evident among those who used social media to showcase their professional expertise. Such circumstances underscored the complexities of work–life balance, in which

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conflicting humanistic and instrumental goals, technostress and the associated coping strategies often intersect:

> And I've thought about, like, could I altogether remove certain applications from my phone? But then, I think it's difficult that I have to have them at work, and my accounts are linked there. That's a challenge: how to manage that. I've wondered if it could be pretty liberating to stop using them altogether. But yeah, it feels difficult.

Moreover, when confronted with conflicting goals, individuals attempting to cope by reducing stressors, such as distractions, inadvertently introduced new stressors, such as information overload, which could be seen as secondary technostress. This paradoxical situation often left participants torn between minimizing distractions to pursue personal interests or being social in real life and contending with the overwhelming influx of information upon re-engaging with their smartphones, thus accentuating the dilemmas inherent in coping strategies.

To conclude, each individual faces a unique set of challenges, often requiring them to prioritize conflicting goals and the associated technostress, which affects how coping strategies are employed. As we have demonstrated, navigating the challenges posed by technostress and its impact on various life goals can be daunting, given the multitude of goals intertwined with smartphone use. Table 4 provides a summary of our key research findings, propositions, and directions for confirmatory approaches.

Discussion

Research contributions

We advance the understanding of technostress and coping in three main ways. First, we extend existing research on technostress and coping by anchoring the utilization of coping strategies to the specific consequences of technostress through a goal-oriented perspective. While previous studies have examined various coping strategies, they have not linked these to specific humanistic and instrumental goals associated with IT use, despite such being central to IS research (Sarker *et al.*, 2019). By integrating insights from stress and coping research, we discuss how stress and unmet goals are associated (Folkman, 2008), and highlight technostress manifesting as goal hindrances. We argue that coping with technostress can be viewed as a mechanism of goal shielding (Bélanger *et al.*, 2013; Shah *et al.*, 2002). Whereas existing research has investigated goals and technostress centered around IT use in hospital settings (Califf, 2022) and has briefly explored humanistic and instrumental goals and coping with technostress within organizations from a presenteeism perspective (Luoma *et al.*, 2020), our study extends this work by addressing coping with a wider range of situation-specific negative consequences in personal smartphone use. For instance, technostress from using rapid short video feeds such as TikTok can manifest as a dual-hindrance, compromising humanistic goals related to being happy through meaningful engagement while simultaneously undermining instrumental goal of personal information management, prompting goal shielding through complex and multifaceted coping strategies such as modifying use, settings, and attitude (see Salo *et al.*, 2017). Also, as smartphone-related interruptions and the associated concentration issues can interfere with users' personal interests (e.g. engaging in hobbies) or mundane tasks (e.g. completing chores efficiently), individuals need to reassess and adapt their cognitions and behavior to shield these goals. In this way, we not only identify the coping strategies employed by users but also unpack the process through which technostress emerges and is managed, offering a goal-oriented explanation of how and why coping occurs.

Given that individuals' goals comprise smaller goals (Austin and Vancouver, 1996), our contribution involves identifying sub-goals for humanistic goals, such as meaningful life attainment (e.g. being happy), and instrumental goals, such as personal information management (e.g. maintaining information privacy). We uncover coping strategies for dealing with technostress manifesting as hindrances on such sub-goals, acknowledging the multidimensional and hierarchical nature of goals (Wicker *et al.*, 1984). Thus, we expand on

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Table 4. Findings, prior work and our novel insights, propositions, and directions for confirmatory approaches

Finding	Prior work and our novel insights	Propositions	Directions for confirmatory approaches
Finding 1: Coping with technostress can be seen as a form of goal shielding from the perspective of humanistic and instrumental goals	*Prior work* Coping (e.g. Folkman and Moskowitz, 2004; Lazarus and Folkman, 1984) Goal hierarchies and structures (e.g. Austin and Vancouver, 1996; Wicker *et al.*, 1984) Goal shielding (e.g. Bélanger *et al.*, 2013; Shah *et al.*, 2002) Humanistic and instrumental goals (e.g. Chatterjee *et al.*, 2021; Sarker *et al.*, 2019) *Our novel insights* Technostress can manifest as hindrances to users' humanistic and instrumental goals. For instance, technostress from using rapid short video feeds such as TikTok can manifest as a dual-hindrance: it compromises humanistic goals related to being happy through meaningful engagement while simultaneously undermining instrumental goal of personal information management. By intervening at the level of specific sub-goals – such as preserving concentration (e.g. disabling push notifications), safeguarding information security (e.g. limiting exposure), or maintaining positive affect (e.g. interpreting situations more positively) – these coping strategies illustrate the multidimensional and hierarchical nature of goals. Focusing on such concrete, situation-specific episodes brings technostress research closer to lived experience and clarifies why and how particular coping strategies are employed	P1: Coping functions as a mechanism through which individuals seek to shield their humanistic and instrumental goals from technostress-related hindrances P2: Individuals shield their overarching humanistic and instrumental goals from technostress-related hindrances by addressing them at the sub-goal level	Measuring whether specific coping strategies are perceived to help individuals live meaningful life (a humanistic goal) or maintain task efficiency (an instrumental goal) under technostress conditions Operationalizing goal hierarchies and structures to measure how coping responses relate to hindrances at the sub-goal level (e.g. hindrances to "having motivation" as a sub-goal of "work performance") to investigate how people respond to specific stressors and whether their coping specifically and effectively maps to shielding these sub-goals

(*continued*)

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Table 4. Continued

Finding	Prior work and our novel insights	Propositions	Directions for confirmatory approaches
Finding 2: Coping can differ from a temporal perspective based on the explicitness or implicitness of individuals' goals hindered by technostress	*Prior work* Coping temporality (e.g. Reuter and Schwarzer, 2012; Pirkkalainen *et al.*, 2019) Goal explicitness (e.g. Bittner, 2011) *Our novel insights* Anticipatory coping is dominant with goals that are specifically planned, more concrete, and imbued with conscious thought (i.e. more explicit goals). This is, for instance, due to users being familiar with technostress situations that could manifest as goal hindrances, placing them more in control. By contrast, reactive coping is dominant with goals that lack explicit planning, are more abstract, and are influenced by unconscious thinking (i.e. more implicit goals). This is, for instance, due to users suddenly realizing the goal hindrances in the moment	P3: Explicit goals tend to foster anticipatory coping due to conscious planning and familiarity with potential hindrances P4: Implicit goals tend to elicit reactive coping as hindrances are recognized more spontaneously	Measuring both the level of abstraction of individuals' goals and their use of anticipatory versus reactive coping strategies to clarify whether different types of goals systematically and generally predict the temporal nature and effectiveness of the employed coping strategies

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Table 4. Continued

Finding	Prior work and our novel insights	Propositions	Directions for confirmatory approaches
Finding 3: Individuals' goals, technostress-related hindrances, and coping can be in conflict	*Prior work* Conflicting goals/goal synergy (e.g. Emmons, 1986; Sarker *et al.*, 2019; Verkuil *et al.*, 2015) Conflicts and technostress (e.g. Benlian, 2020; Tams *et al.*, 2020) Coping effectiveness (e.g. Gaudioso *et al.*, 2017; Lin *et al.*, 2021) *Our novel insights* Technostress-related coping can create conflicts among competing goals, because shielding one goal may compromise another. For instance, temporarily abandoning the smartphone in order to protect study efficiency (instrumental) inadvertently may weaken ability to maintain social relationships (humanistic). A similar trade-off can emerge if one withdraws from social media on value grounds: the decision can safeguard humanistic goals tied to personal identity, but it jeopardizes instrumental goals such as staying up to date. Thus, goal shielding carries a cost that may manifest as secondary technostress, introducing new goal hindrances. Achieving synergy therefore depends on goal prioritization or alignment so the resolution of one hindrance does not escalate another	P5: Technostress-related coping can generate conflicts between competing goals, where efforts to shield one goal may compromise others, leading to secondary technostress P6: Resolving these conflicts requires goal prioritization or alignment to mitigate additional technostress	Measuring perceived goal conflict (e.g. between efficiency and social relationship maintenance) and examining its relationship with technostress outcomes to clarify whether coping strategies that prioritize one goal over another lead to increased strain, reduced satisfaction, or secondary technostress Measuring individuals' ability to prioritize or align competing goals and assessing their association with technostress outcomes to clarify whether goal coordination reduces the likelihood of additional or recurring stress following coping efforts

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studies focusing on general strains (such as exhaustion and fatigue) as adverse outcomes of technostress by delineating technostress manifesting as hindrances to specific goals, and strategies to cope with them. Our research brings technostress investigation closer to concrete, situation-specific, and experience-centric consequences and provides explanations on how to deal with them.

Second, recognizing that individuals' goals can be explicit or implicit (Bittner, 2011), we explain coping with technostress-related goal hindrances from such a perspective. Our findings indicate that when goals are more explicit (e.g. instrumental goal of completing study assignments on time), individuals tend to have greater perceived control over the situation, and their coping strategies lean toward being anticipatory (i.e. anticipatory coping; Folkman and Lazarus, 1985; Reuter and Schwarzer, 2012). Conversely, when goals are more implicit (e.g. humanistic goal of being happy), users typically cope reactively and impulsively in the moment (i.e. reactive coping; Pirkkalainen *et al.*, 2019; Reuter and Schwarzer, 2012). As all the instrumental goals we observed were explicit, anticipatory coping strategies were dominant with such goals. With humanistic goals being both explicit and implicit, the coping strategies varied. However, it is worth noting that reactive coping may also be helpful for explicit goals and that anticipatory coping can benefit implicit ones, although these were not central in our data. This pattern supports our novel insight that anticipatory coping tends to dominate when clearly articulated, explicit goals are threatened, whereas reactive coping prevails when more implicit, abstract goals are hindered. In doing so, we extend the current understanding of why coping unfolds differently across temporal dimensions (Pirkkalainen *et al.*, 2019).

Furthermore, we demonstrate how the main coping strategies observed have anticipatory and reactive variants. Notably, we did not find a significant pattern of reactively modifying settings in our data. This may be attributed to the possibility that the participants had prior experience with technostress without reactively modifying their settings in the moment. However, these experiences could lead them to learn how to anticipatorily modify settings in the future, as different types of coping strategies can influence one another (Pirkkalainen *et al.*, 2019). The key takeaway is that when individuals specifically know what they aspire to do or be, it might be easier to anticipate the possible goal hindrances technostress could manifest as. Our findings about anticipatory coping and explicit goals also resonate with existing research on mindfulness and technostress mitigation, as mindfulness involves cultivating awareness and deliberate attention, which parallels the anticipatory mindset we observed (Ioannou *et al.*, 2024; Pflügner *et al.*, 2021). Based on our observations, future research could utilize the mindfulness lens to deepen the process of how anticipatory coping takes place to shield explicit goals from technostress-related goal hindrances. Moreover, explicit goal setting can also be understood as a form of anticipatory coping, further reinforcing the connection between coping and goals in this context. This perspective aligns with research suggesting that individuals who are aware of how situations impact them and recognize potential hindrances are better equipped to engage in self-regulation and preventive coping strategies (Aspinwall and Taylor, 1997). Understanding anticipatory coping through a goal-setting lens provides a more structured way to examine why some individuals engage in effective coping while others struggle to mitigate technostress.

Third, we extend the work on the dynamics of coping, technostress, goals in response to the call to investigate the synergy and conflicts between humanistic and instrumental goals associated with IT use (Sarker *et al.*, 2019). Our analysis revealed more instances of conflict than synergy, aligning with findings from the organizational context (Sarker *et al.*, 2019). Notably, humanistic goals such as fostering social relationships and seeking relaxation often collided with instrumental goals related to work and academic pursuits, complicating the coping process. This tension is closely linked to work–life balance due to IT-mediated personal lives interfering with work demands, and vice versa (Benlian, 2020; Burleson and Greenbaum, 2019; Tams *et al.*, 2020). For example, our observations highlighted instances in which individuals took temporary breaks from smartphone use to prioritize instrumental goals related

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to studying, which inadvertently led to challenges in maintaining social connections that largely depended on smartphone interactions, which could be viewed as secondary technostress. Although reducing smartphone use might improve study efficiency, it can also trigger feelings of unhappiness due to reduced real-time social interaction, illustrating a fundamental conflict between instrumental and humanistic goals. We also observed value-based withdrawal from services such as X: while this protected humanistic goals tied to personal identity, it compromised instrumental goals like staying informed, at times generating secondary technostress. By highlighting how competing strivings can be a source of stress (Emmons, 1986), we deepen the understanding of barriers to technostress mitigation (Salo *et al.*, 2022). Moreover, our findings build upon prior research that distinguishes between beneficial and adversarial coping strategies (Gaudioso *et al.*, 2017; Lin *et al.*, 2021). By introducing explicit goal conflicts into this discussion, we offer a conceptually distinct lens on coping adaptiveness – one that reframes earlier dichotomies by situating coping within a broader web of competing humanistic and instrumental goals. This perspective underscores the need to evaluate technostress mitigations not just by their effect on a single goal (e.g. productivity), but by how they influence the balance across users' intertwined personal, emotional, and functional aspirations.

Furthermore, smaller daily stressors could harm individuals' explicit (e.g. meeting a deadline at work) and more implicit goals (e.g. experiencing happiness) (Verkuil *et al.*, 2015), and specific instrumental goals can also affect the achievement of abstract humanistic goals, highlighting the need for synergy between goals of different nature and abstraction from the multidimensional hierarchical perspective of goals. Overall, the presence of conflicting goals necessitates that individuals make prioritizations that involve weighing the positive and negative impacts of the coping strategies associated with their goal shielding. Even though reaching for specific goals can act as a trigger that pushes users toward positive change associated with smartphone-related technostress, the changes can negatively affect other goals, even leading to additional stress.

Practical implications

By conceptualizing technostress as hindrances to humanistic and instrumental goals and framing coping as a form of goal shielding, we provide a foundation for guiding both behavioral change and the development of digital interventions that help users and service providers mitigate technostress more effectively. First, we observed that users often consider changing their smartphone habits but fail to act on these intentions. Highlighting specific sub-goal hindrances and offering coping options can help users identify small, concrete behavioral strategies – such as distancing from the device, disabling notifications, or limiting content exposure – that support broader goals and reduce technostress. Second, as technostress frequently disrupts sub-goals tied to broader humanistic or instrumental aspirations, digital services should help users identify which goals are at risk and offer tailored coping opportunities. In parallel, individuals should strive for goal synergy by intentionally prioritizing among goals, especially when pursuing one may hinder another. To support this, digital services could offer features such as scheduled reflection check-ins (e.g. pop-up questions asking whether current use aligns with user goals) or visualizations of time spent across goal domains (e.g. work, social, health). Context-aware tools like app timers could also detect excessive scrolling during times typically reserved for focused work or family, prompting users to take breaks or mute distracting apps to help realign behavior with their goals. Finally, as several participants raised concerns about the role of service providers in exacerbating technostress, our findings highlight the need for platforms to assume greater responsibility in supporting users' goal alignment and digital well-being. Beyond promoting engagement, services should include mechanisms that help users manage overload, recognize value misalignments, and regain a sense of control. This could involve clearer customization options, transparency about algorithmic content delivery, or features that enable users to set boundaries based on personal

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priorities rather than default system incentives. Time-restriction features reflect early efforts in this direction: for example, Douyin's limits for users under 14 in China, which restrict use to 40 min per day and prohibit access between 10 p.m. and 6 a.m. (Dent, 2021). Aligning service design with users' goal structures could help prevent situations in which "IT might facilitate the development of a dehumanized and dystopian society" (Sarker *et al.*, 2019, p. 696).

Limitations and future research

Our study has certain limitations. First, we based our underlying idea on using IT to reach goals in an organizational context (Sarker *et al.*, 2019). Although we have demonstrated that such issues could be relevant in personal IT use, expanding ideas to new contexts in an exploratory nature always poses potential limitations, which we attempted to alleviate by being transparent about our approach. Second, the concept of goals poses some limitations regarding ambiguity in assessing whether a goal is explicit or implicit. Additionally, users' different humanistic and instrumental goals are connected via synergy and conflicts; thus, their categorization is also not entirely unambiguous. However, we attempted to be rigorous in analyzing our data (e.g. using triangulation) to support our arguments. Third, it is worth noting, as we discussed anticipatory and reactive coping, that separating them might not be straightforward, as anticipatory coping could also be preceded by something that has happened before, thus reflecting a reaction depending on the point of observation. This could be an interesting future research avenue: how do the temporal dimensions of coping interplay in the context of coping with technostress-related goal hindrances? Fourth, although we employed purposeful sampling to recruit participants with technostress experiences, we did not classify them based on specific stress patterns or levels of severity. This may limit the generalizability of our findings, as individuals experiencing technostress in different ways or to varying degrees might employ different coping strategies. Fifth, we relied on self-reported data, meaning that the participants had to recall past experiences concerning their smartphone use. Consequently, memory bias may be present. Although we took precautions to mitigate such challenges (e.g. giving participants enough time to think before answering), there are always possible inaccuracies when self-reporting and recalling past events. Finally, although we strengthened the study by collecting additional interview data, the cohorts were sampled independently, and the data remains cross-sectional. This constrains our ability to draw longitudinal inferences about how technostress experiences, coping responses, and goal-related dynamics evolve over time.

We also identified several promising avenues for future research. First, more detailed investigations are needed into situations where coping strategies unintentionally generate new technostress through alternative routes. For example, future work could examine barriers that obstruct effective technostress mitigation (Salo *et al.*, 2022) or lead to unintended consequences. Second, many participants noted that technostress was reduced when their personal goals remained unobstructed, suggesting that successful goal attainment may act as a buffer against technostress. Further research could explore how different types of goals influence individuals' stress experiences in the context of smartphone use. Third, it would be valuable to investigate how various situational factors – such as life transitions or shifting responsibilities – enable or constrain the use of specific coping strategies aimed at supporting instrumental and humanistic goals. Fourth, a natural extension of our study would be to conduct longitudinal research that offers more rigorous insight into whether specific coping strategies provide sustained relief, generate secondary technostress, or trigger goal re-prioritization over time. For instance, a diary study could capture within-person changes in technostress experiences, goal conflicts, and coping efforts as the technological landscape continues to evolve. It would also offer a valuable lens for examining how individual circumstances and broader life dynamics shape these processes over time. Finally, given that IT use has traditionally been driven by instrumental goals – even in systems designed to serve humanistic aims, such as digital welfare services (Weeger *et al.*, 2021) – future research should investigate how IT can better support both goal types. This includes designing systems that not

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only enable the pursuit of humanistic and instrumental goals but also minimize the risk that fulfilling one goal will hinder the other.

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