Under Pressure: Contextualizing Workplace Stress Towards User-Centered Interventions

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Abstract

Stress is a pervasive challenge that significantly impacts worker health and well-being. Workplace stress is driven by various factors, ranging from organizational changes to poor workplace design. Although individual stress management strategies have been shown to be effective, current interventions often overlook personal and contextual factors shaping stress experiences. In this study, we conducted semi-structured interviews with eight office workers to gain a deeper understanding of their personal experiences with workplace stress. Our analysis reveals key stress triggers, coping mechanisms, and reflections on past stressful events. We highlight the multifaceted and individualized nature of workplace stress, emphasizing the importance of intervention timing, modality, and recognizing that stress is not solely a negative experience but can also have positive effects. Our findings provide actionable insights for the design of user-centered stress management solutions more attuned to the needs of office workers.

CCS Concepts

• **Human-centered computing** → **Empirical studies in HCI**.

Keywords

Workplace stress, well-being, user-centered design, interventions, elicitation study

1 Introduction

Coined as the "modern day epidemic" [28], work-related stress is a prevalent issue that extends beyond the workplace. In the US alone, 83% of workers experience work-related stress, and 120,000 die each year from complications related to workplace stress [48]. Work-related stress not only affects worker well-being and productivity but also frequently extends into their home life [47, 61].

Stress also has significant ramifications on mental health, increasing the risk for anxiety and depression, and contributing to disrupted sleep and fatigue [21]. Workplace stress can be driven by a variety a factors, from organizational changes and work commitments [38–41], to poor indoor environmental quality (IEQ) conditions [14, 52, 57, 58]. Consequently, there has been a growing interest in providing workers with effective stress management strategies.

To effectively address workplace stress, individual stress management strategies (e.g., cognitive-behavior interventions, breaks, physical activity, etc.) are an effective approach [17, 51]. With the advancement of multimodal sensing [10, 52] and machine learning [13], there has been a growing interest within the Human-Computer Interaction (HCI) community to develop and design workplace stress management interventions. While some interventions [22] have positive effects on workplace stress by extension, our focus, however, is on interventions directly tailored to the physical workplace context. Such interventions leverage multimodal sensing (physiological/behavioral data from wearables, keyboards, and mice) [3, 4, 10, 49, 55], Just-in-Time Adaptive Interventions (JITAIs) [15, 25, 36, 54], to detect and help workers reduce their stress. The integration of these interventions with workplace stress theories [31, 32, 44] allow us to shape the interventions to the workers' needs. However, the effectiveness of these interventions can be influenced by personal factors such as demographics and individual stress experiences, aspects that are sometimes overlooked in current research. While prior HCI studies have explored the role of personal factors in workplace well-being (e.g., technological implications of cultural differences in perceptions of workplace norms [2], and speculative design addressing the tensions between home and office work with remote/hybrid work arrangements [12]), these factors are not always directly considered when designing stress management interventions.

In this study, we aim to further contextualize stress in the modern workplace space. Through a set of semi-structured interviews with eight office workers, we gain rich insights into their personal experiences with stress. We explore stress triggers, remediation techniques and coping mechanisms, as well as reflections on past stressful events. We highlight that worker stress is inherently multifaceted and worker-specific. We also discuss the value of intangible interfaces integrated with workplace design, the importance of intervention timing and modalities, and the dual-nature of stress which can sometimes be beneficial to workers. This work provides insights into the future of workplace stress management and how we can design more effective and user-centered interventions.

2 Background

In this section, we first explore workplace stressors, and we then review interventions for managing workplace stress.

2.1 Stressors in the workplace

Workplace stress remains a critical concern within organizational psychology and occupational health research. Specifically, office workers face unique stressors tied to the psychosocial and physical contexts of their roles. Stress in office environments arises from a combination of organizational and interpersonal factors (e.g., workload, role ambiguity, management issues), individual-level moderators (e.g., coping mechanisms), and environmental conditions (e.g., workspace design, noise, lighting) [9, 14, 16, 23, 26, 35, 46, 52, 57, 58]. Psychosocial stressors are one of the main contributors to workplace stress. These include high workloads and time pressure [9, 16], job insecurity and effort-reward imbalances [8], organizational culture shifts and inadequate managerial or social support [8, 9]. Alongside psychosocial dimensions, environmental stressors also have a significant impact on worker stress. Office design [35], noise [14, 52, 58], lighting [57], and overcrowding [23] have been found to exacerbate stress. Furthermore, rapidly growing technological advancements and perpetual connectivity – often referred to as technostress – have also been associated with increasing workplace stress [9, 60]. These insights highlight the complex nature of workplace stress, showing that it results from a combination of factors rather than a single cause.

2.2 Workplace stress interventions

Workplace stress can be managed through a variety of strategies. Individual management strategies are regarded as most effective in the modern workplace [17, 51]. This recognition has spurred extensive research in personal informatics and HCI to develop tools aimed at reducing worker stress [24]. Most of these solutions rely on web-based and desktop-embedded [25, 53, 59] or touchscreen-based personal interfaces [1]. While the overarching goal of managing stress is consistent, the methods vary. Some approaches focus on helping users reflect on their stress and prepare for high-pressure situations [34], while others emphasize mindfulness exercises [59] or suggest tailored interventions via a digital personal desktop assistant [25] our through wearable technologies [1].

The current landscape of workplace stress interventions reveals several limitations. First, these strategies often rely on active user participation and visual interactions. These interventions might not be suited for all workers or scenarios – they can ultimately increase extraneous cognitive load [56] and aggravate already stressful situations. Second, the balance eustress-distress [33] is often disregarded when designing these interventions, thus overlooking the potential to promote healthier work habits. Third, most of the research focusing on active interventions aims at reducing existing stress (e.g., prompting to take breaks, therapy-based approaches) often neglects the diverse range of stressors and experiences in the workplace that could inform more effective preventive measures. We emphasize the need for qualitative, context-driven studies to better understand workplace stress and enhance the design of stress management interventions.

3 Methods

To explore how office workers experience stress in the workplace, we conducted elicitation interviews with eight participants. These individuals were previously involved in a longitudinal study focused on detecting and mapping workplace stress. Our interviews served as a follow-up to the original study and took place after participants had completed their participation in the longitudinal research. During the interviews, participants were asked to recall specific stressful events they experienced within the past few months. All procedures were reviewed and approved by our University's Institutional Review Board (IRB).

This study is the continuation of a broader research initiative where multimodal data was gathered from 15 participants over a 4-month period. We collected the participants' physiological data using a FitBit watch, their levels of social interaction using an audio recording device, as well as continuous IEQ measurements of their office spaces. Throughout the data collection, we also captured the participants' perceived physical and mental health symptoms, stress, mood, and productivity levels, using semi-random momentary ecological assessments (EMAs) (i.e., short questionnaires).

We defined "office workers" as individuals who primarily perform their work at an assigned desk (excluding hot-desking roles). Participants were recruited based on their psychosocial job characteristics using the Job Content Questionnaire (JCQ) [29] and eligibility criteria, which included being over 18 years old at the time of the study. All participants were affiliated with the University of Southern California (USC). Out of 15 individuals who completed the longitudinal data collection, two were not affiliated with USC anymore, leaving us with 13 eligible participants for interviews. A total of eight participants responded to our solicitations. Participant demographics and psychosocial job characteristics are detailed in Table 1.

We used a semi-structured interview format designed to capture participants' experiences of workplace stress. Specifically, our approach draws on the "story interview method", a story-based design technique grounded in HCI theory. Story interviews are particularly valuable for capturing rich, detailed information about user experiences, enabling researchers to derive actionable insights for design [37]. Initially, participants were asked to recall specific stressful events that they had encountered in the past few months. The participants were then asked to walk us through a stressful situation that they had recently experienced. To better understand their experiences, we asked three focused questions: (1) What led them to feel stressed? (2) Did they take any actions to manage or reduce their stress? (3) Did they share their feelings or experiences with others? Participants were encouraged to elaborate further as they walked us through their experiences. Interview questionnaire is detailed in Appendix B. The interview data were analyzed using thematic analysis [11] to identify patterns and themes in participants' descriptions of workplace stress.

4 Findings

In this section, we report on our insights from the interviews and contextualize stress in the workplace.

4.1 Main stressors

We highlight the main causes of stress in the workplace reported by our participants.

4.1.1 Organizational constraints. Most participants experienced stress due to competing demands within their organizations. Organizational pressures often came from multiple stakeholders requiring attention, with limited resources or time to meet all demands. Two participants specifically discussed hierarchical dynamics as their main stressor. These dynamics can take the form of jarring disruptions, as P8 reported that her supervisor is *"always constantly on the go and busy [...] and likes to be able to get answers immediately and quickly,"* or unreasonable work demands as P3 highlighted, *"[They've] basically given me 2 days to create 10 years of data out of nothing."* Organizational stress, however, does not always come from the higher-ups. For example, when describing a recent stressful event, P7 noted a lack of training resources as the main source of stress, stating that her undertrained colleague *"walked into the room and just pressed all the buttons, ruining the microphones and the Zoom setup,"* quickly escalating the participant's stress levels.

4.1.2 Workplace design. Three participants specifically cited the physical workplace as both a source of stress and a source of relief. Lack of access to natural light were highlighted as stressors for two participants. For example, while giving an online lecture, P2 reported, *"if I'd had a window, I would have been able to look out and like, breathe. And I was just feeling so tied to the virtual space of the workstation because [the students] are online,"* which ultimately worsened her already stressful experience *"I think it just sort of compounded it."* In contrast, other participants took advantage of their workplace design to increase their comfort and manage their stress. P4 stated, *"[I] tend to keep my [partition] windows closed in the office so I'm very isolated"* as a means to minimize disruptions and unnecessary stress, which highlights the importance of individual preferences in managing stress.

4.1.3 External factors. The impact of external factors (i.e., other than work commitments and workplace design) were mixed. Two participants specifically talked about external factors affecting their stress. When discussing her personal experience, P2 highlighted that personal issues spilled over into the workplace, affecting her stress, *"Yeah, and just like life things right now. At the time my husband was still looking for a job. He's been unemployed. And so you know how things in your life can be like."* On the other hand, another participant reported that his personal life does not intrude into his work life. P1 stated that he is able to manage his time and commitments both for work- and non-work-related issues, *"I feel like I know I'm going to get somewhat of a small break. So other commitments outside of work, family, or whatever else I think I was on a good level of managing it."*

4.2 Stress remediation strategies

We discuss the various techniques used by office workers to manage their stress.

4.2.1 Physical and mental breaks. The vast majority of participants (six out of eight) reported taking breaks to manage their stress. These pauses took different forms. Some participants opted for breaks involving physical activity to dissociate themselves from the stressful task at hand (usually associated with their workplace). For example, P7 highlighted that her office location made it convenient for her to go outside for a break: *"our office is across the street from the marina, and I just went outside for a walk. It's a 20-minute walk around Marina del Rey."* On the other hand, P2 discussed purposefully walking outside despite lacking access to a dedicated walking area. She stated, *"I walked out to my car and then walked back,"* echoed by how she usually manages her stress, *"I'm always trying to walk away from my desk. I need to get something I need to print something, and so I'll walk. I'll get water. I'll go to the bathroom."*

Other participants decided to take mental breaks instead, shifting their workload from the stressful task at hand to something cognitively less demanding. For instance, P1 reported that taking on a personal task for some time helped him manage his stress: *"I think I went online to check just personal emails since it was the holidays and you know, kind of just like reaching out to people. I think that was like my 10-15 min breather."* Similarly, while preparing for a foreseeable stressful work task, P6 stated, *"I allow[ed] myself 30 min to relax and slowly set up whatever I need[ed] to set up."*

4.2.2 A mixed outlook on sharing stressful experiences. Five participants also reported that communicating around their stressful experiences helped them better manage their stress. Sharing among colleagues seemed to be the most accessible way to process and let go of these events. For example, P2 noted, *"connecting with other people is really helpful. Even if it's just seeing them and go ask questions, it's helpful."* Similarly, P6 shared, *"I did share with my coworker how I felt. [...] And he was very reassuring, because he's also experienced it. We both have similar duties in our work titles."*

However, workplace dynamics can make it difficult for some to openly share their experiences. While P7 had a positive experience communicating with her supervisor, saying, *"I talked to her, I calmed down and she agreed that we're not going to put her on the rotation anymore. My stress was immediately lowered because I felt heard,"* others faced challenges. For instance, P6 and P8 expressed hesitation sharing their feelings with their supervisors. P6 admitted, *"I don't want to. I didn't want to express it to [my supervisor],"* while P8 explained, *"I'm not getting past the whole title."*

4.2.3 Environmental factors. Some of the stress management strategies reported by our participants are not grounded in psychological or organizational research. Instead, they incorporate environmental factors to help alleviate stress. One participant specifically mentioned using sound cues to help cope with his stress. In addition to physical breaks, P4 stated, *"I listen to music while I am working"* while at the office. While working from home, this participant relied on another source of aural stimulation. P4 reported, *"I'll turn on the TV in the background, something that I like, a TV show that I've already watched before."* Additionally, P2 also reported that she would benefit from changing her visual scenery by working close to a window, as discussed in Section 4.1.2.

4.3 Impacts of stress and self-reflections

Finally, we report on the different impacts of stress in the workplace and worker self-reflections about these events.

4.3.1 Emotional and physical responses. Participants navigated a spectrum of intense and challenging emotions during their experiences, often feeling frustration, hopelessness, and self-doubt. Organizational stress was a prominent theme, with participants expressing frustration over time constraints and misaligned priorities. P6 voiced this clearly, stating, *"It sucks that I have to sacrifice my time or make my schedule work for an event that's not related to me,"* while P3 felt *"frustrated and annoyed"* at the *"lack of respect for my time"* and the unrealistic nature of some requests. Similarly, P5 described a sense of dread, saying, *"I was a little worried because I had already submitted the budget,"* indicating how administrative pressures and management issues amplified her stress.

Participants also frequently expressed feeling a lack of control when stressed, escalating to feeling incapacitated at times. For instance, some felt a lack of control. P7 stated, *"I guess it was also my feeling of helplessness, looking bad in front of other people, unable to help control the situation."* This sentiment of disarray was echoed by P2, who explained, *"I am scrambling for answers instead of being in control."* As a result of their stress, some participants voiced their inability to efficiently manage tasks. For instance, P8 specifically discussed how highly stressful events would make it challenging to go through her normal day of work. She highlighted, *"I can't find the file because I'm stressed out, I'm not able to communicate because I'm stressed out, I'm not able to focus because I'm stressed out,"* which later escalated, *"my heart beats really fast, I start to stutter, I start fidgeting with my hands, my hands get sweaty, and I get into panic mode."* These accounts highlight how stress can impair both cognitive and physical functioning, compounding the difficulty of navigating already demanding circumstances, and having lasting effects on worker well-being.

Feelings of inadequacy were another significant theme, as participants grappled with self-doubt and a fear of failure. P2 admitted when asked how she felt about her experience, *"and it looks like I don't know what I'm doing. [...] So frustrated and kind of ashamed,"* reflecting a deep insecurity about her performance. P8 echoed this sentiment, describing themselves as feeling *"incompetent"* and that they were *"letting the division down."* These feelings sometimes lead to isolating behaviors to avoid showing vulnerability. P8 stated, *"I stay in my office just because I don't want to be emotional when I go outside"* as she fears students, faculty, and staff members would come to her for her questions because of her role.

Finally, emotional exhaustion arose as a recurring experience. P7 felt *"emotionally drained"* and noted, *"I guess I was more stressed because she [her supervisor] has done this numerous times,"* highlighting the toll of repeated stressors and the place of organizational stress in the workplace. P4 described a sense of hopelessness, saying, *"I felt so hopeless,"* which was compounded by his deep-seated fear of disappointing others: *"I hate letting people down."* Together, these themes underscore the heavy emotional burden participants carried due to persistent stress from external demands and internal pressures in the workplace.

4.3.2 Introspection and self-reflections. Despite strong emotional reactions, these experiences allowed participants to further reflect on their stress at work. Several participants expressed a positive outlook when revisiting these moments, even if they were difficult at the time. For instance, P4 shared, *"while that was rather negative, looking back at it, it's a positive experience."* Similarly, P6 highlighted a consistent effort to frame challenges positively, *"I like to take things as a positive experience, usually because I'm always learning something about myself, even if it's a bad time."* These reflections underscore significant personal growth and reveal that stress, while challenging, can serve as a powerful driver for self-development.

Participation in the data collection process prior to this study appeared to catalyze self-awareness and introspection, though effects on daily life varied. For instance, P1 found the data collection impactful but questioned its long-term influence. He specifically highlighted that interaction with his data in the moment was helpful, but these self-reflections do not exist anymore, stating, *"I got a chance to do feedback and all those things which were really helpful [at the time] [...] But since it was so far removed in a way that I don't really feel it anymore. The recollection of all that I did during the study [n.b., longitudinal data collection] was a daily, relevant thing."* Meanwhile other participants reported clearer benefits still holding true long after the data collection process was finished. For example, P4 found that his participation made him *"more mindful of my stress,"* while P6 highlighted long-term benefits, stating, *"I'm more self aware of what my triggers could be for stress."*

Increased self-awareness often translated into actionable changes. For instance, P8 shared a transformative realization, stating, *"some of the questions that were asked [during the data collection process] really made me think of how I view myself as a manager [...] before I would bottle it up [...] I took it home and would yell at my kids, my husband, at the cat, at the dog, get stressed out."* She attributed the longitudinal data collection's introspective EMAs to helping her reflect on stressful experiences and manage her stress more effectively. Similarly, P2 discussed deeper insights into the source of her stress while participating in the data collection phase, allowing her to reflect on how her experience stress: *"some introspection on what's really causing the stress in this event."* While some participants found accessing and reflecting on their stress data helpful, others noted that being stressed distracted them and made it challenging from engaging with their data effectively. For example, preoccupied by completing a stressful task at hand, P4 explained that he couldn't think to reflect on his stress data: *"I wasn't looking at my Fitbit to see what my heart rate was at the time."*

5 Discussion

Workplace stress is a growing concern, with technological advances to support stress management. However, much of this research overlooks the unique needs and experiences of office workers, whose stress is shaped by a variety of complex factors. This study aims to explore these experiences, providing insights into designing more user-centered solutions that effectively address the varied needs of office workers, enabling better workplace stress management.

Personalizing Interventions. Our participants' stress experiences varied notably depending on psychological job demands and demographic factors such as gender and age. Higher-psychological-demand roles often reported heightened organizational stress tied to unrealistic deadlines and administrative hurdles. Conversely, those with lower psychological demands indicated more personal-life

spillover, suggesting different expectations in one's job role does not necessarily reduce overall stress but may shift its locus. To some extent, we also note differences in stress experiences across genders. For instance, two female participants specifically mentioned how inadequate workspace design increased their stress. Our findings suggest stress management interventions may better adapt to specific demand profiles, as suggested by prior research [51]. For instance, workers with high psychological-demand roles (particularly administrative workers) might benefit from interventions tied to their work commitments and space, whereas workers with lower psychological-demand roles could benefit from on-demand interventions that can be used outside the workspace. Similarly, female workers might benefit more from interventions tied to environmental-related stressors than male workers. While our limited sample cannot yield generalized conclusions, our findings suggest that stress management interventions can be tailored to different worker job roles, work demands, and demographics. We further discuss implications for designing stress management technologies in the following sections.

Social Barriers, Hierarchies, and Trust in Stress Disclosure. Participants' experiences highlight the importance of social connections in mitigating workplace stress, aligning with prior evidence that informal interactions among colleagues can enhance well-being [6]. Yet, our findings also underscore structural barriers that constrain open disclosure. For instance, hierarchical relationships can discourage employees (particularly administrative workers) from acknowledging vulnerabilities. In some cases, even the physical openness of shared offices can increase apprehension about visibly engaging with stress-management tools. These observations mirror concerns about workplace "surveillance" practices, wherein employees worry that data on their stress levels could be misread or misused, ultimately reducing trust rather than fostering well-being [20, 30]. Making individual metrics publicly visible can induce self-censorship, as workers focus on avoiding negative perceptions rather than seeking genuine support [18, 30]. These challenges highlight the tension between helpful transparency and fear of stigma. Rather than simply calling for better privacy safeguards, our insights illustrate specific design levers for mitigating the risks of open disclosure. We observed that different job titles and supervisory relationships either facilitated or impeded stress discussions. This points to a design opportunity for discreet or anonymous approaches that promote help-seeking without risking repercussions. For example, employees with more demanding roles and those with higher privacy-needs could benefit from conversational agents with data anonymization to share stress-related challenges.

Expanding Stress Management Interventions to the Physical Environment. While organizational factors remain a prominent source of workplace stress [9], workplace design and operations surfaced as a compelling avenue for mitigating these stressors. Workers' accounts illustrate that workplace environmental demands are prevalent [5]. Poor IEQ factors such as noise [14, 52, 58], lighting [57], and indoor air quality [14, 57], have been shown to contribute significantly to worker stress. Scholars highlight that IEQ interventions can support worker stress management, particularly when supported by multimodal sensing (e.g., capturing environmental data in tandem with wearable or usage metrics) [62, 63]. Yet, the

lived experiences of office workers exposed to these interventions remain underexplored, particularly concerning how they interact with interpersonal dynamics and work processes. Notably, some participants actively leverage their existing workplace environments to manage stress, hinting at the opportunity for adaptive, context-sensitive solutions. Recent work in robotics further underscores the efficacy of adaptive workspaces for tackling organizational (e.g., disruptions) and environmental (e.g., acoustic) constraints [42, 43]. Future research could therefore investigate not only the reactive nature of environmental interventions (e.g., changing environmental conditions when users are stressed) but also preventive measures (e.g., changing environmental conditions and creating cues to encourage breaks before stress accumulates). In doing so, it is crucial to assess how various dimensions (e.g., workplace layout (open-plan vs. closed-office), job role demands, and organizational culture, intervention modalities, tangibility) mediate the effectiveness of these interventions.

Worker Context and Cognitive Load. Another important avenue in stress management interventions is the interplay between stress and cognitive load. Many of our participants described feeling paralyzed by stress, largely due to distractions that align with what cognitive load theory describes as *extraneous load* (e.g., interruptions) [45, 56]. These observations highlight how stressors - particularly those that demand immediate attention - can conflict with the modality of an intervention (e.g., visual prompts or auditory alerts), thereby reducing its effectiveness or even exacerbating stress [45]. In addition to increasing cognitive load, stress can persist over time, making workers less responsive to interventions at best, or compound the negative effects of stress at worst. Although some research has explored the efficacy of timing interventions [15, 25, 36, 54], our findings suggest that stress remains disabling long after the precipitating event. Future work should investigate how to optimize stress management intervention timing and modalities to minimize extraneous cognitive load and avoid contributing additional, unnecessary stress.

Designing for Self-Reflection and Long-Term Engagement. Finally, our interviews brought to light the importance of self-reflection in worker stress management. Despite the passive data collection nature of our study, participants specifically discussed how regularly reporting their mental and physical health data positively affected them. These findings are consistent with current research in personal informatics. While reflecting on personal data can be challenging [7, 50], recent research highlights the benefits of self-reflection on worker well-being [27] and health [19]. However, this study also revealed that the long-term effects of reflecting on past personal data were mixed. Future research should therefore explore how self-reflection technologies and sustained engagement with personal data influence the effectiveness of workplace stress management interventions, over time.

All in all, we highlight key takeaways to support future user-centered stress management systems:

(1) **Stress is complex and heavily worker-dependent.** Office workers face a variety of stressors from organizational, interpersonal, and individual sources. Workers with high job demands might benefit from interventions seamlessly

integrated into their daily workflow, while those with lower demands may prefer flexible, on-demand solutions that can be used outside the workspace.

(2) **Stress management interventions cannot be bound to digital interfaces alone.** The adaptive workplace can be leveraged for stress management, providing an additional layer of physical and intangible interventions. For example, changes in workplace design (i.e., space, partitions) and operations (i.e., noise, lighting) can be used to help workers manage their stress.

(3) **Timing and modalities of interventions matter.** Stress can linger long after a triggering event, and stress management interventions can introduce additional extraneous cognitive load. Poorly timed or overly intrusive interventions may worsen stress.

(4) **Stress is not always negative.** Designing interventions that reduce distress while promoting positive stress (i.e., eustress) can improve worker well-being.

(5) **Improve data awareness and self-reflection.** Reflecting on personal data is an effective way to manage and reduce stress. Interventions should be designed to promote and encourage sustained self-reflection, over time.

Our study presents several limitations. First, the small sample size limits the generality of our findings as the perspectives captured may not represent broader workplace trends. Second, our participants were all affiliated with USC, which may omit stressors and coping mechanisms unique to workers from other industries or professional contexts. Factors such as organizational culture, job roles, and industry-specific dynamics likely influence how stress manifests and is managed. We partially address this limitation by having recruited workers with different work and stress demands, as well as varied demographics (Table 1). Additionally, our study relied on retrospective accounts where participants reflected on past stressful experiences. While this approach provided valuable insights, richer findings could emerge by exploring how office workers reflect and engage with their actual data.

6 Conclusion

In this study, we contextualized stress in the workplace leveraging insights from semi-structured interviews. This work sheds light on the multifaceted nature of workplace stress through diverse office worker experiences. Our findings highlight the complexity and interplay of workplace stressors, and how they shape worker stress. We emphasize the need to leverage environmental and contextual factors within the workplace itself for stress management interventions, the critical role of timing and modality in implementing these interventions, and the benefits of self-reflection on personal data. Additionally, we highlight the dual nature of stress—not only as a challenge but also as a catalyst for growth. Researchers can use these insights to design more user-centered and effective stress management interventions.

Acknowledgments

References

[1] Shashank Ahire, Benjamin Simon, and Michael Rohs. 2024. WorkFit: Designing Proactive Voice Assistance for the Health and Well-Being of Knowledge Workers. In *Proceedings of the 6th ACM Conference on Conversational User Interfaces (CUI '24)*. Association for Computing Machinery, New York, NY, USA, 1–14. doi:10.1145/3640794.3665561

[2] Wataru Akahori, Naomi Yamashita, Jack Jamieson, Momoko Nakatani, Ryo Hashimoto, and Masahiro Watanabe. 2024. The Impact of Social Norms on Hybrid Workers' Well-Being: A Cross-Cultural Comparison of Japan and the United States. In *Proceedings of the 2024 CHI Conference on Human Factors in Computing Systems (CHI '24)*. Association for Computing Machinery, New York, NY, USA, 1–19. doi:10.1145/3613904.3641928

[3] Thelma Androutsou, Spyridon Angelopoulos, Evangelos Hristoforou, George K. Matsopoulos, and Dimitrios D. Koutsouris. 2023. A Multisensor System Embedded in a Computer Mouse for Occupational Stress Detection. *Biosensors* 13, 1 (Jan. 2023), 10. doi:10.3390/bios13010010 Number: 1 Publisher: Multidisciplinary Digital Publishing Institute.

[4] Thelma Androutsou, Spyridon Angelopoulos, Ioannis Kouris, Evangelos Hristoforou, and Dimitrios Koutsouris. 2021. A smart computer mouse with biometric sensors for unobtrusive office work-related stress monitoring. In *2021 43rd Annual International Conference of the IEEE Engineering in Medicine & Biology Society (EMBC)*. Institute of Electrical and Electronics Engineers, New York, NY, USA, 7256–7259. doi:10.1109/EMBC46164.2021.9630602 ISSN: 2694-0604.

[5] Mohamad Awada, Burcin Becerik-Gerber, Ruying Liu, Mirmahdi Seyedrezaei, Zheng Lu, Matheos Xenakis, Gale Lucas, Shawn C. Roll, and Shrikanth Narayanan. 2023. Ten questions concerning the impact of environmental stress on office workers. *Building and Environment* 229 (Feb. 2023), 109964. doi:10.1016/j.buildenv.2022.109964

[6] Vanessa Begemann, Lisa Handke, and Nale Lehmann-Willenbrock. 2024. Enabling and constraining factors of remote informal communication: a sociotechnical systems perspective. *Journal of Computer-Mediated Communication* 29, 5 (Sept. 2024), zmae008. doi:10.1093/jcmc/zmae008

[7] Marit Bentvelzen, Jasmin Niess, Mikołaj P. Woźniak, and Paweł W. Woźniak. 2021. The Development and Validation of the Technology-Supported Reflection Inventory. In *Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems*. ACM, Yokohama Japan, 1–8. doi:10.1145/3411764.3445673

[8] Kamaldeep Bhui, Sokratis Dinos, Magdalena Galant-Miecznikowska, Bertine de Jongh, and Stephen Stansfeld. 2016. Perceptions of work stress causes and effective interventions in employees working in public, private and non-governmental organisations: a qualitative study. *BJPsych Bulletin* 40, 6 (Dec. 2016), 318–325. doi:10.1192/pb.bp.115.050823

[9] Larissa Bolliger, Junoš Lukan, Elena Colman, Leen Boersma, Mitja Luštrek, Dirk De Bacquer, and Els Clays. 2022. Sources of Occupational Stress among Office Workers—A Focus Group Study. *International Journal of Environmental Research and Public Health* 19, 3 (Jan. 2022), 1075. doi:10.3390/ijerph19031075 Number: 3 Publisher: Multidisciplinary Digital Publishing Institute.

[10] Brandon M. Booth, Hana Vrzakova, Stephen M. Mattingly, Gonzalo J. Martinez, Louis Faust, and Sidney K. D'Mello. 2022. Toward Robust Stress Prediction in the Age of Wearables: Modeling Perceived Stress in a Longitudinal Study With Information Workers. *IEEE Transactions on Affective Computing* 13, 4 (Oct. 2022), 2201–2217. doi:10.1109/TAFFC.2022.3188006 Conference Name: IEEE Transactions on Affective Computing.

[11] Virginia Braun and Victoria Clarke. 2006. Using thematic analysis in psychology. *Qualitative Research in Psychology* 3, 2 (Jan. 2006), 77–101. doi:10.1191/1478088706qp063oa

[12] Janghee Cho, Dasom Choi, Junnan Yu, and Stephen Voida. 2024. Reinforcing and Reclaiming The Home: Co-speculating Future Technologies to Support Remote and Hybrid Work. In *Proceedings of the 2024 CHI Conference on Human Factors in Computing Systems (CHI '24)*. Association for Computing Machinery, New York, NY, USA, 1–28. doi:10.1145/3613904.3642381

[13] Wencke Chodan, Silvio Krause, Mario A. Meza-Cuevas, Martin Kadner, Jan Rockstroh, Carsten König, Mario Aehnelt, Bodo Urban, and Gerald Bieber. 2020. The

SEBA system: a novel approach for assessing psychological stress continuously at the workplace. In *Proceedings of the 6th International Workshop on Sensor-based Activity Recognition and Interaction (iWOAR '19)*. Association for Computing Machinery, New York, NY, USA, 1–6. doi:10.1145/3361684.3361694

[14] Yoorim Choi, Minjung Kim, and Chungyoon Chun. 2015. Measurement of occupants' stress based on electroencephalograms (EEG) in twelve combined environments. *Building and Environment* 88 (June 2015), 65–72. doi:10.1016/j.buildenv.2014.10.003

[15] Shanice Clarke, Luis G. Jaimes, and Miguel A. Labrador. 2017. mStress: A mobile recommender system for just-in-time interventions for stress. In *2017 14th IEEE Annual Consumer Communications & Networking Conference (CCNC)*. Institute of Electrical and Electronics Engineers, New York, NY, USA, 1–5. doi:10.1109/CCNC.2017.8015367 ISSN: 2331-9860.

[16] Thomas W. Colligan and Eileen M. Higgins. 2006. Workplace Stress: Etiology and Consequences. *Journal of Workplace Behavioral Health* 21, 2 (July 2006), 89–97. doi:10.1300/J490v21n02_07 Publisher: Routledge _eprint: https://doi.org/10.1300/J490v21n02_07.

[17] Cary L. Cooper and Sue Cartwright. 1997. An intervention strategy for workplace stress. *Journal of Psychosomatic Research* 43, 1 (July 1997), 7–16. doi:10.1016/S0022-3999(96)00392-3

[18] Vedant Das Swain, Lan Gao, Abhirup Mondal, Gregory D. Abowd, and Munmun De Choudhury. 2024. Sensible and Sensitive AI for Worker Wellbeing: Factors that Inform Adoption and Resistance for Information Workers. In *Proceedings of the 2024 CHI Conference on Human Factors in Computing Systems (CHI '24)*. Association for Computing Machinery, New York, NY, USA, 1–30. doi:10.1145/3613904.3642716

[19] Daniel A. Epstein, Clara Caldeira, Mayara Costa Figueiredo, Xi Lu, Lucas M. Silva, Lucretia Williams, Jong Ho Lee, Qingyang Li, Simran Ahuja, Qiuer Chen, Payam Dowlatyari, Craig Hilby, Sazeda Sultana, Elizabeth V. Eikey, and Yunan Chen. 2020. Mapping and Taking Stock of the Personal Informatics Literature. *Proc. ACM Interact. Mob. Wearable Ubiquitous Technol.* 4, 4 (Dec. 2020), 126:1–126:38. doi:10.1145/3432231

[20] Paul Glavin, Alex Bierman, and Scott Schieman. 2024. Private Eyes, They See Your Every Move: Workplace Surveillance and Worker Well-Being. *Social Currents* 11, 4 (Aug. 2024), 327–345. doi:10.1177/23294965241228874

[21] TG Guilliams and L Edwards. 2010. Chronic stress and the HPA axis: clinical assessment and therapeutic considerations, The Standard 9 (2)(2010) 1–12.

[22] Luke Haliburton, Natalia Bartłomiejczyk, Albrecht Schmidt, Paweł W. Woźniak, and Jasmin Niess. 2023. The Walking Talking Stick: Understanding Automated Note-Taking in Walking Meetings. In *Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems (CHI '23)*. Association for Computing Machinery, New York, NY, USA, 1–16. doi:10.1145/3544548.3580986

[23] B. Herbig, A. Schneider, and D. Nowak. 2016. Does office space occupation matter? The role of the number of persons per enclosed office space, psychosocial work characteristics, and environmental satisfaction in the physical and mental health of employees. *Indoor Air* 26, 5 (2016), 755–767. doi:10.1111/ina.12263 _eprint: https://onlinelibrary.wiley.com/doi/pdf/10.1111/ina.12263.

[24] Blake Anthony Hickey, Taryn Chalmers, Phillip Newton, Chin-Teng Lin, David Sibbritt, Craig S. McLachlan, Roderick Clifton-Bligh, John Morley, and Sara Lal. 2021. Smart Devices and Wearable Technologies to Detect and Monitor Mental Health Conditions and Stress: A Systematic Review. *Sensors* 21, 10 (Jan. 2021), 3461. doi:10.3390/s21103461 Number: 10 Publisher: Multidisciplinary Digital Publishing Institute.

[25] Esther Howe, Jina Suh, Mehrab Bin Morshed, Daniel McDuff, Kael Rowan, Javier Hernandez, Marah Ihab Abdin, Gonzalo Ramos, Tracy Tran, and Mary P Czerwinski. 2022. Design of Digital Workplace Stress-Reduction Intervention Systems: Effects of Intervention Type and Timing. In *Proceedings of the 2022 CHI Conference on Human Factors in Computing Systems (CHI '22)*. Association for Computing Machinery, New York, NY, USA, 1–16. doi:10.1145/3491102.3502027

[26] Kyung Ja June, Eun Suk Choi, and Mi-Jin Park. 2013. Effect of Psychosocial Work Environment and Self-efficacy on Mental Health of Office Workers. *Korean Journal of Occupational Health Nursing* 22, 3 (2013), 228–239. doi:10.5807/kjohn.2013.22.3.228 Publisher: Korean Academic Society of Occupational Health Nursing.

[27] Matthew Jörke, Yasaman S. Sefidgar, Talie Massachi, Jina Suh, and Gonzalo Ramos. 2023. Pearl: A Technology Probe for Machine-Assisted Reflection on Personal Data. In *Proceedings of the 28th International Conference on Intelligent User Interfaces (IUI '23)*. Association for Computing Machinery, New York, NY, USA, 902–918. doi:10.1145/3581641.3584054

[28] Madhu Kalia. 2002. Assessing the economic impact of stress[mdash]The modern day hidden epidemic. *Metabolism - Clinical and Experimental* 51, 6 (June 2002), 49–53. doi:10.1053/meta.2002.33193 Publisher: Elsevier.

[29] Robert Karasek, Chantal Brisson, Norito Kawakami, Irene Houtman, Paulien Bongers, and Benjamin Amick. 1998. The Job Content Questionnaire (JCQ): An instrument for internationally comparative assessments of psychosocial job characteristics. *Journal of Occupational Health Psychology* 3, 4 (1998), 322–355. doi:10.1037/1076-8998.3.4.322 Place: US Publisher: Educational Publishing Foundation.

[30] Anna Kawakami, Shreya Chowdhary, Shamsi T. Iqbal, Q. Vera Liao, Alexandra Olteanu, Jina Suh, and Koustuv Saha. 2023. Sensing Wellbeing in the Workplace, Why and For Whom? Envisioning Impacts with Organizational Stakeholders. *Proc. ACM Hum.-Comput. Interact.* 7, CSCW2 (Oct. 2023), 358:1–358:33. doi:10.1145/3610207

[31] Saskia Koldijk, Wessel Kraaij, and Mark A. Neerincx. 2016. Deriving Requirements for Pervasive Well-Being Technology From Work Stress and Intervention Theory: Framework and Case Study. *JMIR mHealth and uHealth* 4, 3 (July 2016), e5341. doi:10.2196/mhealth.5341 Company: JMIR mHealth and uHealth Distributor: JMIR mHealth and uHealth Institution: JMIR mHealth and uHealth Label: JMIR mHealth and uHealth Publisher: JMIR Publications Inc., Toronto, Canada.

[32] T. Kowatsch, F. Wahle, A. Filler, F. Kehr, D. Volland, S. Haug, G. Jenny, G. Bauer, and E. Fleisch. 2015. Towards Short-term Detection of Job Strain in Knowledge Workers with a Minimal-invasive Information System Service: Theoretical Foundation and Experimental Design. In *European Conference on Information Systems*. Association for Information Systems, Atlanta, GA, USA, 1–12. https://www.semanticscholar.org/paper/Towards-Short-term-Detection-of-Job-Strain-in-with-Ko

[33] Mark Le Fevre, Jonathan Matheny, and Gregory S. Kolt. 2003. Eustress, distress, and interpretation in occupational stress. *Journal of Managerial Psychology* 18, 7 (Jan. 2003), 726–744. doi:10.1108/02683940310502412 Publisher: MCB UP Ltd.

[34] Kwangyoung Lee, Hyewon Cho, Kobiljon Toshnazarov, Nematjon Narziev, So Young Rhim, Kyungsik Han, YoungTae Noh, and Hwajung Hong. 2020. Toward Future-Centric Personal Informatics: Expecting Stressful Events and Preparing Personalized Interventions in Stress Management. In *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems (CHI '20)*. Association for Computing Machinery, New York, NY, USA, 1–13. doi:10.1145/3313831.3376475

[35] Casey M. Lindberg, Karthik Srinivasan, Brian Gilligan, Javad Razjouyan, Hyoki Lee, Bijan Najafi, Kelli J. Canada, Matthias R. Mehl, Faiz Currim, Sudha Ram, Melissa M. Lunden, Judith H. Heerwagen, Kevin Kampschroer, and Esther M. Sternberg. 2018. Effects of office workstation type on physical activity and stress. *Occupational and Environmental Medicine* 75, 10 (Oct. 2018), 689–695. doi:10.1136/oemed-2018-105077 Publisher: BMJ Publishing Group Ltd Section: Workplace.

[36] Mitja Luštrek, Junoš Lukan, Larissa Bolliger, Emelien Lauwerier, and Els Clays. 2023. Designing an Intervention against Occupational Stress Based on Ubiquitous Stress and Context Detection. In *Adjunct Proceedings of the 2023 ACM International Joint Conference on Pervasive and Ubiquitous Computing & the 2023 ACM International Symposium on Wearable Computing (UbiComp/ISWC '23 Adjunct)*. Association for Computing Machinery, New York, NY, USA, 606–610. doi:10.1145/3594739.3611326

[37] Wendy E. Mackay. 2023. *DOIT: The Design of Interactive Things*. Institut national de recherche en sciences et technologies du numérique, Le Chesnay-Rocquencourt, France. https://hal.science/hal-04440366

[38] Gloria Mark, Shamsi Iqbal, and Mary Czerwinski. 2017. How blocking distractions affects workplace focus and productivity. In *Proceedings of the 2017 ACM International Joint Conference on Pervasive and Ubiquitous Computing and Proceedings of the 2017 ACM International Symposium on Wearable Computers (UbiComp '17)*. Association for Computing Machinery, New York, NY, USA, 928–934. doi:10.1145/3123024.3124558

[39] Gloria Mark, Shamsi T. Iqbal, Mary Czerwinski, Paul Johns, Akane Sano, and Yuliya Lutchyn. 2016. Email Duration, Batching and Self-interruption: Patterns of Email Use on Productivity and Stress. In *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems (CHI '16)*. Association for Computing Machinery, New York, NY, USA, 1717–1728. doi:10.1145/2858036.2858262

[40] Gloria Mark, Yiran Wang, and Melissa Niiya. 2014. Stress and multitasking in everyday college life: an empirical study of online activity. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '14)*. Association for Computing Machinery, New York, NY, USA, 41–50. doi:10.1145/2556288.2557361

[41] Daniel McDuff, Eunice Jun, Kael Rowan, and Mary Czerwinski. 2021. Longitudinal Observational Evidence of the Impact of Emotion Regulation Strategies on Affective Expression. *IEEE Transactions on Affective Computing* 12, 3 (July 2021), 636–647. doi:10.1109/TAFFC.2019.2961912 Conference Name: IEEE Transactions on Affective Computing.

[42] Binh Vinh Duc Nguyen, Adalberto L. Simeone, and Andrew Vande Moere. 2021. Exploring an Architectural Framework for Human-Building Interaction via a Semi-Immersive Cross-Reality Methodology. In *Proceedings of the 2021 ACM/IEEE International Conference on Human-Robot Interaction (HRI '21)*. Association for Computing Machinery, New York, NY, USA, 252–261. doi:10.1145/3434073.3444643

[43] Binh Vinh Duc Nguyen and Andrew Vande Moere. 2024. The Adaptive Architectural Layout: How the Control of a Semi-Autonomous Mobile Robotic Partition was Shared to Mediate the Environmental Demands and Resources of an Open-Plan Office. In *Proceedings of the 2024 CHI Conference on Human Factors in Computing Systems (CHI '24)*. Association for Computing Machinery, New York, NY, USA, 1–20. doi:10.1145/3613904.3642465

[44] Patricia Nixon, David Daniel Ebert, Leif Boß, Peter Angerer, Nico Dragano, and Dirk Lehr. 2022. The Efficacy of a Web-Based Stress Management Intervention for Employees Experiencing Adverse Working Conditions and Occupational Self-efficacy as a Mediator: Randomized Controlled Trial. *Journal of Medical Internet Research* 24, 10 (Oct. 2022), e40488. doi:10.2196/40488 Company: Journal of Medical Internet Research Distributor: Journal of Medical Internet Research Institution: Journal of Medical Internet Research Label: Journal of Medical Internet Research Publisher: JMIR Publications Inc., Toronto, Canada.

[45] Don Norman. 2013. *The Design of Everyday Things: Revised and Expanded Edition*. Basic Books, New York, NY, USA. Google-Books-ID: nVQPAAAAQBAJ.

[46] Hirbod Norouzianpour. 2020. Architectural Interventions to Mitigate Occupational Stress Among Office Workers. *Enquiry The ARCC Journal for Architectural Research* 17, 2 (Dec. 2020), 21–40. doi:10.17831/enq:arcc.v16i2.1069 Number: 2.

[47] The American Institute of Stress. 2025. WORKPLACE STRESS. https://www.stress.org/workplace-stress/

[48] OSHA. n.d.. Workplace Stress - Overview | Occupational Safety and Health Administration. https://www.osha.gov/workplace-stress

[49] Lucia Pepa, Antonio Sabatelli, Lucio Ciabattoni, Andrea Monteriù, Fabrizio Lamberti, and Lia Morra. 2021. Stress Detection in Computer Users From Keyboard and Mouse Dynamics. *IEEE Transactions on Consumer Electronics* 67, 1 (Feb. 2021), 12–19. doi:10.1109/TCE.2020.3045228 Conference Name: IEEE Transactions on Consumer Electronics.

[50] Amon Rapp and Federica Cena. 2016. Personal informatics for everyday life: How users without prior self-tracking experience engage with personal data. *International Journal of Human-Computer Studies* 94 (Oct. 2016), 1–17. doi:10.1016/j.ijhcs.2016.05.006

[51] Katherine M Richardson and Hannah R Rothstein. 2008. Effects of occupational stress management intervention programs: a meta-analysis. *Journal of occupational health psychology* 13, 1 (2008), 69–93. Publisher: Educational Publishing Foundation.

[52] Elizabeth Libby J Sander, Cecelia Marques, James Birt, Matthew Stead, and Oliver Baumann. 2021. Open-plan office noise is stressful: multimodal stress detection in a simulated work environment. *Journal of Management & Organization* 27, 6 (2021), 1021–1037. Publisher: Cambridge University Press.

[53] Akane Sano, Paul Johns, and Mary Czerwinski. 2017. Designing opportune stress intervention delivery timing using multi-modal data. In *2017 Seventh International Conference on Affective Computing and Intelligent Interaction (ACII)*. Institute of Electrical and Electronics Engineers, New York, NY, USA, 346–353. doi:10.1109/ACII.2017.8273623 ISSN: 2156-8111.

[54] Jina Suh, Esther Howe, Robert Lewis, Javier Hernandez, Koustuv Saha, Tim Althoff, and Mary Czerwinski. 2024. Toward Tailoring Just-in-Time Adaptive Intervention Systems for Workplace Stress Reduction: Exploratory Analysis of Intervention Implementation. *JMIR Mental Health* 11, 1 (Sept. 2024), e48974. doi:10.2196/48974 Company: JMIR Mental Health Distributor: JMIR Mental Health Institution: JMIR Mental Health Label: JMIR Mental Health Publisher: JMIR Publications Inc., Toronto, Canada.

[55] David Sun, Pablo Paredes, and John Canny. 2014. MouStress: detecting stress from mouse motion. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '14)*. Association for Computing Machinery, New York, NY, USA, 61–70. doi:10.1145/2556288.2557243

[56] John Sweller. 2011. CHAPTER TWO - Cognitive Load Theory. In *Psychology of Learning and Motivation*, Jose P. Mestre and Brian H. Ross (Eds.). Vol. 55. Academic Press, San Diego, CA, USA, 37–76. doi:10.1016/B978-0-12-387691-1.00002-8

[57] Thuan-Quoc Thach, Dhiya Mahirah, Charlotte Sauter, Adam Charles Roberts, Gerard Dunleavy, Nuraini Nazeha, Yuri Rykov, Yichi Zhang, George I. Christopoulos, Chee-Kiong Soh, and Josip Car. 2020. Associations of perceived indoor environmental quality with stress in the workplace. *Indoor Air* 30, 6 (Nov. 2020), 1166–1177. doi:10.1111/ina.12696

[58] Jørn Toftum, Søren Lund, Jesper Kristiansen, and Geo Clausen. 2012. Effect of open-plan office noise on occupant comfort and performance. In *10th International Conference on Healthy Buildings*, Vol. 2. International Society of Indoor Air Quality and Climate, Herndon, VA, USA, 1417–1422.

[59] Xin Tong, Matthew Louis Mauriello, Marco Antonio Mora-Mendoza, Nina Prabhu, Jane Paik Kim, and Pablo E Paredes Castro. 2023. Just Do Something: Comparing Self-proposed and Machine-recommended Stress Interventions among Online Workers with Home Sweet Office. In *Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems (CHI '23)*. Association for Computing Machinery, New York, NY, USA, 1–20. doi:10.1145/3544548.3581319

[60] Mogens Ager Vold. 1987. New technology in the office: Attitudes and consequences. *Work & Stress* 1, 2 (April 1987), 143–153. doi:10.1080/02678378708258496 Publisher: Routledge _eprint: https://doi.org/10.1080/02678378708258496

[61] Ariane G. Wepfer, Tammy D. Allen, Rebecca Brauchli, Gregor J. Jenny, and Georg F. Bauer. 2018. Work-Life Boundaries and Well-Being: Does Work-to-Life Integration Impair Well-Being through Lack of Recovery? *Journal of Business and Psychology* 33, 6 (Dec. 2018), 727–740. doi:10.1007/s10869-017-9520-y

[62] Nan Zhao, Asaph Azaria, and Joseph A. Paradiso. 2017. Mediated Atmospheres: A Multimodal Mediated Work Environment. *Proc. ACM Interact. Mob. Wearable Ubiquitous Technol.* 1, 2 (June 2017), 31:1–31:23. doi:10.1145/3090096

[63] Nan Zhao, Elena C. Kodama, and Joseph A. Paradiso. 2022. Mediated Atmosphere Table (MAT): Adaptive Multimodal Media System for Stress Restoration. *IEEE Internet of Things Journal* 9, 23 (Dec. 2022), 23614–23625. doi:10.1109/JIOT.2022.3190929 Conference Name: IEEE Internet of Things Journal.

A   Participant summary

Participant demographics and psychosocial job characteristics are included in Table 1. The psychosocial job characteristics scale, based on the JCQ [29], measures "Decision authority" and "Psychological demands" on a normalized scale from -18 to 18. A lower score indicates minimal decision authority or psychological demands, while a higher score reflects greater presence of these aspects within a job role. For example, higher decision authority and psychological demands are indicative of an active job. On the other hand, high psychological demands and low decision authority are indicative of high strain.

B   Semi-structured interview guide

The following section outlines the interview guide used for this project. We used initial questions to guide the conversion, and probe questions were asked to elicit further insights into the participants' experience.

B.1   Initial questions

Recall a couple of times during the months in which the study occurred that you felt particularly stressed while you were at your workstation. You may think of more than two examples.

(1) Can you tell us in as much detail as you can what led you to feeling stressed?
(2) During these stressful events, what actions did you take to remediate your stress, if any?
(3) Right after these stressful events happened, did you ever share about how you felt with others?

B.2   Probe questions

(1) Where did this event occur?
(2) Did this specific event also happen while you were working somewhere else?
(3) When did this event happen? [ask participants to give a date and time, if possible]
(4) How often would the event you just described happen?
(5) Did this event happen regularly or at a specific instance in time?
(6) What kind of activity were you doing during this stressful event? Was it work-related or non-work related?
(7) Do you believe that the activity you were participating in impacted your stress levels? If so, how?
(8) Do you believe that your environment had an impact on your stress? (lighting, window view, temperature, etc. if question is unclear)
(9) Do you believe that factors unrelated to your environment had an impact on your stress? (meetings, family issues, etc. if question is unclear)

Table 1: Participant summary. We included the participants demographics as well as their psychosocial job characteristics. All participants were associated with USC.

ID	Age	Race	Hispanic or Latino	Gender	Work Type	Decision authority	Psychological demands
P1	46	Native Hawaiian or other Pacific Islander	Yes	M	Administrative Assistant	-2	6
P2	42	Black or African American	No	F	Assistant Professor	2	-1
P3	45	White	No	M	Graduate Programs Manager	10	8
P4	41	Asian	No	M	Student Services Advisor	6	1
P5	56	White	No	F	Senior Research Administrator	-6	1
P6	26	White	Yes	F, NB	Administrative Assistant II	10	2
P7	52	White	No	F	Senior Administrator	2	4
P8	47	White	Yes	F	Department Business Manager	2	4

(10) How helpful were the steps you took to remediate/manage your stress? (if unclear: Did you manage to remediate your stress? Is there anything that worked well? Anything that did not work?)

(11) Looking back at this event now, do you think you could have managed your stress differently? If so, how?

(12) How did you feel emotionally during this event?

(13) How exactly did you know you were stressed? Are there any factors/indicators that led you to feel you were experiencing stress?

(14) Did participating in the study impact how this stressful event unfolded? If so, how?

(15) Was there anything different about this event than usual?

(16) What did you learn about yourself and your stress after this stressful event?

(17) Was this event a positive or negative experience?

(18) What kind of information did you share?

(19) Who did you share this information with?

(20) Why did you decide to share this information? Did you believe it helped you in any way?

(21) Would you want other people in your work circles to know when you felt stressed? Would you like them to understand why?

(22) Would you want to know when other people in your work circles felt stressed? Would you like to know why?

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