Towards Inclusive Futures for Worker Wellbeing

SACHIN R. PENDSE, Microsoft Research & Georgia Institute of Technology, USA
TALIE MASSACHI, Brown University, USA
JALEHSADAT MAHDAVIMOGHADDAM, Toronto Metropolitan University, Canada
JENNA BUTLER, Microsoft, USA
JINA SUH, Microsoft Research, USA
MARY CZERWINSKI, Microsoft Research, USA

The global COVID-19 pandemic has spurred on new collaborations across borders, and emphasized the importance of supporting wellbeing in the workplace, whether that workplace is hybrid, remote, or in-person. Work in CSCW, HCI, and organizational psychology has explored how people come to understand their wellbeing at work, and the role of identity, culture, and organizational factors in that process. In this study, we build on this past research and explore the importance of these factors when designing tools that support worker wellbeing for location-independent teams. We ask the question: how did organizational, cultural, and individual factors influence how workers understood their workplace wellbeing needs during the move to remote work? To investigate this question, we conduct a large scale linguistic analysis of 13,265 diary entries collected between 2020 - 2022, and complement it with in-depth interviews with 26 global employees, exploring intersections between technology, context, and wellbeing needs. We utilize this data to analyze the broader human infrastructure supporting hybrid and remote work, demonstrating how ideas around wellbeing are influenced by the (often technology-mediated) environment around both information and essential workers, and power differentials within it. Building on our findings, we provide recommendations for how technology design can better support more diverse and inclusive forms of worker wellbeing.

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

Additional Key Words and Phrases: hybrid work, workplace wellbeing, mixed methods, culture

ACM Reference Format:
Sachin R. Pendse, Talie Massachi, Jalehsadat Mahdavimoghaddam, Jenna Butler, Jina Suh, and Mary Czerwinski. 2024. Towards Inclusive Futures for Worker Wellbeing. *Proc. ACM Hum.-Comput. Interact.* 8, CSCW1, Article 137 (April 2024), 32 pages. https://doi.org/10.1145/3637414

1 INTRODUCTION

The field of Computer Supported Cooperative Work (CSCW) has long explored how technology might support better collaborations between diverse and remotely located workers [8, 48, 59, 79, 92, 121]. Early research within this space explored how good technology design can result in more connected collaborations, and as a result, better products [48, 59, 92]. Recent research in CSCW has turned this lens towards workplace wellbeing, examining how collaborative technologies can be leveraged to not only facilitate the creation of quality products, but also foster a healthier

Authors' addresses: Sachin R. Pendse, Microsoft Research & Georgia Institute of Technology, USA, sachin.r.pendse@gatech.edu; Talie Massachi, Brown University, USA, talie_massachi@brown.edu; Jalehsadat Mahdavimoghaddam, Toronto Metropolitan University, Canada, jmahdavi@torontomu.ca; Jenna Butler, Microsoft, USA, jennbu@microsoft.com; Jina Suh, Microsoft Research, USA, jinsuh@microsoft.com; Mary Czerwinski, Microsoft Research, USA, marycz@microsoft.com.

ACM 2573-0142/2024/4-ART137
https://doi.org/10.1145/3637414

work environment. This research has explored various aspects of workplace wellbeing, including job satisfaction [107], burnout [2], the wellbeing of crowdworkers [125], and the importance of face-to-face encounters for wellbeing [85].

CSCW research around distance work and wellbeing took on particular urgency during the first months of the COVID-19 pandemic[1] in early 2020. The risk of infection posed by the pandemic and quarantine-induced isolation shifted how people understood workplace wellbeing and the types of resources they needed for it. As many were made to work remotely for the first time [13], essential workers were newly mobilized to ensure that the work of remote workers could continue [5, 37, 70, 71]. With these power differentials made more stark, new questions arose around how to ensure that workplaces provided for the diverse wellbeing needs of all workers, independent of when, where, or how an individual does that work [12, 62].

Identity [106], culture [56, 98], and structural or organizational factors [9, 27, 125] all have a strong influence on how people come to understand their wellbeing. It is clear that these factors thus must be considered when designing wellbeing support technologies—however, more work is needed to understand how to design for these critical factors within newly *hybrid* workplaces. Remote and hybrid workplaces are becoming more location-independent, with greater potential for cross-cultural collaborations, but a similarly high potential for the marginalization of information or essential workers [5, 37, 70, 71]. It is thus important to understand where technology design may support cross-cultural collaboration, and where design may actually marginalize workers and their wellbeing needs. To address this question, past work in HCI and CSCW has directed its attention towards the human infrastructures that underlie collaborative technologies [34, 47], with particular attention to how power dynamics [46, 69, 128] and identity-based differences [97] influence the relationship people within the infrastructure have with their work.

In this study, we build on these perspectives and analyze the role that collaborative technologies play in how people conceptualize and experience their wellbeing at work. In particular, we focus our attention to the role of diversity and individual context in a worker's conceptualization of their wellbeing, and the implications of these factors for technology design. Times of massive societal or technological change are often associated with new and lasting ways of thinking about wellbeing [101]—we thus scope our analysis to the rapid shift to remote and hybrid work within technology companies from 2020 to 2022. We ask the following question: **how did organizational, cultural, and individual factors influence how workers understood their workplace wellbeing needs during the move to remote work?**

We answer this question through two main complementary analyses of data from global employees at a multinational technology company—a linguistic analysis of 13,265 diary entries collected between 2020 - 2022, and in-depth interviews with 26 information and essential workers at the same company, guided by the context provided from our linguistic analysis. We take a multifaceted approach to our analysis, paying particular attention to the local context of the global workers we study, as well as the remote, hybrid, or essential in-person nature of the work they do. Through these analyses, we make the following contributions:

- We demonstrate meaningful differences in how people conceptualize and reflect upon their wellbeing at work, across identity-based, cultural, and organizational dimensions.
- We highlight how both local context and collaborative workplace technologies influence these diverse conceptualizations of wellbeing at work, and shed light on how workers accommodate differing conceptualizations of wellbeing in cross-cultural interactions.

[1]The formal title by the World Health Organization (WHO) for the pandemic is The Coronavirus Disease 2019 (COVID-19) pandemic [95]. In this paper, we use the more commonly used phrase "COVID-19 pandemic" when describing the ongoing (at the time of writing) pandemic.

- We illustrate how a rapid reliance on collaborative interaction technologies during the COVID-19 pandemic exacerbated existing wellbeing divides between essential workers and information workers. Through doing so, we shift perspectives around technology and worker wellbeing towards more deeply considering the wellbeing of the essential workers that support collaborative remote and hybrid technologies.
- Building on past research from industrial and organizational (I-O) psychology, we provide recommendations for how collaborative workplace technologies can be designed with a specific care towards both broad parts of worker wellbeing (such as meaning, impact, and recognition) as well as more specific identity-based factors and cultural concerns.

Our work is in conversation with broader research spaces within CSCW and I-O psychology that examine the role of power, class, and cultural differences on wellbeing. Looking to a new era of widespread hybrid and remote workspaces, we argue that worker wellbeing technologies must be designed to be adaptive to the unique cultural, organizational, and individual wellbeing needs of *all* workers, across the broader human infrastructures that support work.

2 RELATED WORK

Our study builds on three broader bodies of work at the intersection of collaborative technologies and diversity in wellbeing at work. First, we draw on work that studies how digital workspaces can be designed towards better worker wellbeing, and through our study, foreground the importance of identity, culture, and organizational factors in these spaces. Second, we build on work from industrial and organizational (I-O) psychology, organizational anthropology, and sociology that analyze diverse understandings of workplace wellbeing—our study extends these perspectives to remote and hybrid workspaces. Third, we build on work examining the *human infrastructures* that underlie the production of work, utilizing this concept to shed light on the often invisible and diverse wellbeing needs of the essential workers that support remote and hybrid work. Through drawing upon these three research spaces, we study how individual conceptualizations of workplace wellbeing are produced through a complex confluence of individual context, relationships between workers, and the technology that mediates interactions between workers. Below, we briefly review the three broader bodies of work that support our study.

2.1 Wellbeing in Digital Workspaces

Research within the field of CSCW, from the field's early days [48], has sought to understand how the use of collaboration technologies may change how workers relate to each other, and as a result, workplace culture. For example, in *Distance Matters*, Olson and Olson [92] review research done on remote work, and describe factors that lead to effective remote workplace collaboration—the creation of a common ground among workers, coupling of group work, collaboration readiness, and comfort with collaboration technology (with organizational management later added as a fifth attribute [93]). Similarly, Johansen's time-space matrix [12, 62] (often called the CSCW matrix [64]) categorizes how interactions between when work is done (such as whether it is done synchronously or asynchronously) and where work is done (such as whether done co-located or remotely) can influence how workers collaborate. Later research found that these broader factors, the nature of the work being done and the form of collaboration underlying that work, strongly relate to workplace wellbeing. For example, Georganta et al. [43] find that interactive collaborative technologies can help make teams more effective (such as through greater coordination, trust, team performance), and especially so if teams are co-located or working synchronously. Similarly, other work in CSCW has found that interactive collaborative technologies can be useful in building supportive and connected communities outside of work contexts [68, 98, 116]. However, Bjørn et al. [8] describe

how interactive and collaborative technologies can lead to greater labor and strain for workers who are forced to utilize them—time zone differences, unstable technology, and an organizational need for frequent communication can influence the wellbeing experiences of remote workers.

This early work around strain in remote workspaces has spurred on recent research around how remote and hybrid workplace technologies can be designed to support the wellbeing and quality of life of workers, particularly in light of the mass transition to remote and hybrid work. For example, Rudnicka et al. [105] find that digital nudges to take unambiguous and active breaks can significantly support the wellbeing of workers. Similarly, Haliburton et al. [50] find that integrating physical activity into daily workplace meetings (such as walking meetings) can be positive for employee wellbeing, and accommodate social distancing requirements. Related work has also examined how to design around the additional strain introduced by remote and hybrid work technologies (or what is often called "Zoom fatigue" [91]). Research done during the mass transition to remote work has shown that workers have difficulty focusing and remaining present during video meetings [15, 78, 81], are negatively affected by the loss of small talk and serendipitious collaborations [88, 117] after meetings, and experience a lack of creativity and participation during meetings due to multitasking [4]. To address these forms of strain, Ansah et al. [4] find that automatic summaries of meeting content after a remote meeting can reduce strain and help keep employees engaged with work, and Yang et al. [129] find that a greater transparency to how communication tools are being used can help coworkers feel more connected. However, technology design is just one aspect of supporting the wellbeing of remote, hybrid, and in-person workers.

Research on the future of work has extensively studied how workplace wellbeing for remote and hybrid workers has been strongly influenced by interactions between technology and the broader social context around the worker. This includes highlighting how remote and hybrid work can improve the quality of life of workers through increasing the flexibility and agency a worker has [17, 35, 60, 77]. However, work in this space also highlights potential negative social aspects of mass remote or hybrid work, including anxieties around a new computerization of work, which has been demonstrated to have negative impacts on workers' wellbeing [90], such as mental health [102], physical health [104], and lifestyle [58]. Additionally, a move to remote work can potentially exacerbate existing forms of marginalization, including those who may be neurodivergent [27], racial minorities [57], or along cultural or national lines [32]. This research notes that a specific attention to potential dimensions of marginalization is important for healthier remote and hybrid workspaces, including an attention to technology design and social or cultural contexts around workers, and how the two interact.

In light of this past research, more work is needed to understand how people conceptualize and maintain their wellbeing in digital workplaces, particularly given substantial cultural and identity-based differences in how people understand and express wellbeing. The mass global increase in remote work during the COVID-19 pandemic [13, 73, 108] has made collaboration across borders more possible. However, as multinational companies work to better support the wellbeing of their employees, it is unclear how diverse individual, cultural, and organizational understandings of wellbeing may influence how workers interact with each other, where conflicts in definitions of wellbeing may arise, and the implications of those conflicts. We work to fill this gap with our study, drawing also on work from I-O psychology, organizational anthropology, and sociology that has examined these questions outside of a remote work environment.

2.2 Sociocultural Approaches to Wellbeing at Work

Research from diverse fields outside of CSCW and HCI has examined how individual context, shared cultural values, and organizational structure influence wellbeing at work. We thus find it critical to examine these factors in the wellbeing of remote, hybrid, and essential workers.

Research in I-O psychology, work psychology, and sociology has explored the role that work plays in an individual's life, how it interacts with other aspects of an individual's life, and the implications of workspaces for broader wellbeing. Individual understanding of work is highly influenced by interactions between different aspects of individual context. This may include identities that an individual might hold [24], personal values or goals outside of work [127], and socioeconomic conditions that influence an individual's reliance on work for livelihood [119]. For example, Hakim [49] and Correll [24] have described how context (such as equal opportunities for work, the creation of jobs for secondary earners, access to gender-specific healthcare, or biased ideas about competence) can influence how women understand the role of work in their lives and choose their occupations. Drawing on Hochschild [54], Wharton [124] has written about how these dynamics (including societal biases) force women to take on more emotional labor in the workplace. Examining the influence of class, Standing [119] has described the concept of the *precariat*, or individuals who lack long-term economic security as a result of poverty and other social factors, and thus understand work based on their livelihood needs and the availability of paid work.

When examining patterns that may cut across diverse demographics [14, 33], research in I-O psychology and organizational anthropology has found that central to workplace wellbeing is perceiving a sense of meaning associated with work, relating that meaning to the self, and minimizing the level of strain or social isolation associated with doing work [63, 66, 127]. For example, Wrzesniewski et al [127] describe how an individual's identification with their work (whether as a job, career, or calling), and how they find meaning in it, can influence the level of wellbeing they derive from their work. In the iso-strain model of wellbeing at work, Karasek et al. [66] and Johnson [63] describe how high stress and low levels of social support (dubbed iso-stress) can lead to a lack of satisfaction with work and negative health outcomes, and that these factors are often related to the context surrounding the worker.

Along with individual context, shared cultural values have also been demonstrated to have a strong influence on how people relate to their coworkers and workplace, and consequently, how they conceptualize wellbeing at work. A foundational work in this research space, Hofstede's cultural dimensions theory argues that dimensions of national culture influence how individuals approach their relationship to work [56]. Hofstede argues that cultural dimensions include the level of acceptance of hierarchy within a culture, how individualistic (or collectivist) a culture is, cultural levels of tolerance for uncertainty, adherence to traditional gender roles, levels of short or long-term focus, and accepted levels of indulgence and restraint. Hofstede's empirical work demonstrates the strong role that national culture can play at the workplace, and its influence on how people thus experience wellbeing at work. Some examples of how national culture can influence wellbeing at work include healthcare being tied to employment [36, 42], work culture being structured around sacrifice of individual needs [94], and norms around what hours are acceptable to work [25].

It is important to note that while culture can be national, it can also be organizational. Schein [113] argues that organizational culture is the product of shared assumptions, shared values, and the built environment that employees work within.[2] However, considering factors similar to Hofstede's can be useful in analyzing organizational culture, including levels of hierarchy within an organization, how workers interact with one another, and where decision-making power is concentrated. These broader factors have been demonstrated to strongly relate to wellbeing at work, including levels of psychological health [31] and overall job satisfaction [83].

Our study extends these perspectives to the rapid adoption of hybrid and remote work, analyzing how organizational, cultural, and identity-based contextual factors play a role in people's experiences of workplace wellbeing within new technology-mediated modalities of work. However, in

[2]Schein calls the physical aspects of organizational culture "artifacts." [112]

examining organizational factors, we also draw particular attention to those workers who support the technologies and facilities that make collaborations possible, and highlight their wellbeing. We highlight power differentials between information workers (who conduct work utilizing collaborative technologies) and the infrastructure of essential workers who make their work possible, analyzing the implications of these differentials for wellbeing within hybrid and remote workspaces.

2.3 Human Infrastructures of Remote and Hybrid Work

When investigating pain points in experiences with digital workplaces, work in CSCW has primarily approached this question from the perspective of information workers [120, 126, 130], and their experiences with the interfaces and affordances of remote work. However, technology-mediated labor is the product of a vast network of workers, including information workers *and* essential workers, or people who were not able to work remotely during the COVID-19 pandemic, and often served the needs of those who did work remotely [5, 37, 70, 71]. We understand this broader network to be a *human infrastructure*, or what past work in HCI and CSCW has defined as "shared social practices, flows of information and materials, and the creative processes that are engaged in building and maintaining" technology for "work to be accomplished" [34, 80, 97, 111]. For this study, we analyze how individual conceptualizations of workplace wellbeing are created through interactions across the human infrastructure that underlies production at the workplace we study.

In particular, we pay specific attention to how experiences of wellbeing may be different for people who occupy different positions in this network. Workplace wellbeing programs are often created with little differentiation between employees [19, 23, 45, 86]. In this study, we explore how these generalized programs may miss the individual nuances to how people experience wellbeing, particularly for those who both work in digital workspaces *and* those essential workers who support digital workspaces. In their writings on the invisible work underlying artificial intelligence (AI), both Gray [46] and Spektor et al. [118] describe the importance of making visible the kind of essential work necessary for AI applications. Both authors argue visibility ensures that workers are able to better organize and advocate for their own wellbeing, such as for fair wages or working hours. This follows other work in CSCW supporting the rights of workers who may be marginalized by the sociotechnical system they support [40, 44, 69, 76, 103, 109, 114].

We apply this lens to the sustained shift to remote and hybrid work that occurred during the early months of the COVID-19 pandemic. Following Bjørn's call for researchers to center "the humanity, the self-organization, and the empowerments of the employee" [7] in research on remote work, we investigate differences in how people who worked remotely, hybrid, and in-person conceptualized wellbeing. Building on Karasek et al. [66] and Johnson [63]'s work around the importance of minimizing strain and maximizing social support, we pay specific attention to how networks of labor and support influenced how people understood wellbeing, and where their workplace wellbeing needs were or were not met by existing programs, for both digital and offline workspaces. Additionally, building on theory from Hofstede [56] and Schein's [113], we pay specific attention to cultural difference and power differentials between information and essential workers, and analyze how differentials are reflected in the design of workplace environments and wellbeing programs.

To conduct this analysis, we explore both broad differences between groups in the infrastructure, as well as people's lived experiences with wellbeing as a part of the infrastructure. We thus leverage a large-scale analysis of diary entries to understand broad differences, and then contextualize this analysis with interviews centered around wellbeing, identity, and culture among essential, hybrid, and remote employees within the same company.

Table 1. Demographics of the diary study dataset, with strong diversity along occupational, regional, and gender identity lines. The *Other Engineers* occupational category includes occupations such as mechanical engineering and electrical engineering. Location was determined based on employee's primary location of employment at the time of study participation. Posts from participants that did not respond to demographic questions were not included in the analysis for the specific demographic dimension.

Occupation	Number of Participants
Software Engineers	225 (34.99%)
Program Managers	71 (11.04%)
Hardware Engineers	63 (9.80%)
Research and Design	37 (5.75%)
Data Scientists	6 (.93%)
Other Engineers	10 (1.56%)
Other	12 (1.87%)
Did Not Respond	219 (34.06%)

Region	Number of Participants
North America	358 (55.68%)
South Asia	33 (5.13%)
Europe and Central Asia	17 (2.64%)
East Asia and Pacific	14 (2.18%)
Middle East and North Africa	3 (0.47%)
Latin America and the Caribbean	1 (0.16%)
Sub-Saharan Africa	1 (0.16%)
Did Not Respond	216 (33.58%)

Gender Identity	Number of Participants
Men	275 (42.77%)
Women	139 (21.62%)
Non-Binary	4 (0.62%)
Did Not Respond	225 (34.99%)

3 ANALYZING EXPRESSIONS OF WORKPLACE WELLBEING

We begin by utilizing a large scale linguistic analysis to explore broad trends in how wellbeing needs are *expressed* by workers in their daily lives, and how these needs shift over time and across populations. We find differences in expressions to potentially be indicative of differences in conceptualizations of wellbeing at work, strongly influenced by the technology people use for hybrid and remote work. We structure our analysis across the three dimensions discussed in Section 2.2—organizational differences (utilizing the occupational groups that participants belonged to), cultural differences (utilizing the countries participants were located in at the time of study), and identity-based differences (utilizing the reported gender identity by participants). Below, we further expand on our motivation for utilizing these demographic dimensions, how we operationalize them in our study, and the linguistic methods we use to conduct our analysis. Our linguistic analysis forms an important context for our analysis of the lived wellbeing experiences of the workers we interview in the second part of our study.

3.1 Method

Our dataset is comprised of diary entries collected during the move to remote work. Data collection and analysis were approved by the Institutional Review Board (IRB) at our research institution.

3.1.1 Data Collection. Our analysis builds on methods from past work in CSCW and HCI utilizing diary studies to understand workplace experiences [1, 11, 26]. We utilize data from a similar longitudinal diary study, launched on March 18th 2020, 7 days after the WHO declared COVID-19 a pandemic [95]. Participants were recruited via email at a multinational technology company, and were asked if they wanted to participate in a reflective exercise that could also support research around experiences and workplace needs during a rapidly changing time.

Participants in the diary study were asked what they found most challenging about their day, what they were most grateful for, and any miscellaneous information to provide context to their other answers. Participants were asked these specific questions following past research, including Cho et al.'s [20] use of challenging experiences to analyze discussions of workplace wellbeing in online forums, and Lai et al.'s [75] description of the strong relationship between gratefulness and wellbeing. Participants received a technology-mediated nudge (e.g., email or chat reminder) to complete a diary entry for the day. Our final dataset used for analysis included a total of 13,265 entries from 643 different workers between March 18th 2020 and July 21st 2022. Participants consistently responded, with an average of 20.63 entries per user (σ = 43.82; median = 4).

All participants were from the same multinational technology company, but were diverse in organizational group, geographical region, and gender identity. Specific information about the demographic distribution of this dataset can be seen in Table 1, with demographic information gathered via participant report. We utilize these three dimensions for our analysis in light of research from I-O and work psychology demonstrating a strong relation to how people conceptualize their experience with work, and subsequently, their wellbeing needs at work (as described in Section 2.2). We describe how we operationalize these dimensions below:

- **Organizational Differences:** We divide participants into organizational groups by utilizing their reported occupations, following past research showing that organizational groups within technology companies are often divided based on the type of occupation or work done [52]. Wellbeing programs have also been demonstrated to be highly variable based on the organizational group they are designed for, and especially beneficial when organizational or occupational context is considered [16, 41]. To operationalize organizational groups, we thus utilize the grouping system of the company from which we recruited participants, for occupations that are highly represented in the dataset: software engineers (SWEs), project managers (PMs), hardware engineers (HEs), and research and design workers (R&Ds).
- **Cultural Differences:** We divide participants into cultural groups based on the location that they reported working from, matching participant locations to broad geographic categories from The World Bank [74]. We follow past research in CSCW [30, 98] in utilizing geographic region as a proxy for dimensions of culture, and discuss the limitations of this approach in our Discussion. However, we also understand geographical region to be a particularly salient dimension for analysis given similar COVID containment measures and policies among bordering countries within geographic regions [18, 89]. We focus on three main regions—North America (NA), South Asia (SA), and Europe & Central Asia (E&CA). Participant locations were determined based on the participant's primary location of employment at the time of study participation. Specific statistics for all regions analyzed are in the Appendix.
- **Gender identity:** We utilize gender identity as the main dimension of individual identity we analyze across our diary study dataset. We choose this dimension due to the strong influence that gender identity has on how individuals experience workplace wellbeing (as we discuss in Section 2.2, with work from Hakim [49], Correll [24], Hochschild [54], and Wharton [124]). Gender minorities are also globally subjected to lower wages [39], harassment [6, 38, 115], and a more difficult experience with career progression and promotion [53]. We limit our analysis of gender to the aggregated gender identity categories male, female, and non-binary due to a low representation of individuals of other gender identities.

3.1.2 Analysis. To analyze differences between demographic groups, we utilize two main linguistic methods, grounded in past HCI and CSCW research—the Linguistic Inquiry and Word Count (LIWC) text analysis framework [99], and an analysis of disjoint common words and phrases (operationalized as n-grams) between different populations [98].

The LIWC text analysis framework is well validated to examine ideas around wellbeing, having been used to predict episodes of depression via social media data [29], predict when someone might express that they feel better on an online mental health forum [100], and infer level of job satisfaction from social media posts [107]. We utilize the LIWC text analysis framework to develop an understanding of broad differences in affect, sentiment, and themes discussed between demographic populations. We utilize 27 LIWC dimensions that have been related to work and wellbeing in past research [107], such as *affect*, *work language*, or *social concerns*. We make multiple comparisons across these LIWC dimensions, and thus apply the Bonferroni correction to reduce statistically significant findings due to random chance, adjusting our level of significance to $p < .002$

for all LIWC comparisons, done via a Welch's t-test. We normalize our counts of LIWC dimension words based on the length of the sentence, reporting the percentage of an individual post that includes language from a given LIWC category.

Our LIWC-based analysis provides us a broad view of themes associates with how people discuss workplace wellbeing needs. However, to add context to these trends, we follow Pendse et al.'s [98] method of finding disjoint n-grams to find more subtle and specific differences in language across demographic groups. To do so, we first find the 100 most common words (unigrams) and phrases (bigrams) for a given demographic group (for example, participants who are software engineers). We similarly find the 100 most common unigrams and bigrams for all entries from participants that are not in this demographic group, or what can be thought of as the majority set (e.g., all participants who are *not* software engineers). We then find those unigrams and bigrams that appear in the top 100 for the given demographic of study, and also do not appear in the top 100 for the broader participant population.

This provides us with the words and phrases that are distinctly used more by a given demographic. We then test for statistical significance for the top 5 most uniquely used unigrams and bigrams by the demographic of study, comparing use of these 10 n-grams between the demographic of study and the broader population excluding that demographic. Given that there may be different counts of disjoint n-grams in each comparison group, here too, we utilize Welch's t-test to make comparisons. We also apply the Bonferroni correction here, at $p < .005$ (derived from the 10 n-grams we test for statistical significance, and a base significance level of .05). We report the percentage of diary entries from a given demographic that contain the word or phrase.

Although our dataset includes entries for challenges, gratitude, and miscellaneous questions, we found no significant or discernable findings for miscellaneous questions, as miscellaneous questions were highly specific to individuals. Therefore, for the remainder of this section, we present our analysis results for the challenges and gratitude questions only. Full metrics from our analysis across demographic groups and questions can be seen in our attached Appendix section.

3.2 Findings

We organize our findings via the three demographic dimensions that we examine: organizational differences, cultural differences, and identity-based differences. We find demographic differences in expressions of wellbeing at work that are in line with patterns described in past research from I-O psychology and organizational anthropology. Building on this past work, in a hybrid and remote work context, we find that differences are strongly influenced by intersections between demographic attributes, and participant engagements with collaborative technologies and remote work tools. For each demographic difference, we report findings from both aspects of wellbeing in our study, *challenges* and *gratitude*, relating them back to specific wellbeing needs each population may have. When describing unigrams from responses to the challenges question, we utilize bolded **red font**. For unigrams from responses to the gratitude question, we utilize bolded **blue font**.

3.2.1 Broad and Temporal Trends. We begin by examining broad trends in wellbeing expressions independent of demographic group, and how these trends changed over the course of the years of the COVID-19 pandemic. Our findings reveal common experiences of wellbeing challenges and gratitude in participants' daily work life, often related to interactions between remote work technologies and the quickly changing context associated with the pandemic.

As we present in Table 2, common challenges encountered by participants include meeting burnout, productivity-related psychological hurdles such as **getting started**, **staying focused**, and getting **work done**. However, technological limitations also play a role in daily challenges, including mention of **remote desktop** applications. Participants also identified **back pain** as a

Table 2. Most common unigrams and bigrams for the entire dataset. The percentage value indicates the percentage of posts that contain the displayed unigram or bigram. Main challenge points include psychological challenges associated with productivity, issues with collaboration technologies, and ergonomic experiences. Work flexibility, family, and social connections are main points of gratitude.

Challenges		Gratitude		Miscellaneous	
work (12.57%)	many meetings (3.24%)	work (12.48%)	focus time (.82%)	work (7.64%)	feel like (.92%)
meetings (11.26%)	staying focused (1.45%)	home (7.90%)	home office (.75%)	day (5.06%)	feels like (.39%)
day (8.34%)	feel like (.67%)	able (7.84%)	nice weather (.71%)	time (4.33%)	work done (.40%)
time (7.05%)	work done (.58%)	time (7.31%)	flexible work (.70%)	today (4.07%)	many meetings (.34%)
getting (5.74%)	finding time (.53%)	flexibility (7.16%)	work done (.60%)	like (3.21%)	good day (.33%)
nothing (5.72%)	getting started (.52%)	day (6.10%)	meeting friday (.45%)	get (2.86%)	looking forward (.32%)
today (5.59%)	good day (.47%)	family (5.67%)	work hours (.39%)	feel (2.71%)	productive day (.26%)
many (5.39%)	back pain (.45%)	today (5.25%)	good weather (.37%)	really (2.35%)	next week (.26%)
none (4.60%)	enough time (.44%)	team (5.07%)	take care (.36%)	week (2.25%)	felt like (.26%)
back (4.25%)	remote desktop (.44%)	good (4.32%)	work day (.35%)	home (2.22%)	even though (.24%)

Table 3. Temporal analysis of top 10 most common unigrams and bigrams for *challenges* and *gratitude*. The last two rows of the temporal section include unigrams and bigrams that have the highest relative change between 2020 and 2021 and between 2021 and 2022. Positive changes are noted by + in front of the n-gram, and negative changes are noted by -. For year to year comparisons, n-grams with a statistically significant change at $p < .005$ are colored in **red** if from the challenges question, and **blue** if from the gratitude question. Those that are not statistically significant are italicized.

	CHALLENGES		GRATITUDE	
	Unigram	**Bigram**	**Unigram**	**Bigram**
Temporal				
Most unique to 2020	hours, remote, internet, wfh, take, morning, new, connection, slow, productive	back back, too many, remote desktop, back meetings, being able, the time, long day, end the, much work	ability, teams, none, lot, walk, healthy, around, [company], sunny, safe	was able, my family, time family, i am, able wfh, time my, take care, at home, a lot, work day
Most unique to 2021	like, feel, vacation, busy, going, particular, enough, taking, pain, focusing	feel like, back pain, difficulties today, starting day, last week, time the, focusing work, much do, get done, coming back	safety, like, still, grateful, kids, vacation, could, went, peaceful, !	safety home, the office, job flexibility, fhl week, with family, meeting free, meeting fridays, bike ride, grateful the
Most unique to 2022	new, morning, last, due, keeping, friday, early, sick, managing, email	team members, a meeting, hardest part, keeping with, my team, focus time, meetings a, back back, getting work, getting the	ability, colleagues, person, lot, breaks, healthy, help, making, collaboration, teams	am grateful, grateful i, commute time, was able, staying healthy, use commute, i able, headphones block, get work, noise-canceling headphones
2020 – 2021	**-collaboration**, *+discomfort*, **+catching**, **+playing**, **-none**, **+busy**, **+vacation**, **+difficulties**, **-internet**, **+manager**	*+competing priorities*, *+back from*, *+dealing conflicting*, *+super busy*, *+boring work*, *+conflicting priorities*, **+playing outside**, *+ramping back*, **+catching on**, *+uninteresting work*	**-none**, *+spring*, **-staying**, **-music**, **-healthy**, **+vacation**, **+fridays**, **+peaceful**, **-nothing**, *+therapy*	**+job flexibility**, **+wfh flexibility**, *+flexibility good*, *+fhl demos*, *+low meeting*, *+spring weather*, *+new team*, *+was reasonably*, *+meeting day*, **-time family**
2021 – 2022	**+driving**, *+commuting*, **-pain**, **+traffic**, **-fhl**, **+managing**, *-physical*, **-particular**, **-busy**, *-heat*	*-motivation work*, **-competing priorities**, *-back vacation*, *-back work*, **+team members**, *-nothing much*, *-focusing work*, *+a coworker*, *+people the*, *+nothing specific*	**+staying**, **+impact**, **-husband**, **+tea**, **-safety**, *-conditioning*, **+healthy**, **+collaboration**, *+colleagues*	**+grateful i**, **+commute time**, **-safety home**, **-with family**, *-wfh flexibility*, *-air conditioning*, **+am grateful**, *-stuff done*, *-reasonably productive*

challenge, aligning with past research on the ergonomic experiences of remote work [96]. When viewed temporally, diary entries around challenges from participants often reflect current events and context, as we present in Table 3. For example, in 2020, challenges mentioned by participants revolved around remote work technologies, including frequent mentions of **remote**, **internet**, and **WFH**.[3] Our LIWC analysis also demonstrates a higher discussion of social life (or lack thereof) being a challenge, with social language at 5.72% ($\sigma = .01$) in 2020 compared to 4.45% ($\sigma = .009$) in 2021, at $p < 10^{-7}$. However, by 2021, challenges discussed by participants were more reflective and forward-looking, while also discussing psychological or physical difficulties. This included mentions of **vacation**, **last week**, **focusing (on) work**, and **back pain**. By 2022, the discourse

[3]This is a common acronym for "work from home."

Table 4. Organizational Comparison. N-grams with a statistically significant difference at $p < .005$ are colored in **red** if from the challenges question, and **blue** if from the gratitude question. Those that are not statistically significant are italicized. All LIWC comparisons are significant at $p < .002$. AO stands for All Other, representing the sample excluding the demographic group of analysis. We find that differences across organizations tend to be tied to the nature of the work being done and the technology used for that work. Expressions of gratitude tend to be relatively consistent across organizational groups.

Organizational Differences		
Challenges		
Unigrams	Bigrams	LIWC
remote – SWE: 1.70% (σ =.02%), *AO* : .58%(σ =.006%)	**remote desktop** – SWE: .63% (σ =.006%), *AO* : .07%(σ =.0007%)	Social – SWE: 5.00% (σ =.01%), *AO* : 6.57%(σ =.01%)
connection – SWE: 1.09% (σ =.01%), *AO* : .70(σ = .007%)	**my team** – PM: .80% (σ =.008%), *AO* : .25%(σ =.002%)	Social – PM: 7.31% (σ =.02%), *AO* : 5.13%(σ =.01%)
slow – SWE: 1.21% (σ =.01%), *AO* : .58%(σ =.006%)	*driving to/from* – HE: .68% (σ =.007%), *AO* : 0.00(σ =0%)	
back-to-back – PM: .98% (σ =.01%), *AO* : .14%(σ =.001%)	*to/from work* – HE: .68% (σ =.007%), *AO* : 0.00(σ =10^{-5}%)	
debugging – HE: 1.91% (σ =.02%), *AO* : .36%(σ =.004%)	*last minute* – R&D: .91% (σ =.009%), *AO* : .17(σ =.002%)	
commute – HE:1.91% (σ =.02%), *AO* : .17%(σ =.002%)	*on urgent* – R&D: .57% (σ =.006%), *AO* : 0.00%(σ =0%)	
Gratitude		
Unigrams	Bigrams	LIWC
kids – PM: 1.60% (σ =.02%), *AO* : .91%(σ =.0009%)	**peaceful home** – SWE:.49% (σ =.005%), *AO* : 0.00%(0.00%)	Home – SWE: 4.26% (σ =.02%), *AO* : 1.81%(σ =.004%)
dog – PM:1.38% (σ =.01%), *AO* : .26%(σ =.003%)	**staying healthy** – SWE: .52% (σ =.005%), *AO* : .02%(σ =.0002%)	Work – HE: 10.92% (σ =.02%), *AO* : 8.61%(σ =.02%)
collaboration – HE: 1.63% (σ =.02%), *AO* : .36%(σ =.004%)	**time family** - SWE: .44% (σ =.004%), *AO* : .12%(σ =.001%)	Social – PM: 6.24% (σ =.01%), *AO* : 7.74%(σ =.03%)
person – HE: 2.72% (σ =.03%), *AO* : .46%(σ =.005%)	**fast internet** – HE: 1.09% (σ =.01%), *AO* : 0%(σ =0%)	Home – PM: 1.87% (σ =.005%), *AO* : 3.78%(σ =.02%)
colleague – R&D: 2.16% (σ =.02%), *AO* : .17%(σ =.002%)	*team member* – HE: .82% (σ =.008%), *AO* : .04%(σ =.0004%)	

had shifted again, covering broader logistical and social concerns, such as **managing** or **team members**, with social language constituting 5.77% (σ = .01) of entries. These changes, tied to the passage of time, may be reflective of how changes in current events (e.g., the nature of the pandemic and ability to work in-person) influenced how people experienced wellbeing at work.

Simultaneously, participants appreciated the flexibility and comfort that remote work offered, describing gratitude for having a **home office** and **flexible work**. Participants also described being grateful for social connections, including **family** or their **team**. Temporal patterns also emerged in expressions of gratitude, highly connected to the context of current events. 2020 was marked by gratitude for health and family, denoted by participants with mention of **healthy**, **my family**, and **time (with) family**. Our LIWC analysis for 2020 also showed significantly higher discussion of the self (2.22% of an entry on average, $\sigma = .004$, $p < 10^{-5}$) and of risk (.44% of an entry on average, $\sigma = .001$, $p < .0003$). In 2021, gratitude revolved around **the office**, **safety**, family (including **kids**), and **job flexibility**, perhaps in anticipation of a return to the office. By 2022, entries had moved towards social concerns, such as other **person**s and **colleague**s, aligning with a decrease in language related to home, from 5.04% ($\sigma = .03$) in 2021 to 2.25% ($\sigma = .008$) in 2022, at $p < 10^{-11}$. This trend aligns with research from I-O and work psychology emphasizing social connectedness in workplace wellbeing [63, 66], particularly for hybrid or remote workers [10].

3.2.2 Organizational Differences. In our cross-demographic and temporal analysis, we find shared places of challenge and gratitude when diary study participants described their wellbeing experiences. However, when disaggregating participants by their organizational group (utilizing occupation as a proxy for group), we find that the specific roles that employees have, and the technologies they use for collaboration, have an important role in shaping these experiences. We find nuanced differences between how Software Engineers, Hardware Engineers, and Project Managers describe the challenging and positive aspects of their wellbeing experiences, reflecting both the shared human experience of the COVID-19 pandemic and the unique aspects of each role.

As we present in Table 4, we find that Software Engineers (SWEs) describe challenges associated with remote work technologies, including significantly higher mentions of **remote**, **slow**, and **remote desktop**. In contrast, Hardware Engineers (HEs) express challenges with engineering tasks like **debugging** and notably, also report commuting struggles, with **commute** used significantly more frequently than for non-HEs. Similarly, **driving to/from (work)** is discussed by HEs in .68%

Table 5. Cultural Differences Comparison. N-grams with a statistically significant difference at $p < .005$ are colored in **red** if from the challenges question, and **blue** if from the gratitude question. Those that are not statistically significant are italicized. All LIWC comparisons are significant at $p < .002$. AO stands for All Other, representing the sample excluding the demographic group of analysis. Discussing challenges, North Americans workers (NA) tend to express distress via psychological framings, whereas South Asian (SA) workers tend to utilize words around collaboration and around technical issues. Similarly, expressions of gratitude among NA tend to emphasize safety, whereas SA tend to emphasize family and technical infrastructure.

Cultural Differences		
Challenges		
Unigrams	Bigrams	LIWC
collaboration – SA: 9.69% (σ =.09%), AO : .27%(σ =.003%)	**staying focused** – NA: 1.60% (σ =.02%), AO : .09%(σ =.09%)	Time – NA: 7.00% (σ =.01%), AO : 5.66%(σ =.01%)
vpn – SA: 3.46% (σ =.03%), AO : .32%(σ =.003%)	**finding time** – NA: .66% (σ =.007%), AO : .09%(σ =.0009%)	Health – NA: 1.16% (σ =.005%), AO : .61%(σ =.002%)
stressed – E&CA: 1.98% (σ =.02%), AO : .24%(σ =.002%)	**infra issues** – SA: 2.77% (σ =.03%), AO : 0.00%	Work – SA: 13.81% (σ =.06%), AO : 7.50%(σ =.02%)
deadlines – E&CA: 2.16% (σ =.02%), AO : .19%(σ =.002%)	*slow internet* – SA: 1.73% (σ =.02%), AO : .06%(σ =.0006%)	
	vpn disconnections – SA: 1.38% (σ =.01%), AO : 0(σ =0%)	
	unclear expectations – E&CA: .72% (σ =.007%), AO : 0%(σ =0%)	
Gratitude		
Unigrams	Bigrams	LIWC
internet – SA: 2.77% (σ =.03%), AO : .44%(σ =.004%)	**safety home** – NA: 1.44% (σ =.01%), AO : 0(σ =0%)	Work – NA: 8.97% (σ =.02%), AO : 6.59%(σ =.02%)
facilities – SA: 1.38% (σ =.01%), AO : .01%(σ =10^{-5}%)	**working home** – NA: .87% (σ =.009%), AO : .27%(σ =.009%)	
garden – E&CA: 1.80% (σ =.02%), AO : .14%(σ =.001%)	*health family* – SA: 1.73% (σ =.02%), AO : 0%(σ =0%)	
	care health – SA: 1.38% (σ =.01%), AO : 0%(σ =0%)	

of entries, absent in entries from non-HEs. The use of these phrases related to commuting struggles reflects a unique aspect of the role of HEs, or the requirement that they work in-person during the pandemic, and its influence on wellbeing at work. Similarly related to the nature of their role and tools used, Project Managers (PMs) commonly describe challenges stemming from the back-to-back nature of meetings, with **back-to-back** being a frequently used term. PM diary study participants also discuss experiences with **my team** more, and a higher use of social language (as measured by LIWC) compared to non-PMs ($p < 10^{-14}$). This may be be representative of the extensive collaboration associated with PM roles, including communication with diverse stakeholders.

Looking at expressions of gratitude, the factors contributing to wellbeing appear to be remarkably consistent across roles, even if the specific language used is different. Social connections play a key role, with SWEs expressing appreciation for a **peaceful home** and **time (with) family**, while PMs express specific gratitude for their pets (e.g. **dog**). Relationships with colleagues are also important for wellbeing, across organizational groups—though not significant compared to the majority set, HE and R&D participants appreciate **collaboration** and **team member**s, and R&D participants mention their **colleague**s significantly more than other occupational groups. Certain job-specific factors do influence gratitude, as evidenced by HEs' appreciation for **fast internet**—however, overall, we find positive factors mentioned by participants to be consistent.

Overall, we find wellbeing needs to be highly intertwined with the nature of employees' roles and the professional tools that they use, particularly with regards to wellbeing challenges.

3.2.3 Cultural Differences. Along with organizational group and technology used, we also find that expressions of wellbeing needs are strongly influenced by cultural and national identities, as we present in Table 5. We find differences to align with past research in I-O and work psychology around cultural differences in individualism and collectivism at work [55, 56], including a focus from North American employees on individual psychological issues and support, and from South Asian employees on technical and social challenges, as well as their family's health.

For example, North American diary study participants utilized language indicative of individual psychological distress when discussing challenges, including difficulties **staying focused**, or time-related issues such as **finding time**, also supported by their notably higher use of language around time ($p < .0001$) via our LIWC analysis. Similarly, participants from Europe & Central Asia described feeling **stressed** with **deadlines**, both individual challenges. In contrast, South

Table 6. Identity Based Differences. N-grams with a statistically significant change at $p < .005$ are colored in **red** if from the challenges question, and **blue** if from the gratitude question. Those that are not statistically significant are italicized. All LIWC comparisons are significant at $p < .002$. AO stands for All Other, representing the sample excluding the demographic group of analysis. Discussing challenges, Male (M) workers tend to emphasize work tools, whereas female (F) workers tend to describe feelings and reflections on those feelings when discussing challenges. Non-binary (NB) workers tend to describe psychological expressions and their manager. Looking at points of gratitude, M, F, and NB tend to describe social connections.

Identity-Based Differences		
Challenges		
Unigrams	Bigrams	LIWC
WFH – M: 1.48% (σ = .01%), AO : .76%(σ = .008%)	*feel like* – F: .91% (σ = .009%), AO : .51%(σ = .005%)	I – F: 1.35% (σ = .001%), AO : 1.03%(σ = .001%)
email – M: 1.07% (σ = .01%), AO : .68%(σ = .007%)		I - NB: 1.91% (σ = .001%), AO : 1.12%(σ = .001%)
N/A – M: 1.16% (σ = .01%), AO : .02(σ = .0002%)		
feel – F: 2.76% (σ = .03%), AO : 1.28%(σ = .01%)		
manager – NB: 6.81% (σ = .06%), AO : .61%(σ = .0006%)		
Gratitude		
Unigrams	Bigrams	LIWC
wife – M: .99% (σ = .01%), AO : 0%(σ = 0%)	**safety home** – M: 2.15% (σ = .02%), AO : .02%(σ = .0002)	Focus on Present – M: 5.70% (σ = .01%), AO : 7.11%(σ = .01%)
peaceful – M: .88% (σ = .0009%), AO : .04%(σ = .0004%)	**with family** – M: .87% (σ = .009%), AO : 0%(σ = 0%)	Focus on Present – F: 6.84% (σ = .01%), AO : 5.91%(σ = .01%)
supportive – F: 1.53% (σ = .02%), AO : .49%(σ = .005%)	*had therapy* – NB: 1.55% (σ = .02%), AO : 0.00%	Focus on Present – NB: 10.70% (σ = .01%), AO : 6.12%(σ = .01%)

Asian participants described relationship-based difficulties, such as the unigram **collaboration**. Approximately 9.69% (σ = .09%) of SA entries discussing challenges used the term "collaboration", compared to only .27% (σ = .003) of entries from other participants. SA participants also uniquely described technical problems, including **vpn**, **infra issues**, and though not significant, **slow internet**, and **vpn disconnections**. Additionally, SA entries contained more work language, with an average of 13.81% (σ = .06) versus 7.5% (σ = .02) for non-SA entries ($p < 10^{-6}$). Our LIWC analysis contextualized these findings—while NA participants were more likely to have reflections on time in their discussed challenges, SA participants tended to use language around work, with 13.81% (σ = .06) of an average post being work language, whereas 7.5% of an average post (σ = .02) for non-SA participants, at $p < 10^{-6}$. This analysis demonstrates that how wellbeing is understood may influence how participants express their needs. NA and E&CA participants utilized more psychological terminology when speaking about workplace wellbeing challenges. In contrast, workplace wellbeing challenges were spoken about in social and technical terms by SA participants, which may speak to cultural differences in conceptualizations of wellbeing at work [61].

Expressions of gratitude also varied regionally. NA participants typically acknowledged the safety provided by working from home with phrases such as **safety home** and **working home**. SA participants highlighted their family's health and care, using unigrams like **health family** and **care health** that were not used by participants in the majority set. Participants from the Europe and Central Asia region placed value on their office's outdoor environment, such as the **garden**.

Our findings underscore how the framing of wellbeing and cultural contexts shape expression of experiences. NA and E&CA participants leaned towards individual perspectives, whereas SA participants focused more on social and technical perspectives. These regional differences point to varying conceptualizations of workplace wellbeing [61]. Furthermore, across demographics, the focus on family and environment in expressions of gratitude suggests that workplace wellbeing might extend beyond the individual to include collective aspects, tied to cultural context [65].

3.2.4 Identity-Based Differences. We now shift our focus towards another important aspect of wellbeing at work, gender identity. We find significant linguistic differences between different gender identities, detailed in Table 6.

We find that male diary study participants described challenges utilizing specific remote work technologies, such as **WFH**, **email**, and **calls**, and were also more likely to report no challenges, evidenced by the distinct use of the phrase **N/A**. When expressing gratitude, male participants

tended to highlight the comfort of their homes, including **safety (of) home** and **peaceful home**, and the importance of their social connections like **wife** and **with family**.

In contrast, female participants tended to discuss specific feelings about their work environment, including use of the words **feel** in entries about wellbeing challenges. Our LIWC analysis emphasizes this, with female participants employing "I" in 1.35% of a challenge response on average ($\sigma = .001$), compared to only 1.03% for non-females ($p < 10^{-6}$). Discussing social and emotional aspects of work was also observed in expressions of gratitude from female participants, where female participants described the need for a **supportive** environment (1.53% of entries), a figure significantly higher than that of non-female participants (.49% of entries, $p < 10^{-7}$). Our finding of distinct differences between male and female participants is suggestive of work from Hochschild [54] and Wharton [124] discussing how women take on additional emotional labor compared to men in the workplace. The use of words around emotion from female diary participants may be indicative of a perspective on wellbeing at work that includes the strain associated with emotional labor from female employees.

When discussing challenges, non-binary individuals often mentioned their **manager**, showing up in 6.81% of entries from non-binary participants, compared to only .61% from male and female participants. Additionally, non-binary participants frequently discussed their feelings through use of phrases such as **really hard** and **getting help**. Though not statistically significant, we do find that non-binary participants exhibited some unique language around gratitude, mentioning their mental health care experiences (e.g. **had therapy**) in 1.55% of entries.

Our findings demonstrate varying language around wellbeing at work among people of different gender identities. For all participants, however, social support from partners, family, or clinicians was crucial to their workplace wellbeing.

3.3 Implications

Our analysis of participant diary entries demonstrates how both demographic attributes (such as organizational group, cultural background, and gender identity) and the technology used for work (such as VPNs, remote desktop programs, and other technical infrastructure) are strongly related to participant experiences of wellbeing at work.

Across demographics, we find that expressions of wellbeing challenges were both physical and psychological, and how people experienced challenges were highly tied to the temporally changing contexts associated with the pandemic. In line with work in I-O and work psychology from Karasek [66] and Johnson [63] around strain and the buffering impact of social support, we find that diary study participants often mention their relationships with other people (including non-employees, e.g. family members or partners) as connected to their wellbeing at work.

However, looking across demographic groups, we find that the challenges participants expressed may have been reflective of diversity in how people conceptualize wellbeing at work. We find differences in expression to be tied to the demographic groups that people were a part of, but we also find that remote and hybrid work technologies play a strong role in people's experiences of wellbeing at work. Looking organizationally, this included more attention from hardware engineers around their commute to work, a unique requirement for hardware engineers during the pandemic, a consequence of the nature of their work. When examining cultural differences, we find that South Asian participants are less likely than North Americans and Europeans to describe wellbeing needs as individual experiences of distress, and more likely to discuss social aspects (such as collaboration or family members) and technical infrastructure (such as VPN tools) as important context to their wellbeing experience. Looking to gender identity, we see possible representation of the additional emotional labor that female employees have to take on in the workplace, as past research has noted [24, 49, 54, 124], including in a remote and hybrid context. This is in line with research from

Table 7. This table includes the demographic information of all interview participants. All names used are pseudonyms. We use the exact wording that participants used to describe different aspects of their identities. Some participant information is also anonymized if specific enough that it might make a participant identifiable.

Participant Name & Code	Race or Ethnicity	Gender Identity	Age	Job Type	Prior to Pandemic	During Pandemic	Location
Jørgen (P1)	White	Male	54	Technical Program Manager	Primarily Remote	Primarily Remote	Denmark
Conrad (P2)	Caucasian	Cis-ish	37	Research Technology Engineer	In Person	Hybrid with Significant In-Person Component	US — Far West
Shradhanjali (P3)	-	Female	36	Program Manager	In Person	Primarily Remote	India
Aileen (P4)	Asian-American	Female	38	Workplace State Manager	In Person	Hybrid with Significant In-Person Component	US — Mideast
Sanjana (P5)	Indian	Female	25	Software Engineer	In Person	Primarily Remote	India
Jay (P6)	Indian	Male	28	Software Engineer	In Person	Primarily Remote	India
Sai Pavan (P7)	Indian	Male	34	Facilities and Resource Management	In Person	In Person	India
Eugenio (P8)	Latino	Male	42	Solution Specialist Manager	In Person	Entirely Remote	Mexico
Christina (P9)	European	Female	38	Customer Success Manager	In Person	Primarily Remote	Ireland
Esther (P10)	Kenyan, Anonymized	Female	36	Receptionist	In Person	In Person	Kenya
Ahmed (P11)	Arab	Male	46	Director of Engineering	In Person	Hybrid	US — Mideast
Simone (P12)	Black	Female	32	Account Executive	In Person	Remote	US — Southwest
Sherman (P13)	Korean American	Male	49	Director	In Person	Primarily Remote	US — Northeast
Seymour (P14)	Anonymized	Male	46	Engineering Lead	In Person	Primarily Remote	Indonesia
David (P15)	Kenyan	Male	35	Security Guard	In Person	In Person	Kenya
Haljand (P16)	White Caucasian	Male	33	Senior Software Engineer	In Person	Hybrid	Estonia
Anne (P17)	White Caucasian	Woman	52	Business Program Manager	In Person	Entirely Remote	US — Far West
Michelle (P18)	Mexican and Italian	Female	52	Receptionist	In Person	In Person	US — Far West
Alexander (P19)	Caucasian	Male	28	Software Engineer	In Person	Hybrid	US — Far West
Emiliano (P20)	White	Male	46	Senior Consultant	In Person	Entirely Remote	Panama
Tony (P21)	Asian	Male	35 to 39	Software Engineer	In Person	Hybrid	US — Far West
Guo (P22)	Chinese	Male	47	Project Manager	In Person	Entirely Remote	China
Curtis (P23)	African	Male	40	Facility Manager	In Person	In Person	Kenya
Wendy (P24)	Kenyan	Woman	32	Food and Beverage Coordinator	In Person	In Person	Kenya
Rodrigo (P25)	White	Male	44	Customer Support Engineer	Primarily Remote	Primarily Remote	Portugal
Tyler (P26)	Two or more	Male	late 30s	Customer Support Account Manager	In Person	Primarily Remote	US — Southeast

CSCW demonstrating that offline gender dynamics around work can often be similarly propagated by collaborative technologies [3, 67].

We find differences in expression of wellbeing experiences and needs across diverse demographic groups. To understand the impact of these differences on how workers engage with their unique wellbeing needs, and the role of hybrid and remote work technologies in that process, we conduct an interview study to complement this analysis. We conduct semi-structured interviews with 26 employees at the same multinational company from which we recruited diary study participants. In the next section, we describe the daily lived experiences of these participants, drawing attention to how demographic differences influence wellbeing needs, and the role of remote and hybrid technologies in how diverse participants engage with their wellbeing.

4 EXAMINING LIVED EXPERIENCES WITH WORKPLACE WELLBEING

In this section, we add context to our observed differences in wellbeing expressions, and investigate and how they speak to differing conceptualizations of the workplace. We interview 26 workers from every continuously inhabited continent in the world, from a diversity of organizational groups, national and cultural groups, and unique identities. We interview participants recruited throughout the human infrastructure supporting work at a multinational technology company. In particular, we examine how ideas of workplace wellbeing among interview participants are constructed by interactions between identity-based individual factors, sociocultural backgrounds, and organizational factors.

4.1 Method and Analytical Approach

We begin by describing our process for selecting participants and the types of questions we asked. We then describe our method for analyzing the data. This study was also approved by our IRB.

4.1.1 Method. We interview 26 employees, from diverse nationalities, backgrounds, and employment types. A full listing of our participants with demographic information can be found in Table 7. Participants were recruited via a recruitment email advertising an interview study on workplace wellbeing that was sent out to different organizational groups within the company. Participants

were selected to ensure high levels of diversity with regard to the type of occupation, gender identity, nationality, and location. We determined location based on where the participants were interviewed were primarily located and working from at the time of interview. To ensure we understood the perspectives of those essential workers who supported remote and hybrid work, we intentionally reached out to groups that included essential workers, and used snowball sampling to recruit more participants from these groups.

All participant names are pseudonyms, and when we refer to them in the text, we include the pseudonym we have chosen as well as their participant code (as in Table 7). We utilize participant pseudonyms to humanize and avoid de-personalizing participants, and utilize participant pseudonyms that are sensitive to identity and culture, following past qualitative research [51]. Additionally, some participant information (such as ethnicity or community) is anonymized if specific enough that it might make a participant identifiable. Through our questions, we aimed to better understand how workers conceptualized workplace wellbeing, and how the move to remote may have changed their understanding and experiences with workplace wellbeing. To this end, questions included "What is wellbeing for you?" and "Were there differences you noticed between your move to remote work from that of your colleagues? From collaborators in other cities? In other countries?" Interviews were conducted over video calls over the course of July 2022 - August 2022. In the event that participants expressed any level of severe mental distress or seemed to be at risk of harm, the interviewer had access to a list of mental health resources to provide the participant if requested or needed. Additionally, all participants had access to transcripts of their interviews and had the ability to redact or change any information that did not seem in line with their lived experiences.

4.1.2 Analysis. To analyze the data, we used an inductive approach, organizing participant language into broader themes through an interpretative qualitative approach [87]. The first author conducted the initial open coding process, whereas themes were organized through continued discussions among all co-authors, conducting an iterative thematic analysis [22]. Some example codes included "comfort level with sensitive disclosures among teammates," "the role of government policies in wellbeing," "experiences of marginalization from essential workers," and "impact on colleagues," among others. We then iteratively organized these codes into broader themes, identifying three main themes. These themes were centered around the dynamic nature of individual wellbeing (theme name: *Dynamic Nature of Individual Wellbeing*), the culturally sensitive nature of support (theme name: *Culture and Support*), and differences in experience between essential and remote workers (theme name: *Experiences from Essential and Remote Workers*). In our findings, we discuss the role of these themes in how individuals understood and experienced their wellbeing at work. Each following section represents one of these themes, whereas each subsection represents one of the six (total) subthemes we identified. Specific participant quotes that were exemplars for each subtheme were chosen to more vividly illustrate participant experiences.

4.2 Individual Conceptualizations of Workplace Wellbeing

In this section, we describe how participants understood workplace wellbeing for themselves, and how this understanding of workplace wellbeing changed over the course of the COVID-19 pandemic, spurred on by the move to remote work.

4.2.1 Diversity in Conceptualizations of Workplace Wellbeing. Participants' conceptualizations of wellbeing were extremely diverse, including "*peacefulness*" (Tyler, P26), the feeling that one has "*delivered value to others*" (Guo, P22), and the "*ability to function*" (Sherman, P13). Participants used language around both physical and mental health to describe how they took care of their wellbeing, including seeking care from therapists, taking breaks to spend time with family and

friends, exercising, and participating in support groups. However, when asked to explain their understanding of workplace wellbeing, participants' answers were not as immediate or specific. As Jørgen (P1) succinctly put it:

> "Workplace wellbeing? Yeah, I mean, it's often the case that you don't really think about it all that much. But I'm sure you would know if you don't have it."—*Jørgen (P1)*

When asked further questions about what prevented negative experiences or poor wellbeing in the workplace, nearly all participant responses were centered around the need to be recognized as individuals, and the desire that their work has a tangible and recognizable positive impact on others. Just as in our quantitative analysis of linguistic differences between organizational groups, we found that occupation had an influence on how people evaluated the impact and conceptualized wellbeing. For example, Tony (P21), a software engineer, described wellbeing as when "*you were able to pinpoint the issue, find the fix for it, and make the fix happen*" for someone in need. David (P15), a security guard, highlighted the importance of having his humanity recognized for good workplace wellbeing:

> "[Workplace wellbeing] is appreciating, not demeaning, and acknowledging that I too am a human being, a colleague, a support person, and a key essential person. Because for most of the people, if we were not here, [workers at the company] would not feel safe or protected."— *David (P15)*

Similar to our findings in our quantitative analysis of organizational differences in wellbeing expressions (such as hardware engineers discussing **commute** as a unique wellbeing challenge), several participants noted how the nature of their work influenced whether and how they were able to take care of their wellbeing. For example, Tony (P21) mentioned the difficulties he experienced with an uncomfortable headset, noting that "*I think every night after work, I feel my skull*," and Anne (P17), a former administrative assistant, described how the international work hours of her manager influenced her own work-life balance due to time-zone differences. Though expressions of wellbeing were diverse, participants described a broader desire for their experiences in the workplace to be meaningful while not being straining, or as Ahmed (P11) put it, "*an enjoyable experience in addition to being a productive experience.*" We find this to be in line with work from Wrzesniewski et al. [127] emphasizing the importance of meaning for employee wellbeing, and work from Karasek [66] and Johnson [63] around the importance of reducing strain, even across diverse conceptualizations of wellbeing at work. However, we find that aspects of wellbeing at work took on new form during the rapid move to remote and hybrid work in March 2020.

4.2.2 Dynamic Wellbeing Needs During the Move to Remote. We found that the move to remote had a strong impact on participant wellbeing needs in the workplace. Participants described to us how the uncertainty of COVID restrictions in their respective countries influenced their overall morale. Guo (P22) described an initial excitement with the ability to work from home, one that quickly faded to a pessimism about society's ability to move past the virus to pre-pandemic times. Christina (P9) expressed feeling *"scared"* initially due to intermittent supply shortages, but also noted that people began *"caring about each other a bit more, all of a sudden"* as a result of collectively experiencing the unexperienced. This greater sense of care across individuals in the human infrastructure underlying work was something we also found in our linguistic analysis, with the phrase **take care** being a point of gratitude cited often by participants. This also aligned with our finding that social support from work and non-work sources was a particularly important wellbeing need (e.g. use of **family**, **team**, and **dog** by diary study participants)—several interview participants cited their friends and family members as a source of wellbeing during an uncertain time. However, the day-to-day uncertainty still was a major part of workplace wellbeing, and highlighted the extent to which

current events can influence how wellbeing needs change over time, as we observe in our diary analysis.

Workplace wellbeing, like workplace needs, was a dynamic concept for participants. For example, Shradhanjali (P3) described her unexpected experiences with postpartum depression during the pandemic, noting that the remote workspace ushered in by the pandemic helped her to realize the possibility that she could get support remotely while on maternity leave. The move to remote work also allowed some remote workers to experience new forms of workplace wellbeing that they had not experienced before. Anne (P17) described how she was able to set better workplace boundaries after transitioning from an administrative assistant role to a role that was remote:

> "You know, oddly enough, [the pandemic] has been freeing. I think I had spent so many years, 16 and a half, always being in the office, being the person that is always there, always on 24/7. And then to have that go away, and for me to be trusted to do my job from home on my own schedule, without the constraints of someone almost looking over my shoulder, it was freeing. I got so much more done. I learned more about myself. I got more organized. It was incredible."—*Anne (P17)*

Our diary study analysis demonstrated that technical tools used for remote work could cause physical wellbeing challenges, such as **back pain**. However, participants also mentioned that the always-connected nature of these tools led to mental wellbeing impacts. Rodrigo (P25) described how the move to remote meant a greater awareness of the human infrastructure he was part of as a worker, being constantly connected to coworkers and to the Internet. This had the unintended impact of "*always up to date on the news*" and making it difficult to escape the often demoralizing news airing regularly during 2020. Rodrigo described needing to take long walks regularly to cope with this newly found workplace stressor. Conrad (P2) described this stress being the reason he realized he might need therapy, and pursued virtual sessions, something that he had not considered prior to the pandemic. Similarly, Sanjana (P5) described how, during the particularly deadly second wave of the pandemic in India, she had to disconnect from technology to take care of her own wellbeing because she was "*so scared to pick up the call and hear bad news.*"

Participants also noted that the move to remote made it significantly more difficult to notice whether their coworkers might be having a tough time with their wellbeing. As Jay (P6) noted, *"if we are anxious over some things, or not properly focused, we are not able to concentrate, and it shows in our work and in our interactions."*. However, these attributes were difficult for participants to ascertain over technology-mediated chat services, especially given the stigma of openly talking about wellbeing concerns. The level of comfort with speaking openly about experiences with wellbeing with coworkers varied across teams, and was closely related to the culture of the countries the teams were based in.

4.3 Sociocultural Factors in Workplace Wellbeing

In this section, we discuss how social interactions created new conceptualizations of workplace wellbeing. Culture, identity, political context, and other aspects of social interactions influenced what people needed and were able to have for their wellbeing at work.

4.3.1 Support and Culture. In our diary study analysis, we found social relationships and social support to be a core part of wellbeing at work. Our interviews with participants confirmed this, and added further context, discussing the importance of the relationships they had with other people at work. As Seymour (P14) explained, "*[workplace wellbeing] is my day to day — how do I feel and how do I react to certain events in my life, and how does it influence my relationships with others or my work.*" Similarly, Eugenio (P8) couched his definition of workplace wellbeing in his relationships

with others, noting that "*I think, at the end of the day, we are built by relationships. So interacting with people is something that you miss, and you feel like you require.*"

In particular, participants noted that support from social relationships was exceptionally important for workplace wellbeing, whether that be from coworkers or from close friends outside of work. This follows work from Karasek [66] and Johnson [63] describing the importance of strong social support for wellbeing at work. However, culture had a strong influence on whether wellbeing was spoken about with coworkers or with close friends, and whether social support was sought out. Participants from Europe noted that it was extremely unlikely that they would openly discuss their wellbeing with their coworkers or manager, and only did so in extenuating or extreme circumstances. Jørgen (P1, from Denmark) attributed this behavior to culture, explaining that "*I value my colleagues, but I would never call them friends. For example, I would never be best friends with my boss.*" Similarly, Haljand (P16, from Estonia) highlighted the role of cultural stigma in what he disclosed to his team or manager because the disclosure of his mental health may lead to receiving potentially unfair treatment or reward. However, participants from Europe and Central Asia in our diary study described feeling **stressed** more than other participants. This may be a the consequence of less stigma associated with the private medium of the diary entry.

This separation between personal wellbeing and professional relationships reported by European participants was not generalizable to all participants, as participants from Central and South America (such as Eugenio, P8 and Emiliano, P20) described a very different climate. Eugenio described how, over the course of the pandemic, his manager would reach out to him directly daily to persistently ask how he was doing. As a result of those messages, Eugenio felt that he developed a "*relationship of confidence*" with his manager, one in which they were together able to discuss their hopes and fears about "*dealing with the pandemic forever*" and their events and experiences from their personal lives.

Guo (P22) described how it was surprising for him to see that international coworkers would openly discuss their COVID-19 diagnoses, even including them in their email or chat "Out of Office" messages. Guo attributed this to differences between Chinese culture and that of his colleagues, where stricter COVID restrictions in China meant that a positive COVID diagnosis could be shameful: "*your entire compound will be locked up. Or maybe the whole community will be locked up. So you'll feel a sense of shame if you get this.*"

In Indonesia, Seymour (P14) described the importance of ensuring that people feel comfortable advocating for their culturally diverse needs in the workplace *and* that technology accommodates the ability for individuals to express those needs. Seymour used the example of prayer times:

> "For me, setting up meetings is not only about knowing their lunch time or when they start or end work, but sometimes I also need to ask — 'is this your prayer time?' [...] We need to ensure that people feel comfortable to speak up and say 'Hey, this is my prayer time."'—*Seymour (P14)*

Over the course of the pandemic, technology-mediated chat and work communication platforms became a primary way for workers to be able to support one another in localized parts of the broader human infrastructure for our participants. For example, Michelle (P18), a receptionist, described her participation in internal chat support channels, created by receptionists for other receptionists. In these support channels, receptionists felt free to be open about their wellbeing experiences, including those specific to the emotional labor associated with being a receptionist. In several cases, Michelle became a sponsor for other individuals in the chat who were contending with substance use disorders. Similarly, Simone (P12) and Alexander (P19) described how their group of in-person friends from lunch quickly became an informal support group during the pandemic. This finding follows similar work from CSCW outside of a workplace context, demonstrating how interactive

technologies can support community building in terms of crisis [68], extending this perspective to different segments of the human infrastructure supporting work among our participants.

4.3.2 Context and Identity. Over the course of the last two years, current events intersected with the identities of participants, and had unique influences on workplace wellbeing. We find this in our analysis of diary entries, as reported challenges changed significantly between years based on the nature of the pandemic (such as **remote** or **WFH** in 2020, **vacation** in 2021, and **team members** in 2022). Our interviews shed light on individual context behind some of these temporal changes, highlighting the influence of current events on how people understood wellbeing at work.

Haljand (P16) described the impacts of the war in Ukraine on his workplace wellbeing:

> "I think things in the world really impact [workplace well-being]. Well, first came the pandemic, then came war in Ukraine. Because Ukraine is rather close to us, and we came from the same background. [...] So we relate to that topic a bit more."—*Haljand, P16*

Haljand described how the consequences of the war on his day-to-day life were primarily economic, with "*the high prices of electricity, the high prices of food, the overall prices of stuff [changing] a lot.*"

Similarly, Simone (P12) described how her identity as a Black woman influenced how she experienced current events, and their impact on her wellbeing. Simone spoke about specific differences between her and her colleagues in the wake of systematic killings of unarmed Black men in America:

> "I guess there's different things that I feel a lot of my colleagues cannot relate to that can affect my day-to-day mental health and my ability to do my job that day. So for example, I'm a mother, and I have a young son. And I have brothers, and cousins. And if there is what I consider a lynching, or someone has been killed without any justice, any jury, or anything — yeah, it just makes me take pause."—*Simone (P12)*

Similarly, as a mother, Simone described being shocked at little discussion around school shootings soon after they happened, and wished she had spaces to express her own anxieties and grief.

Current events could also create sudden and immediate wellbeing needs. Participants from India consistently described the overwhelmingly stressful nature of the second wave of the pandemic, which was particularly devastating in India [110]. Participants in India were grateful for company-sponsored chat channels to obtain supplies that were extremely limited, such as oxygen cylinders, medications, or consultations with doctors. Participants in India also noted that a main concern was the health and wellbeing of their families, in line with work from Hofstede around the role of collectivist culture in work experiences [55], and related empirical studies [65]. Sai Pavan (P7), a Facilities and Resource Management employee, noted that "*when COVID came, and we had to come to the office, we were thinking about our family members,*" knowing well that if he got COVID, it is likely that his family would as well. Sai Pavan's expressions of wellbeing needs were well aligned with those of our diary study participants from South Asia, who distinctly described the importance of their family in their entries. Sai Pavan found informal WhatsApp channels among other Facilities employees to be helpful in managing the stress and "*reducing the pressure*" associated with coming into the office daily.

Participants from Kenya also described the influence of current events on their experiences, particularly political events. Interviews happened to be conducted in the volatile and contested period following the 2022 elections in Kenya [123], which became a focal point of several interviews. David (P15) described his role monitoring the human infrastructure that remote workers were a part of, to support their safety, or what he called ensuring their "*continuity of wellbeing*":

> "I have to think about that — do you have everything that you need for your continuity of wellbeing? Yes or no? And if not, how can I help you? Are you in a situation where

there is a rowdy crowd or demonstration? Do you need to be evacuated? Do you need to be moved to a safer place? How can I step in and help?"—*David (P15)*

4.4 Organizational and Structural Factors in Workplace Wellbeing

In this section, we hone in on the differences we find between remote workers and essential workers in wellbeing needs, and describe the implications of what Wendy (P24) described as a "*segregation*" between the socioeconomic classes of workers at the workplace.

4.4.1 Human Infrastructures of Remote Work. During the move to remote, the participants in our study who were essential workers found themselves assigned new forms of work created to support new populations of remote workers. Though related to their areas of expertise, these new jobs were substantially different than what they had done in the past. For example, to support the individual wellbeing of remote workers, workers in Facilities and Resource Management (such as Sai Pavan, P7 or Curtis, P23) and Security (David, P15) were tasked with ensuring that supplies were delivered to remote employees stricken with COVID. To support the wellbeing of hybrid workers, staff trained in creating accessible office environments and designs conducive to wellbeing for technical workers (such as Aileen (P4)) were tasked with ensuring that office environments were well stocked with supplies to limit the spread of COVID-19 and support public hygiene. These essential workers formed part of the human infrastructure that facilitated the move to remote. The nature of the work being done came with unique wellbeing constraints tied to both the identities of the workers as well as the nature of the work they did.

Participants who were required to work in person saw the risks to their wellbeing (such as the potential for a greater level of COVID exposure) and their need to commute when others did not as a workplace stressor brought on by their work. However, the participants we interviewed did not necessarily see this as being any more or less intense than the isolation that remote workers experienced, and did not find them comparable. For example, Sai Pavan (P7) expressed his belief that both remote workers and in-person workers were under similar amounts of stress, but manifested in different ways. Esther (P10) expressed her belief that the isolation experienced by remote workers also uniquely influenced their ability to socialize and form a community with others when restrictions started to lift. Participants who did in-person work expressed an appreciation towards doing work that rose to the need of the hour, particularly when they were able to provide services to workers when traditional healthcare or governmental institutions seemed to be failing.

Though essential workers felt appreciative of the impact that they were able to have, they also felt dismayed by the protections afforded by their company to remote workers, but not to them. Esther noted her feelings during the very beginning of the pandemic:

> "Honestly, initially, we felt like it was very unfair. Because we are also human, and this virus is attacking human beings. So if some staff are getting to stay at home, what does it mean that we're here? Physically, that we can take the virus? Is that what they're trying to say?"—*Esther (P10)*

Participants who were in-person workers consistently expressed feeling like their time was not their own or that their work was only visible when in the context of others' needs, both before and during the pandemic. This was particularly the case when considering the additional emotional labor done by participants who had work that was front-facing and public. Esther described her experiences as a front office employee, and needing to "*mask*" when she was having difficult times:

> "Because of the length of time that I've been working in the front office, over time, we've learned to mask, so to speak, whatever it is. Because most of the time, you'll find that the people want you to chat it up, and you cannot do your job if you're grumpy or sad or teary."—*Esther (P10)*

Similarly, Michelle (P18) described the hardest part of her job being confrontations with individuals who were not vaccinated for COVID-19 and had no proof of a negative test, violating building policies. Michelle described situations in which these individuals complained to upper management, and it appeared that upper management did not appreciate the difficult nature of having to engage with a person around a sensitive public health and political issue.

These forms of emotional labor, when not given some form of relief or recognition, did have mental health consequences. Esther (P10) described *"kick the cat syndrome"* [4], or the idea that if not given a space to discuss and process the difficult feelings that come with emotional labor, workers might be irritable to others in their family or social circles. Esther elaborated, noting her belief that front office workers have a lot of trauma stemming from having people constantly *"dump their frustration"* on front office workers when their inquiry is not met. Esther (P10), Wendy (P24), Michelle (P18), and other in-person workers found it useful to have dedicated spaces to be able to discuss their experiences, both via engagements with therapy or with a support group.

Participants who were in-person workers also found it particularly helpful that their salaries were guaranteed when they were unable to work, and that they did not feel the threat of losing their job. Participants noted that these economic protections, as well as being given access to the same resources as remote workers (e.g., access to vaccines) was something that was extremely important for their workplace wellbeing.

4.4.2 Bridging Communities. Participants spoke of formal and informal divides and power differentials between in-person (often contingent) workers and technical (often remote) workers, in line with Hofstede's past work studying high power distance in the workplace, and its implications for marginalized workers [55]. Aileen (P4) described the work of her team as "*[creating] workplace physical environments, and systems, and services, so [employees] can do the best work of their careers,*" and described the immense passion that she and her team had for understanding how the nature of a given type of work might influence their surroundings. Aileen gave the example of engineers, who needed quiet spaces where they could focus and multiple monitors, and salespeople, who need more spaces to be able to collaborate quickly. Aileen noted her observations that the environment that people worked in, as tied to the nature of the work being done, was critical for workplace wellbeing, in line with Schein's writing on the importance of the built environment (i.e. artifacts) for a strongly connected organizational culture [113]. However, when asked what a productive and healthful environment might look like for her team members (and other contingent, in-person workers), Aileen responded:

> "I guess honestly, yeah, like I'm thinking about it now — our kitchen design, our back of house services, we don't really think about the environment it creates for them. We just think about the machinery that goes into it. [...] It's horrible to say, but we don't really consider their wellbeing, if I'm being very honest."—*Aileen (P4)*

Aileen explained that this was likely a consequence of the fact that many in-person workers tended to be contingent or temporary, and that designing for a transient workforce was significantly harder and not necessarily something her team was trained to do.

Divides between in-person essential workers and technical workers were both offline and online. Aileen described how members of her team would often work to set up wellbeing-related events for hybrid workers, but would not formally be able to participate in the events that they had set up. Similarly, several remote worker participants described how they would have e-meeting socials over the course of the pandemic to keep spirits high, but when asked whether essential workers were able to join, all said that they were not sure, and did not recall any essential workers joining. This

[4]This phenomenon is often called *displaced aggression* in psychology literature [84].

divide was noticed by in-person worker participants, with Wendy (P24) calling it a "*segregation*," and endorsing the idea that what is necessary is additional work "*to build community*" between essential workers who were in-person and workers who were primarily remote. As Wendy noted, "*it helps you to know the person and be like, 'yeah this is who this person is.' Titles are just titles. Wendy is a Food and Beverage coordinator, but that's not who she is, that's the job that she does.*"

While participants endorsed broader communities that included remote workers, participants also made it clear that specialized support groups and events restricted based on employment were important, particularly given unique factors influencing wellbeing. Michelle (P18) described how important a support chat for all lobby hosts was for their cohort. During the pandemic, there were activities and mentoring sessions between lobby hosts, and Michelle was clear that this gave them a space to discuss parts of their job that others may not understand. Michelle noted that she thought "it would have been harder for [lobby hosts] to engage with each other openly if it was a larger group." Similarly, Esther (P10) noted that a strong sense of solidarity was built between people who had to work in person during the pandemic, through supportive conversations:

> "To talk about these experiences, for the people who go to the office every day, it brought us closer. But for the people who were working remotely before, there's a distance."—*Esther (P10)*

In the wake of years of social distancing restrictions and isolation, participants (both remote and in-person) expressed a particular recognition for the importance of community across the human infrastructure in the context of workplace wellbeing.

5 DISCUSSION

In this study, we utilize two complementary data sources to analyze the role of organizational factors, cultural constraints, and individual context in how people experience their wellbeing at work. We investigate this question in light of the rapid shift to remote and hybrid work during the COVID-19 pandemic. As a result, we contribute implications towards creating more inclusive, multicultural, and healthy hybrid and remote workspaces, for *all* workers. We find meaningful differences between how participants from different demographic groups understand wellbeing through our linguistic analysis, and contextualize this diversity through our interview study, including how workers accommodate unique and differing wellbeing needs across a broad human infrastructure. We also highlight how remote and hybrid technologies may increase the divide between essential workers and information workers, and the importance of also centering the needs of a population that forms an essential part of the infrastructure supporting work. Below, we describe the implications of these findings for designers of collaborative workplace technologies, highlighting how designers can center diverse forms of worker wellbeing in the design of their tools, and opportunities for future work.

5.1 Centering Meaning

Designers of wellbeing tools for hybrid and remote work environments can support worker wellbeing by increasing the visibility of individual impact to colleagues and collaborators. Our participants identified feeling like the work that they did mattered, and that they made a tangible positive impact on the lives of others as integral to their workplace wellbeing, across diverse demographic groups. This is consistent with work and I-O psychology research emphasizing the criticality of impact and meaning for wellbeing at work [82], including foundational work from Wrzesniewski et al. [127] on how people integrate their impacts on others into a broader sense of self.

Our participants noted that the move to remote and hybrid workspaces made colleagues less able to check in on each other and express gratitude for impact, across remote, hybrid, and essential

workers. Research in HCI, I-O psychology, and management studies [88, 117] has described how the shift to remote and hybrid work caused a sudden loss of serendipitous office conversations. Building on this work, we note that the shift to remote and hybrid work also caused a loss of another important part of in-person workplace interactions—expressions of gratitude and impact across employees. These interactions were crucial for workers to understand their impact and derive meaning from it. Consequently, wellbeing tool designers must develop new methods for employees to perceive their work's impact on others within the wider work-supporting structure. **To center meaning in remote and hybrid workspaces, designers of worker wellbeing tools can design new mechanisms for workers to better understand the impact of their work on others, inclusive of the broader infrastructure supporting work.**

For instance, designers could offer employees periodic visualizations of their impact on others, in line with visualizations that track contributions to open source codebases [122]. Such visualizations could be generated from passively sensed data or digital work traces [28], or even through survey methods like our diary study. Colleagues could be prompted to report what they were most grateful for from their colleagues each week or month. This data could then be collated into a report for each worker, such that workers they know their impact on others even if they are not physically or geographically co-located, or in different organizational groups (such as across the information and essential worker divide). However, these technologies must also integrate meaningful and affirmative worker consent, to avoid the harms of additional workplace surveillance [21].

5.2 Supporting Community

Workplace wellbeing tool designers can enhance wellbeing in hybrid and remote environments by supporting the ability for workers to create private support groups and create community. Our analysis of diary entries showed frequent mentions of colleague interactions, underscoring the significance of social connections at work. Participant interviews further illuminated the essential role of spontaneous support groups that formed during the pandemic, from WhatsApp groups addressing sudden pandemic-related needs to job-specific chats, such as lobby host support groups. This finding is in line with Karasek's [66] and Johnson's [63] research emphasizing the importance of such social support for workplace wellbeing, which we find extends to hybrid and remote workspaces. Designers of collaborative workplace technologies could support the worker wellbeing of *all* workers by making it easier for individuals at companies to form these decentralized support groups and networks, independent of the official wellbeing programs that the company sponsors. Additionally, to bridge the high power distance [55] we found between remote workers, hybrid workers, and the essential workers that support them, essential workers could be invited to recurring online and offline socials among remote and hybrid workers. However, as highlighted in our diary entry analysis, the nature of the work being done (and power differentials associated with it) profoundly impacts the individual wellbeing needs of people who do that work.

It is thus extremely important to preserve and support the ability for essential workers to have private and secure spaces to have similar social events and discuss their unique wellbeing needs independent of broader remote and hybrid worker spaces. Our findings demonstrate the importance of being cognizant of the wellbeing needs of the essential workers who may be marginalized from participating in wellbeing programs, but form a core part of the human infrastructure supporting work. **Specific and careful collaborative technology design that is attentive to hierarchy, division, and diversity within the human infrastructure supporting work is critical to protect the wellbeing of *all* workers.** Such an approach can ensure that essential workers continue to have their wellbeing needs considered, even as workplaces become more remote.

5.3 Supporting Cross-Cultural Wellbeing

Through our analysis of diary entries, we found cultural differences in workplace wellbeing needs between separated demographic groups. Through our interviews with workers, we developed a better understanding of what happens when workers from diverse cultures collaborate with each other in digital workspaces. Past work in CSCW has described a high level of cultural homophily in multicultural spaces [98], particularly in the workplace context [32]. Our findings demonstrate a different reality, one in which workers utilize technology and understanding of cultural differences to ensure the wellbeing of people who may be different in background to their own.

For example, Seymour (P14) described the importance of feeling comfortable asking about the prayer times of his Muslim colleagues, but also ensuring his colleagues felt comfortable speaking up about their prayer times, to schedule meetings without difficulty. Designers of hybrid and remote worker wellbeing tools can build on this principle, following Schein's three aspects of organizational culture [112, 113], with multiculturalism as a shared value, empathy as a shared assumption, and collaborative technologies as shared artifacts. **Designers must both support inclusive digital environments for people to talk about cultural differences, *and* also design collaboration tools to support transparency around culturally-specific wellbeing needs.**

We find several opportunities for future design, including the differences in emotional closeness among employees in various global regions. European participants felt uncomfortable getting too close to colleagues, whereas South and Central American participants felt uncomfortable *not* getting close to their colleagues. It is an open question for future CSCW research to address designing wellbeing tools for hybrid and remote workers that cross-cultural, but also take into account conflicting cultural norms and needs across an expansive human infrastructure.

5.4 Designing for Dynamic Worker Wellbeing

In our diary entry analysis and in our interview study, we find that diary study participants describe challenges in staying motivated and getting started working each day. Through our interview study, we find that these concerns are particularly intense during times of acute stress, including shortages of health supplies related to the COVID-19 pandemic, concerns about family health, and concerns about emerging conflicts. Participants described to us what helped them stay well during these stressful events was feeling cared about by their workplace, whether that meant through a guaranteed income during times of uncertainty, support with gathering supplies that were difficult to find, or observing a greater closeness among the people around them. As we find in our temporal analysis of diary entries, current events strongly influenced the wellbeing needs of workers. **Hybrid and remote worker wellbeing tools must thus be designed to be dynamic and malleable to meet the needs of the day, as workplace wellbeing needs can change dynamically based on changing contexts.** We encourage designers to center the impact of current events and context on workplace wellbeing tools. This may be operationalized through greater avenues for workers to report their wellbeing needs, and tools to quickly analyze these responses and develop responsive and adaptive policies.

5.5 Conceptualizing Wellbeing

Our diary study analysis reveals significant variation in how participants express their wellbeing needs, with responses shaped by identity, culture, and organizational affiliation. For instance, participants in North America and Europe & Central Asia tended to frame their concerns psychologically, while South Asian participants more commonly used language linked to social connections and technical infrastructure. Our observations also highlighted a focus on family from diary study and

interview participants in the Global South, corroborating Hofstede's research on work experiences in collectivist cultures [56], and related empirical studies [61, 65]).

This may have been the result of cultural differences in how participants understood the questions being asked, linked to cultural differences in how participants understood what fit within the boundaries of wellbeing at work. This was reflected in our interview study, with participants describing cultural differences in what they believed they could discuss about their wellbeing at work, such as the contrast between employees in Europe and in South America. The idea that the wording of our question may have influenced how people thought they could discuss their wellbeing is in line with past research from global mental health. For example, Kleinman and Kleinman [72] find that people in the Global South often use physical distress frames when discussing their wellbeing, and psychological frames if the context or wording of the question changes. Hence, the cultural variations we notice might stem from different interpretations of wellbeing inquiries among global participants. **To be inclusive of diverse conceptualizations of wellbeing at work, future research and practice can utilize open-ended methods of asking about worker wellbeing.** For example, designers of workplace wellbeing tools could begin wellbeing survey tools with a short description of how their organization understands workplace wellbeing. With this definition as context, they could then ask participants questions about challenges and points of gratitude during their day, and see if this results in different and less heterogenous answers. Additionally, providing an option for responses in native languages might reveal additional insights, given that our study was confined to English expressions.

We evaluated culture at a national level, but local organizational cultures likely also influenced our findings, and is a place for further research. Our research was limited to the multinational organization we chose, as we wanted to get a sense of the broader human infrastructure underlying the work produced by the company. However, other organizations likely have different occupational groups, organizatonal cultures, and levels of worker diversity. Future research could thus consider companies that are more homogenous in terms of type of employment (to look more specifically at national culture) or sample workers from various companies within one country (to examine organizational culture). We utilize nationality as a proxy for culture, but culture can be extremely localized or extremely broad. In line with work from Schein [112, 113] around organizational culture, and utilizing Hofstede's cultural dimensions theory [55, 56], future work in CSCW can build on our research to study how micro-cultures within the broader human infrastructure develop, and the role of co-location or synchronous work on that process, following the CSCW matrix [62].

6 CONCLUSION

The rapid transition to remote and hybrid work during the pandemic has opened the door to closer collaboration among workers, across borders and diverse identities. This transition provides a new opportunity for workers to bridge boundaries and develop a better understanding and a sense of community with people they may have never met otherwise. However, in the pursuit of supporting worker wellbeing in a more connected world, it is necessary for organizations to understand how wellbeing needs differ across populations, and integrate this diversity in collaborative workplace technologies. In this study, we explore how organizational, cultural, and individual factors impact workers' perception of their wellbeing needs amidst the move to remote and hybrid work. We describe how designers can support a inclusive worker wellbeing, one that is cognizant of unique needs and cultural gaps, resilient in the face of change, and united by a shared commitment to wellbeing for all workers.

7 ACKNOWLEDGEMENTS

This research was conducted at Microsoft Research. We are deeply grateful to our participants for their time and willingness to share their lived experiences with us. We also thank our reviewers for their valuable feedback. This work would not have been possible if not for the support of researchers across the Human Understanding and Empathy (HUE) group at Microsoft Research and beyond—we thank them for their guidance.

REFERENCES

[1] Annette Adler, Anuj Gujar, Beverly L Harrison, Kenton O'hara, and Abigail Sellen. 1998. A diary study of work-related reading: design implications for digital reading devices. In *Proceedings of the SIGCHI conference on Human factors in computing systems*. 241–248.

[2] Daniel A Adler, Emily Tseng, Khatiya C Moon, John Q Young, John M Kane, Emanuel Moss, David C Mohr, and Tanzeem Choudhury. 2022. Burnout and the Quantified Workplace: Tensions around Personal Sensing Interventions for Stress in Resident Physicians. *Proceedings of the ACM on Human-Computer Interaction* 6, CSCW2 (2022), 1–48.

[3] Benjamin Ale-Ebrahim, Tristan Gohring, Elizabeth Fetterolf, and Mary L Gray. 2023. Pronouns in the Workplace: Developing Sociotechnical Systems for Digitally Mediated Gender Expression. *Proceedings of the ACM on Human-Computer Interaction* 7, CSCW1 (2023), 1–30.

[4] Alberta A Ansah, Yilun Xing, Amudha Varshini Kamaraj, Diana Tosca, Linda Boyle, Shamsi Iqbal, Andrew L Kun, John D Lee, Michel Pahud, and Orit Shaer. 2022. " I need to respond to this"–Contributions to group creativity in remote meetings with distractions. In *2022 Symposium on Human-Computer Interaction for Work*. 1–12.

[5] Maral Babapour Chafi, Annemarie Hultberg, and Nina Bozic Yams. 2021. Post-pandemic office work: Perceived challenges and opportunities for a sustainable work environment. *Sustainability* 14, 1 (2021), 294.

[6] Jennifer L Berdahl and Celia Moore. 2006. Workplace harassment: double jeopardy for minority women. *Journal of applied psychology* 91, 2 (2006), 426.

[7] Pernille Bjørn. 2016. New fundamentals for CSCW research: From distance to politics. *Interactions* 23, 3 (2016), 50–53.

[8] Pernille Bjørn, Morten Esbensen, Rasmus Eskild Jensen, and Stina Matthiesen. 2014. Does distance still matter? Revisiting the CSCW fundamentals on distributed collaboration. *ACM Transactions on Computer-Human Interaction (TOCHI)* 21, 5 (2014), 1–26.

[9] Stephen Bochner and Beryl Hesketh. 1994. Power distance, individualism/collectivism, and job-related attitudes in a culturally diverse work group. *Journal of cross-cultural psychology* 25, 2 (1994), 233–257.

[10] Adam Brown and Ana C Leite. 2022. The effects of social and organizational connectedness on employee well-being and remote working experiences during the COVID-19 pandemic. *Journal of Applied Social Psychology* (2022).

[11] Barry AT Brown, Abigail J Sellen, and Kenton P O'hara. 2000. A diary study of information capture in working life. In *Proceedings of the SIGCHI conference on Human factors in computing systems*. 438–445.

[12] Christine V Bullen and Robert Johansen. 1988. Groupware, a key to managing business teams? (1988).

[13] United States Census Bureau. 2022. The Number of People Primarily Working From Home Tripled Between 2019 and 2021. (2022).

[14] Ronald Busse, Seungwoo Kwon, Hans-Arno Kloep, Koustab Ghosh, and Malcolm Warner. 2018. Toward a "meaningful self" at the workplace: Multinational evidence from Asia, Europe, and North America. *Journal of Leadership & Organizational Studies* 25, 1 (2018), 63–75.

[15] Hancheng Cao, Chia-Jung Lee, Shamsi Iqbal, Mary Czerwinski, Priscilla NY Wong, Sean Rintel, Brent Hecht, Jaime Teevan, and Longqi Yang. 2021. Large scale analysis of multitasking behavior during remote meetings. In *Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems*. 1–13.

[16] Robert D Caplan. 1975. *Job demands and worker health: Main effects and occupational differences*. US Department of Health, Education, and Welfare, Public Health Service ....

[17] Melissa Cefkin, Obinna Anya, Steve Dill, Robert Moore, Susan Stucky, and Osariemo Omokaro. 2014. Back to the future of organizational work: crowdsourcing and digital work marketplaces. In *Proceedings of the companion publication of the 17th ACM conference on computer supported cooperative work & social computing*. 313–316.

[18] Haiqian Chen, Leiyu Shi, Yuyao Zhang, Xiaohan Wang, Jun Jiao, Manfei Yang, and Gang Sun. 2021. Respond to the COVID-19 pandemic: strategies comparison in six countries. *Frontiers in Public Health* (2021), 1420.

[19] Felix O Chima. 2006. Integrating traditional organizational behavior theories and issues for employee assistance practice. *Journal of Workplace Behavioral Health* 21, 2 (2006), 59–77.

[20] Janghee Cho, Samuel Beck, and Stephen Voida. 2022. Topophilia, Placemaking, and Boundary Work: Exploring the Psycho-Social Impact of the COVID-19 Work-From-Home Experience. *Proceedings of the ACM on Human-Computer Interaction* 6, GROUP (2022), 1–33.

[21] Shreya Chowdhary, Anna Kawakami, Mary L Gray, Jina Suh, Alexandra Olteanu, and Koustuv Saha. 2023. Can Workers Meaningfully Consent to Workplace Wellbeing Technologies?. In *Proceedings of the 2023 ACM Conference on Fairness, Accountability, and Transparency*. 569–582.

[22] Victoria Clarke, Virginia Braun, and Nikki Hayfield. 2015. Thematic analysis. *Qualitative psychology: A practical guide to research methods* 3 (2015), 222–248.

[23] Courtney Nanette Coles. 2019. *The Effect of Employee Assistance Programs (EAPs) on Behavioral Healthcare Utilization: The Role of Race/Ethnicity*. University of California, Los Angeles.

[24] Shelley J Correll. 2001. Gender and the career choice process: The role of biased self-assessments. *American journal of Sociology* 106, 6 (2001), 1691–1730.

[25] Rosemary Crompton and Clare Lyonette. 2006. Work-life 'balance'in Europe. *Acta sociologica* 49, 4 (2006), 379–393.

[26] Mary Czerwinski, Eric Horvitz, and Susan Wilhite. 2004. A diary study of task switching and interruptions. In *Proceedings of the SIGCHI conference on Human factors in computing systems*. 175–182.

[27] Maitraye Das, John Tang, Kathryn E Ringland, and Anne Marie Piper. 2021. Towards accessible remote work: Understanding work-from-home practices of neurodivergent professionals. *Proceedings of the ACM on Human-Computer Interaction* 5, CSCW1 (2021), 1–30.

[28] Vedant Das Swain, Victor Chen, Shrija Mishra, Stephen M Mattingly, Gregory D Abowd, and Munmun De Choudhury. 2022. Semantic Gap in Predicting Mental Wellbeing through Passive Sensing. In *CHI Conference on Human Factors in Computing Systems*. 1–16.

[29] Munmun De Choudhury, Michael Gamon, Scott Counts, and Eric Horvitz. 2013. Predicting depression via social media. In *Seventh international AAAI conference on weblogs and social media*.

[30] Munmun De Choudhury, Sanket S Sharma, Tomaz Logar, Wouter Eekhout, and René Clausen Nielsen. 2017. Gender and cross-cultural differences in social media disclosures of mental illness. In *Proceedings of the 2017 ACM conference on computer supported cooperative work and social computing*. 353–369.

[31] Julie Dextras-Gauthier and Alain Marchand. 2018. Does organizational culture play a role in the development of psychological distress? *The International Journal of Human Resource Management* 29, 12 (2018), 1920–1949.

[32] Wei Dong, Kate Ehrlich, Michael M Macy, and Michael Muller. 2016. Embracing cultural diversity: Online social ties in distributed workgroups. In *Proceedings of the 19th ACM conference on computer-supported cooperative work & social computing*. 274–287.

[33] Ryan D Duffy, Blake A Allan, Kelsey L Autin, and Elizabeth M Bott. 2013. Calling and life satisfaction: it's not about having it, it's about living it. *Journal of counseling psychology* 60, 1 (2013), 42.

[34] Michaelanne Dye, David Nemer, Josiah Mangiameli, Amy S Bruckman, and Neha Kumar. 2018. El Paquete Semanal: The Week's Internet in Havana. In *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems*. 1–12.

[35] Anne-Laure Fayard. 2019. Notes on the meaning of work: Labor, work, and action in the 21st century. *Journal of Management Inquiry* (2019), 1056492619841705.

[36] Marilyn J Field, Harold T Shapiro, et al. 1993. Origins and evolution of employment-based health benefits. In *Employment and Health Benefits: A Connection at Risk*. National Academies Press (US).

[37] Kiva A Fisher, Samantha M Olson, Mark W Tenforde, Leora R Feldstein, Christopher J Lindsell, Nathan I Shapiro, D Clark Files, Kevin W Gibbs, Heidi L Erickson, Matthew E Prekker, et al. 2020. Telework before illness onset among symptomatic adults aged 18 years with and without COVID-19 in 11 outpatient health care facilities—United States, July 2020. *Morbidity and Mortality Weekly Report* 69, 44 (2020), 1648.

[38] Louise F Fitzgerald. 1993. Sexual harassment: Violence against women in the workplace. *American Psychologist* 48, 10 (1993), 1070.

[39] World Economic Forum. 2021. Global Gender Gap Report 2021. (2021).

[40] Sarah E Fox, Vera Khovanskaya, Clara Crivellaro, Niloufar Salehi, Lynn Dombrowski, Chinmay Kulkarni, Lilly Irani, and Jodi Forlizzi. 2020. Worker-centered design: Expanding HCI methods for supporting labor. In *Extended abstracts of the 2020 CHI conference on human factors in computing systems*. 1–8.

[41] Susan Gallagher, Asha Roy, Sandra J Domeracki, Todd Mohrmann, Vicki Missar, Janet Jule, Shreela Sharma, and Ryan DeWitt. 2021. The low-wage essential worker: Occupational concerns and needs in the COVID-19 pandemic—A round table. *Workplace Health & Safety* 69, 4 (2021), 154–160.

[42] Anuj Gangopadhyaya and A Bowen Garrett. 2020. Unemployment, health insurance, and the COVID-19 recession. *Urban Institute)* (2020).

[43] Eleni Georganta, Claudia Peus, and Jasmin Niess. 2023. Interactive technologies through the lens of team effectiveness: an interdisciplinary systematic literature review. *European Journal of Work and Organizational Psychology* (2023), 1–16.

[44] Sucheta Ghoshal and Amy Bruckman. 2019. The role of social computing technologies in grassroots movement building. *ACM Transactions on Computer-Human Interaction (TOCHI)* 26, 3 (2019), 1–36.

[45] Muriel Gray and Daniel Lanier Jr. 1985. Designing employee assistance programs to meet the needs of Black clients. *Alcoholism Treatment Quarterly* 2, 3-4 (1985), 85–96.
[46] Mary L Gray and Siddharth Suri. 2019. *Ghost work: How to stop Silicon Valley from building a new global underclass*. Eamon Dolan Books.
[47] Mary L Gray, Siddharth Suri, Syed Shoaib Ali, and Deepti Kulkarni. 2016. The crowd is a collaborative network. In *Proceedings of the 19th ACM conference on computer-supported cooperative work & social computing*. 134–147.
[48] Jonathan Grudin. 1994. Computer-supported cooperative work: History and focus. *Computer* 27, 5 (1994), 19–26.
[49] Catherine Hakim. 1998. Developing a sociology for the twenty-first century: Preference Theory. *The British journal of sociology* 49, 1 (1998), 137–143.
[50] Luke Haliburton, Pawel W Wozniak, Albrecht Schmidt, and Jasmin Niess. 2021. Charting the Path: Requirements and Constraints for Technology-Supported Walking Meetings. *Proceedings of the ACM on Human-Computer Interaction* 5, CSCW2 (2021), 1–31.
[51] Janet Heaton. 2022. "*Pseudonyms are used throughout": a footnote, unpacked. *Qualitative Inquiry* 28, 1 (2022), 123–132.
[52] James D Herbsleb, Daniel J Paulish, and Matthew Bass. 2005. Global software development at siemens: experience from nine projects. In *Proceedings of the 27th international conference on Software engineering*. 524–533.
[53] Joni Hersch and W Kip Viscusi. 1996. Gender differences in promotions and wages. *Industrial Relations: A Journal of Economy and Society* 35, 4 (1996), 461–472.
[54] Arlie Russell Hochschild. 1979. Emotion work, feeling rules, and social structure. *American journal of sociology* 85, 3 (1979), 551–575.
[55] Geert Hofstede. 1984. *Culture's consequences: International differences in work-related values*. Vol. 5. sage.
[56] Geert Hofstede, Gert Jan Hofstede, and Michael Minkov. 2005. *Cultures and organizations: Software of the mind*. Vol. 2. Mcgraw-hill New York.
[57] Mo Houtti, Moyan Zhou, Loren Terveen, and Stevie Chancellor. 2023. " All of the White People Went First": How Video Conferencing Consolidates Control and Exacerbates Workplace Bias. *Proceedings of the ACM on Human-Computer Interaction* CSCW (2023).
[58] Tianran Hu, Haoyuan Xiao, Jiebo Luo, and Thuy-vy Thi Nguyen. 2016. What the language you tweet says about your occupation. In *Tenth International AAAI Conference on Web and Social Media*.
[59] Magid Igbaria. 1999. The driving forces in the virtual society. *Commun. ACM* 42, 12 (1999), 64–70.
[60] Kazushi Ikeda and Keiichiro Hoashi. 2017. Crowdsourcing GO: Effect of worker situation on mobile crowdsourcing performance. In *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems*. 1142–1153.
[61] Akanksha Jaiswal and C Joe Arun. 2020. What comprises well-being at workplace? A qualitative inquiry among service sector employees in India. *South Asian Journal of Business and Management Cases* 9, 3 (2020), 330–342.
[62] Robert Johansen. 1988. *Groupware: Computer support for business teams*. The Free Press.
[63] Jeffrey V Johnson. 1989. Collective control: Strategies for survival in the workplace. *International Journal of Health Services* 19, 3 (1989), 469–480.
[64] Rasmus Leth Jørnø, Karsten Gynther, and Ove Christensen. 2013. Challenging the CSCW matrix: a rough draft of a new conceptualisation of collaborative practices in learning environments. *Open Learning: The Journal of Open, Distance and e-Learning* 28, 3 (2013), 239–254.
[65] Suraj Kapoor, Patrick C Hughes, John R Baldwin, and Janet Blue. 2003. The relationship of individualism–collectivism and self-construals to communication styles in India and the United States. *International Journal of Intercultural Relations* 27, 6 (2003), 683–700.
[66] Robert A Karasek Jr. 1979. Job demands, job decision latitude, and mental strain: Implications for job redesign. *Administrative science quarterly* (1979), 285–308.
[67] Matthew Kay, Cynthia Matuszek, and Sean A Munson. 2015. Unequal representation and gender stereotypes in image search results for occupations. In *Proceedings of the 33rd annual acm conference on human factors in computing systems*. 3819–3828.
[68] Ryan M Kelly, Yueyang Cheng, Dana McKay, Greg Wadley, and George Buchanan. 2021. "it's about missing much more than the people": how students use digital technologies to alleviate homesickness. In *Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems*. 1–17.
[69] Vera Khovanskaya, Lynn Dombrowski, Jeffrey Rzeszotarski, and Phoebe Sengers. 2019. The Tools of Management: Adapting Historical Union Tactics to Platform-Mediated Labor. *Proceedings of the ACM on Human-Computer Interaction* 3, CSCW (2019), 1–22.
[70] Molly Kinder. 2020. Essential but undervalued: Millions of health care workers aren't getting the pay or respect they deserve in the COVID-19 pandemic. *Brookings Institution* (2020).
[71] Molly Kinder and Laura Stateler. 2021. They Deserve a $15 Minimum Wage: Essential workers comprise about half of all workers in low-paid occupations. *Brookings Institution* (2021).

[72] Arthur Kleinman and Joan Kleinman. 1985. Somatization: The Interconnections in Chinese Society among Culture, Depressive Experiences, and the Meanings of Pain. *Culture and depression: Studies in the anthropology and cross-cultural psychiatry of affect and disorder* 16 (1985), 429.

[73] Kevin M Kniffin, Jayanth Narayanan, Frederik Anseel, John Antonakis, Susan P Ashford, Arnold B Bakker, Peter Bamberger, Hari Bapuji, Devasheesh P Bhave, Virginia K Choi, et al. 2021. COVID-19 and the workplace: Implications, issues, and insights for future research and action. *American Psychologist* 76, 1 (2021), 63.

[74] The World Bank Knowledgebase. 2022. World Bank Country and Lending Groups. (2022).

[75] Siew Tim Lai and Ronan E O'Carroll. 2017. 'The Three Good Things'–The effects of gratitude practice on wellbeing: A randomised controlled trial. *Health Psychology Update* 26, 1 (2017), 10–18.

[76] Simiran Lalvani and Joyojeet Pal. 2022. The Moral Orders of Matchmaking Work: Digitization of Matrimonial Services and the Future of Work. *Proceedings of the ACM on Human-Computer Interaction* 6, CSCW1 (2022), 1–23.

[77] Airi Lampinen, Victoria Bellotti, Coye Cheshire, and Mary Gray. 2016. CSCW and theSharing Economy: The Future of Platforms as Sites of Work Collaboration and Trust. In *Proceedings of the 19th ACM Conference on Computer Supported Cooperative Work and Social Computing Companion*. 491–497.

[78] Moritz Langner, Peyman Toreini, and Alexander Maedche. 2022. EyeMeet: A Joint Attention Support System for Remote Meetings. In *CHI Conference on Human Factors in Computing Systems Extended Abstracts*. 1–7.

[79] Ahreum Lee, Austin L Toombs, Ingrid Erickson, David Nemer, Yu-shen Ho, Eunkyung Jo, and Zhuang Guo. 2019. The social infrastructure of co-spaces: Home, work, and sociable places for digital nomads. *Proceedings of the ACM on human-computer interaction* 3, CSCW (2019), 1–23.

[80] Charlotte P Lee, Paul Dourish, and Gloria Mark. 2006. The human infrastructure of cyberinfrastructure. In *Proceedings of the 2006 20th anniversary conference on Computer supported cooperative work*. 483–492.

[81] Minha Lee, Wonyoung Park, Sunok Lee, and Sangsu Lee. 2022. Distracting Moments in Videoconferencing: A Look Back at the Pandemic Period. In *CHI Conference on Human Factors in Computing Systems*. 1–21.

[82] P Litchfield. 2021. Workplace wellbeing. *Perspectives in Public Health* 141, 1 (2021), 11–12.

[83] Daulatram B Lund. 2003. Organizational culture and job satisfaction. *Journal of business & industrial marketing* 18, 3 (2003), 219–236.

[84] Amy Marcus-Newhall, William C Pedersen, Mike Carlson, and Norman Miller. 2000. Displaced aggression is alive and well: a meta-analytic review. *Journal of personality and social psychology* 78, 4 (2000), 670.

[85] Gloria Mark, Shamsi Iqbal, Mary Czerwinski, and Paul Johns. 2014. Capturing the mood: facebook and face-to-face encounters in the workplace. In *Proceedings of the 17th ACM conference on Computer supported cooperative work & social computing*. 1082–1094.

[86] Dale A Masi. 2020. The history of employee assistance programs in the United States.

[87] Sharan B Merriam and Robin S Grenier. 2019. *Qualitative research in practice: Examples for discussion and analysis*. John Wiley & Sons.

[88] Jessica R Methot, Emily H Rosado-Solomon, Patrick E Downes, and Allison S Gabriel. 2021. Office chitchat as a social ritual: The uplifting yet distracting effects of daily small talk at work. *Academy of Management Journal* 64, 5 (2021), 1445–1471.

[89] Evan M Mistur, John Wagner Givens, and Daniel C Matisoff. 2020. Contagious COVID-19 policies: Policy diffusion during times of crisis. *Review of Policy Research* (2020).

[90] Phoebe V Moore. 2019. OSH and the future of work: benefits and risks of artificial intelligence tools in workplaces. In *International Conference on Human-Computer Interaction*. Springer, 292–315.

[91] Hadar Nesher Shoshan and Wilken Wehrt. 2022. Understanding "Zoom fatigue": a mixed-method approach. *Applied Psychology* 71, 3 (2022), 827–852.

[92] Gary M Olson and Judith S Olson. 2000. Distance matters. *Human–computer interaction* 15, 2-3 (2000), 139–178.

[93] Judith S Olson, Erik C Hofer, Nathan Bos, Ann Zimmerman, Gary M Olson, Daniel Cooney, and Ixchel Faniel. 2008. A theory of remote scientific collaboration. *Scientific collaboration on the internet* (2008), 73–97.

[94] Hiroshi Ono. 2018. Why do the Japanese work long hours. *Sociological perspectives on long working hours in Japan. Japan Labor* 2 (2018).

[95] World Health Organization et al. 2020. Coronavirus disease 2019 (COVID-19): situation report, 72. (2020).

[96] Giuseppe Francesco Papalia, Giorgia Petrucci, Fabrizio Russo, Luca Ambrosio, Gianluca Vadalà, Sergio Iavicoli, Rocco Papalia, and Vincenzo Denaro. 2022. COVID-19 Pandemic Increases the Impact of Low Back Pain: A Systematic Review and Metanalysis. *International Journal of Environmental Research and Public Health* 19, 8 (2022), 4599.

[97] Sachin R Pendse, Faisal M Lalani, Munmun De Choudhury, Amit Sharma, and Neha Kumar. 2020. " Like Shock Absorbers": understanding the human infrastructures of technology-mediated mental health support. In *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems*. 1–14.

[98] Sachin R Pendse, Kate Niederhoffer, and Amit Sharma. 2019. Cross-Cultural Differences in the Use of Online Mental Health Support Forums. *Proceedings of the ACM on Human-Computer Interaction* 3, CSCW (2019), 1–29.

[99] James W Pennebaker, Ryan L Boyd, Kayla Jordan, and Kate Blackburn. 2015. *The development and psychometric properties of LIWC2015.* Technical Report.
[100] Yada Pruksachatkun, Sachin R Pendse, and Amit Sharma. 2019. Moments of change: Analyzing peer-based cognitive support in online mental health forums. In *Proceedings of the 2019 CHI conference on human factors in computing systems*. 1–13.
[101] Michael Quinlan. 1997. The toll from toil does matter: Occupational health and labour history. *Labour History* (1997), 1–29.
[102] Jakkula V Rao and K Chandraiah. 2012. Occupational stress, mental health and coping among information technology professionals. *Indian journal of occupational and environmental medicine* 16, 1 (2012), 22.
[103] Noopur Raval and Joyojeet Pal. 2019. Making a" Pro":'professionalism'after platforms in beauty-work. *Proceedings of the ACM on Human-Computer Interaction* 3, CSCW (2019), 1–17.
[104] Talma Rosenthal and Ariela Alter. 2012. Occupational stress and hypertension. *Journal of the American Society of Hypertension* 6, 1 (2012), 2–22.
[105] Anna Rudnicka, Dave Cook, Marta E Cecchinato, Sandy JJ Gould, Joseph W Newbold, and Anna L Cox. 2022. The end of the active work break? Remote work, sedentariness and the role of technology in creating active break-taking norms. In *2022 Symposium on Human-Computer Interaction for Work*. 1–13.
[106] Koustuv Saha, Sang Chan Kim, Manikanta D Reddy, Albert J Carter, Eva Sharma, Oliver L Haimson, and Munmun De Choudhury. 2019. The language of LGBTQ+ minority stress experiences on social media. *Proceedings of the ACM on human-computer interaction* 3, CSCW (2019), 1–22.
[107] Koustuv Saha, Asra Yousuf, Louis Hickman, Pranshu Gupta, Louis Tay, and Munmun De Choudhury. 2021. A social media study on demographic differences in perceived job satisfaction. *Proceedings of the ACM on Human-Computer Interaction* 5, CSCW1 (2021), 1–29.
[108] Jean Michel Sahut and Raphael Lissillour. 2023. The adoption of remote work platforms after the Covid-19 lockdown: New approach, new evidence. *Journal of Business Research* 154 (2023), 113345.
[109] Niloufar Salehi, Lilly C Irani, Michael S Bernstein, Ali Alkhatib, Eva Ogbe, and Kristy Milland. 2015. We are dynamo: Overcoming stalling and friction in collective action for crowd workers. In *Proceedings of the 33rd annual ACM conference on human factors in computing systems*. 1621–1630.
[110] Udani Samarasekera. 2021. India grapples with second wave of COVID-19. *The Lancet Microbe* 2, 6 (2021), e238.
[111] Nithya Sambasivan and Thomas Smyth. 2010. The human infrastructure of ICTD. In *Proceedings of the 4th ACM/IEEE international conference on information and communication technologies and development*. 1–9.
[112] Edgar H Schein. 1990. *Organizational culture*. Vol. 45. American Psychological Association.
[113] Edgar H Schein. 2010. *Organizational culture and leadership*. Vol. 2. John Wiley & Sons.
[114] Bhavani Seetharaman, Joyojeet Pal, and Julie Hui. 2021. Delivery Work and the Experience of Social Isolation. *Proceedings of the ACM on Human-Computer Interaction* 5, CSCW1 (2021), 1–17.
[115] Kerry Segrave. 1994. *The sexual harassment of women in the workplace, 1600 to 1993*. McFarland Jefferson, NC.
[116] Ellen Simpson and Bryan Semaan. 2021. For You, or For" You"? Everyday LGBTQ+ Encounters with TikTok. *Proceedings of the ACM on human-computer interaction* 4, CSCW3 (2021), 1–34.
[117] Jaeyoon Song, Christoph Riedl, and Thomas W Malone. 2021. Online Mingling: Supporting Ad Hoc, Private Conversations at Virtual Conferences. In *Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems*. 1–10.
[118] Franchesca Spektor, Estefania Rodriguez, Samantha Shorey, and Sarah Fox. 2022. AI and essential labor: representing the invisible work of integration. *XRDS: Crossroads, The ACM Magazine for Students* 28, 2 (2022), 16–19.
[119] Guy Standing. 2014. The Precariat. *Contexts* 13, 4 (2014), 10–12. https://doi.org/10.1177/1536504214558209
[120] Norman Makoto Su and Gloria Mark. 2008. Designing for nomadic work. In *Proceedings of the 7th ACM conference on Designing interactive systems*. 305–314.
[121] Gina Venolia, Tom Erickson, John Tang, Ben Mazza, and Susan Herring. 2014. Lifestyle teleworkers speak out!. In *Proceedings of the companion publication of the 17th ACM conference on Computer supported cooperative work & social computing*. 117–120.
[122] Lucian Voinea, Alex Telea, and Jarke J Van Wijk. 2005. CVSscan: visualization of code evolution. In *Proceedings of the 2005 ACM symposium on Software visualization*. 47–56.
[123] Declan Walsh, Abdi Latif Dahir, and Matthew Mpoke Bigg. 2022. After a Bitter Contest, Kenyan Opposition Leader Rejects Election Result. *The New York Times* (2022).
[124] Amy S Wharton. 1999. The psychosocial consequences of emotional labor. *The annals of the american academy of political and social science* 561, 1 (1999), 158–176.
[125] Alex C Williams, Gloria Mark, Kristy Milland, Edward Lank, and Edith Law. 2019. The perpetual work life of crowdworkers: How tooling practices increase fragmentation in crowdwork. *Proceedings of the ACM on Human-Computer Interaction* 3, CSCW (2019), 1–28.

[126] Edward N Wolff. 2005. The growth of information workers in the US economy. *Commun. ACM* 48, 10 (2005), 37–42.
[127] Amy Wrzesniewski, Clark McCauley, Paul Rozin, and Barry Schwartz. 1997. Jobs, careers, and callings: People's relations to their work. *Journal of research in personality* 31, 1 (1997), 21–33.
[128] Huichuan Xia, Yang Wang, Yun Huang, and Anuj Shah. 2017. " Our Privacy Needs to be Protected at All Costs" Crowd Workers' Privacy Experiences on Amazon Mechanical Turk. *Proceedings of the ACM on Human-Computer Interaction* 1, CSCW (2017), 1–22.
[129] Chi-Lan Yang, Naomi Yamashita, Hideaki Kuzuoka, Hao-Chuan Wang, and Eureka Foong. 2022. Distance Matters to Weak Ties: Exploring How Workers Perceive Their Strongly-and Weakly-Connected Collaborators in Remote Workplaces. *Proceedings of the ACM on Human-Computer Interaction* 6, GROUP (2022), 1–26.
[130] Longqi Yang, David Holtz, Sonia Jaffe, Siddharth Suri, Shilpi Sinha, Jeffrey Weston, Connor Joyce, Neha Shah, Kevin Sherman, Brent Hecht, et al. 2022. The effects of remote work on collaboration among information workers. *Nature human behaviour* 6, 1 (2022), 43–54.

Received January 2023; revised July 2023; accepted November 2023