

# **Tired from Tech: Knowledge Workers' Experiences Coping with Digital Exhaustion**

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## **Introduction**

Burnout in the workplace has received increasing attention over the last few decades with heightened concern emerging during the COVID-19 pandemic (Maslach et al., 2001). According to a 2022 American Psychological Association (APA) report, work-related burnout and stress are at an all-time high. A survey of 1,501 U.S. workers revealed that 36% of respondents reported cognitive weariness, 32% reported emotional exhaustion, and 44% reported physical fatigue—a 38% increase since 2019 (Abramson, 2022). Fortunately, scholars and managers recognize this problematic trend and are increasing efforts to find effective strategies to reduce workplace exhaustion. However, the research on burnout has yielded inconsistent results, with workplace interventions reducing exhaustion in some cases but not others (Maslach and Leiter, 2016).

One possible explanation for these conflicting findings and an aspect of burnout that has been relatively underexplored is the relationship between technology and exhaustion. While digital tools can enhance productivity and collaboration, much less is known about the unintended effects due to the accumulated use of digital technologies (Trittin-Ulbrich et al., 2021). Moreover, the existing literature on technology-induced stress focuses primarily on digital tools used in work contexts, neglecting non-work-related technologies' role in contributing to or relieving overall feelings of exhaustion (Kim and Wright, 2007; Moore, 2000). Understanding how digital technologies contribute to burnout and how employees respond to combat these adverse effects is imperative to ensure worker well-being in an ever-changing and increasingly digital work environment.

To explore the technological aspect of burnout, we use the concept of digital exhaustion, defined as *exhaustion resulting from psychological and physiological strain due to the sustained and cumulative use of multiple digital tools in both work and non-work contexts*. Similar to but distinct from work exhaustion, digital exhaustion is one component of the larger burnout construct explicitly focused on the strain/fatigue that results from prolonged use of digital technologies.

## **Literature Review**

Over the past few decades, several scholars have begun investigating the challenges facing individuals whose lives have become inundated with the consistent use of digital technologies. For example, scholars have investigated the phenomena of technostress which is defined as “[the] inability to cope or deal with ICTs in a healthy manner” (Ayyagari et al., 2011). The studies on technostress emphasize the psychological strain experienced by individuals that negatively impacts them cognitively, emotionally, and mentally (Atanasoff & Venable, 2017; Tarafdar et al., 2007, 2015). As a recent literature review pointed out, most technostress studies focus on emotional

ramifications (Nisafani et al., 2020). Yet, fewer technostress studies elaborate on how individuals may also experience technostress in their physical bodies (Riedl, 2012).

Outside of the literature on technostress, other scholars have examined the negative effects of specific types of technology and demonstrated that ramifications are experienced psychologically and physiologically. For example, recent studies on Zoom fatigue show how extended use of video-conferencing technologies results in mental and physical tiredness, especially in one's eyes (Bailenson, 2021; Fauville et al., 2021). Other studies in the occupational health field also emphasize that extended computer use can result in fatigue in the physical body, such as the neck and shoulders (Blatter & Bongers, 2002; Jensen et al., 2002). However, these studies focus on piecemeal technologies. Thus, our conceptualization of *digital exhaustion* encapsulates the physiological and psychological dimensions of stress, strain, and fatigue when using myriad digital technologies inside and outside work contexts.

Additionally, the proposed solutions in prior research that address digital exhaustion have mixed results. Most studies suggest interventions such as introducing changes to the environment, a technology's design, or an individual's framing of their situation (Atanasoff and Venable, 2017; Bellotti et al., 2005). For example, studies suggest increasing a person's knowledge of a technology through training can increase self-efficacy (Salanova et al., 2000; Sami & Pangannaiah, 2006). Yet, these interventions do not always work or have small positive effects, and the reasons for why are not thoroughly understood (Sarabadani et al., 2018). Therefore, it remains an empirical puzzle as to why some interventions work and others do not. This leads to our two research questions: **(RQ1)** *What actions do workers take to address digital exhaustion?* **(RQ2)** *When and why are these actions successful or not?*

Based on the findings from this study, we propose that one reason for the conflicting findings in the technology and burnout literature is the lack of attention paid to the role of perceived autonomy in combating the adverse psychological and physiological effects of prolonged digital tool use. According to Ryan and Deci's (1985, 2000) self-determination theory, autonomy – the perception of choice and volition in one's actions – is one of three basic human psychological needs (along with competence and relatedness). When an individual satisfies all three needs, they experience increased motivation and well-being. Contrastingly, when they feel their needs are thwarted, individuals experience exhaustion and degradation of well-being. Although self-determination theory has been the focus of numerous other disciplines, scholars focused on interventions to ameliorate the adverse effects of technology use have paid far less attention to the concept (Van den Broeck et al., 2016). Our findings suggest that the degree to which individuals experience perceived autonomy surrounding their use of digital tools plays a significant role in either abating or exacerbating their experience of digital exhaustion.

## **Methodological Approach**

The core of this study's data comes from extensive interviews with 65 unique knowledge workers collected by a team of researchers. Knowledge work differs from other forms of labor because knowledge work entails tasks that require the handling, interpreting, and transmitting of

information and data. Therefore, knowledge workers must use a range of ICTs that operate on computers, mobile phones, tablets, and other devices to handle the data and information their work requires. Thus, we focus this study solely on individuals employed in knowledge-based work because their work is inextricably linked to using digital tools.

We followed Spradley's (2016) and Kvale and Brinkmann's (2009) interview approach by developing a semi-structured interview protocol. Our goal for the protocol was to create questions that would elicit systemically comparable data that illuminated our informants' views of their social world. Our protocol contained four main sections. First, we sought definitions from our informants related to *digital exhaustion*, including how they understood this feeling compared to other negative feelings like *stress*, *burnout*, and *fatigue*. Next, we guided informants to describe their work, the nature of the digital tools they use, and how they felt about the tools they used both in work and non-work contexts. In the third section, we asked informants to reflect on their strategies for using their digital tools and why they partook in those strategies. Finally, in the last section, we asked informants about their digital tool use outcomes. Our interviews lasted from 30 minutes to 75 minutes.

We are conducting data analysis in three main stages using a grounded theory technique of comparing and contrasting data from each informant to illuminate emergent patterns and develop connections between these patterns (Strauss and Corbin, 1998). In the first stage, we open code interview transcripts using the language of our informants but allow the categorical sections of our interview protocol to guide this process. In the second stage, we axial code by placing our open codes into generic categories. In this stage, we plan to uncover patterns indicating differences in how informants characterize their digital exhaustion and differences in their strategies. Lastly, given the inductive nature of this study, we incorporate a stage of multiple iterations of coding to determine and reveal relations between the emergent patterns (Glaser and Strauss, 1967).

## **Preliminary Findings**

Based on preliminary data analysis of 35 interviews, we found that all informants experienced digital exhaustion to varying degrees. We identified that digital exhaustion arises because individuals experience technologies as infringing on their perceived autonomy – that is, “the experience of choice and volition in one’s behavior and personal authentic endorsement of one’s activities and actions” (Milyavskaya and Koestner, 2011, p. 387). As described by one informant when talking about internal messaging tools at his company, he recognizes the tension between whether he controls his digital tools or if they control him:

“We control it, and we configure it, and populate it. But we do kind of feel it rules us in a way I think, I think the project platform is where you can almost lose sight of the fact that, you know, we have authority over it. It's telling us what we need to be doing is a sort of strange symmetry to our relationship with it. It’s very demanding of us.”

To cope with digital exhaustion, our informants described engaging in actions that directly applied to how they used their digital tools or indirectly addressed other aspects of their situation shaped by their use of digital tools. For example, many informants described changing the settings of their digital tools or explicitly disconnecting from their devices. In comparison, indirect actions include setting boundaries with colleagues or engaging in self-care and pleasurable, stress-relieving activities. In either case, when individuals perform actions to increase their perceived autonomy, this can mitigate their experience of digital exhaustion.

However, many individuals experienced amplified forms of digital exhaustion because they described how their actions were ineffective and frustrated efforts at exercising autonomy. Often, the lack of effective actions was due to factors beyond the individual's control, like lack of organizational support, power imbalances, and interdependence of work. When informants described their actions as ineffective, this led to decreased perceptions of autonomy, further exacerbating digital exhaustion. For many of these individuals, having their coping actions constantly thwarted eventually resulted in the sense of resignation and disengagement.

Summarily, we conceptualize the digital exhaustion–autonomy relationship like how a gardener deals with gophers. Digital exhaustion, like a colony of hungry gophers, challenges a person's perceived autonomy. In the case of a garden, individuals can either directly address their pest problem by trapping the gophers or attempt other solutions like repellants or fencing. Similarly, in the case of digital exhaustion, individuals can engage in actions aimed directly at their digital technologies or indirectly at non-technology aspects of their lives. In either case, when individuals perceive their actions as effective, they can cope with their situations, alleviating their frustrations. Contrastingly, when individuals experience their actions as ineffective, whether in a garden or their experiences with digital technologies, they become overwhelmed and start to believe that they have no control over their problems.

## Implications

The findings of our study point to how the combination of *all* digital tools a person uses contributes to their sense of psychological and physiological exhaustion through the pathway of perceived autonomy. Moreover, the strategies for coping with digital exhaustion focus on increasing one's sense of perceived autonomy and, therefore, can be technologically and non-technologically based. Practically, our findings are helpful to managers who want to enable their workforces to deal with the ubiquity of digital technologies. For example, our findings suggest that contextual and organizational factors not specifically related to digital technology may significantly influence how employees experience digital exhaustion. Therefore, managers can offset these negative impacts from employees' extensive use of digital technologies by increasing workers' sense of autonomy by respecting employee boundaries or authorizing workers to control other aspects of their workflow, schedule, or interactions.

## References

- Abramson, A. (2022). *Burnout and stress are everywhere*. APA.
- Atanasoff, L., and Venable, M. A. (2017). Technostress: Implications for Adults in the Workforce. *The*

- Career Development Quarterly*, 65(4), 326–338.
- Ayyagari, R., Grover, V., and Purvis, R. (2011). Technostress: Technological Antecedents and Implications. *MIS Quarterly*, 35(4), 831–858.
- Bailenson, J. N. (2021). Nonverbal Overload: A Theoretical Argument for the Causes of Zoom Fatigue. *Technology, Mind, and Behavior*, 2(1).
- Bellotti, V., Ducheneaut, N., Howard, M., Smith, I., and Grinter, R. (2005). Quality Versus Quantity: E-Mail-Centric Task Management and Its Relation With Overload. *Human-Computer Interaction*, 20(1), 89–138.
- Blatter, B. M., and Bongers, P. M. (2002). Duration of computer use and mouse use in relation to musculoskeletal disorders of neck or upper limb. *International Journal of Industrial Ergonomics*, 30(4), 295–306. [https://doi.org/10.1016/S0169-8141\(02\)00132-4](https://doi.org/10.1016/S0169-8141(02)00132-4)
- Fauville, G., Luo, M., Queiroz, A. C. M., Bailenson, J. N., and Hancock, J. (2021). Zoom Exhaustion & Fatigue Scale. *Computers in Human Behavior Reports*, 4, 100119.
- Glaser, B. G., and Strauss, A. L. (1967). *The Discovery of Grounded Theory: Strategies for Qualitative Research*. Aldine.
- Jensen, C., Rycholt, C. U., Burr, H., Villadsen, E., and Christensen, H. (2002). Work-related psychosocial, physical and individual factors associated with musculoskeletal symptoms in computer users. *Work & Stress*, 16(2), 107–120.
- Kim, S., and Wright, B. E. (2007). IT Employee Work Exhaustion: Toward an Integrated Model of Antecedents and Consequences. *Review of Public Personnel Administration*, 27(2), 147–170.
- Maslach, C., and Leiter, M. P. (2016). Burnout. In *Stress: Concepts, Cognition, Emotion, and Behavior* (pp. 351–357). Academic Press. <https://doi.org/10.1016/B978-0-12-800951-2.00044-3>
- Maslach, C., Schaufeli, W. B., and Leiter, M. P. (2001). Job Burnout. *Annual Review of Psychology*, 52(1), 397–422.
- Moore, J. E. (2000). One Road to Turnover: An Examination of Work Exhaustion in Technology Professionals. *MIS Quarterly*, 24(1), 141–168. <https://doi.org/10.2307/3250982>
- Nisafani, A. S., Kiely, G., and Mahony, C. (2020). Workers' technostress: A review of its causes, strains, inhibitors, and impacts. *Journal of Decision Systems*, 29(sup1), 243–258.
- Riedl, R. (2012). On the biology of technostress: Literature review and research agenda. *ACM SIGMIS Database: The DATABASE for Advances in Information Systems*, 44(1), 18–55.
- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 55, 68–78.
- Salanova, M., Grau, R. M., Cifre, E., and Llorens, S. (2000). Computer training, frequency of usage and burnout: The moderating role of computer self-efficacy. *Computers in Human Behavior*, 16(6), 611–624.
- Sami, L. K., and Pangannaiah, N. B. (2006). “Technostress” A literature survey on the effect of information technology on library users. *Library Review*, 55(7), 429–439.
- Sarabadani, J., Carter, M., and Compeau, D. (2018). 10 Years of Research on Technostress Creators and Inhibitors: Synthesis and Critique. *AMCIS 2018 Proceedings*. <https://aisel.aisnet.org/amcis2018/AdoptionDiff/Presentations/23>
- Strauss, A., and Corbin, J. (1998). *Basics of qualitative research: Techniques and procedures for developing grounded theory*, 2nd ed (pp. xiii, 312). Sage Publications, Inc.
- Tarafdar, M., Pullins, E. Bolman., and Ragu-Nathan, T. S. (2015). Technostress: Negative effect on performance and possible mitigations. *Information Systems Journal*, 25(2), 103–132.
- Tarafdar, M., Tu, Q., Ragu-Nathan, B. S., and Ragu-Nathan, T. S. (2007). The Impact of Technostress on Role Stress and Productivity. *Journal of Management Information Systems*, 24(1), 301–328.
- Trittin-Ulrich, H., Scherer, A. G., Munro, I., and Whelan, G. (2021). Exploring the dark and unexpected sides of digitalization: Toward a critical agenda. *Organization*, 28(1), 8–25.
- Van den Broeck, A., Ferris, D. L., Chang, C.-H., and Rosen, C. C. (2016). A Review of Self-Determination Theory's Basic Psychological Needs at Work. *Journal of Management*, 42(5), 1195–1229.