The Impact of Organizational Citizenship Behaviors on Technostress in a Post-COVID-19 Remote Work Context: The Role of Media Synchronicity

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Abstract

The COVID-19 pandemic led to a rapid shift to remote work, resulting in changes in work practices that have caused increased stress and reduced wellbeing among employees. Existing research on technostress primarily focuses on stressors stemming from primary job demands, neglecting the impact of voluntary, extra-role behaviors such as organizational citizen behaviors. To bridge this gap, this study proposes and tests a model that investigates the effects of technology-mediated extra-role behavior on employee productivity and wellbeing in a work-from-home setting. The study identifies three mechanisms through which extra-role behavior adversely influences employee wellbeing: psychological transition, interruption overload, and task closure. Furthermore, the study proposes that the relationship between extra-role behavior and employee wellbeing and productivity is contingent upon the synchronicity of the information communication technology (ICT) platforms.

Keywords: Technostress, OCB, Remote Work, Extra-role Behaviors

1. Introduction

One of the grand challenges that have faced organizations in recent years is the unprecedented COVID-19 pandemic which disrupted long-established norms and practices in knowledge work, prompting an abrupt shift towards digitally organized work (Wang et al., 2020). As a consequence of the COVID-19 pandemic, Gartner projected a rise in remote-working employees from 30% to 48% in 2020, (Granieri, 2020). As of 2022, in the United States, the percentage of individuals who primarily work from home increased threefold, rising from approximately 9 million people, or 5.7%, to 27.6 million people, or 17.9% (Bureau, 2022). Central to this adaptation of the new remote work paradigm are information communication technologies, (ICT), which shape and support organizational work practices (Avgar et al., 2018). For example, recent post-COVID-19 research has shown that knowledge work is associated with heavy reliance on ICT, which has challenges for traditional work practices such as ICT-enabled job crafting, teamwork, collaborations, and citizenship behaviors (Smith et al., 2020; Tarafdar & Saunders, 2022; Wang et al., 2020). This research has also demonstrated that, while valuable, the reliance on ICTs to carry out common work practices is increasingly associated with technostress (Benlian, 2020; Duxbury et al., 1992; Magni et al., 2022; Tarafdar & Saunders, 2022).

Technostress is defined as stress experienced by end users in organizations as a result of their use of information technologies (Ragu-Nathan et al., 2008, p. 418). Recent research has shown that technostress encompasses multiple facets, such as distress and eustress (Califf et al., 2020; Tarafdar et al., 2019). The emphasis of this research is that technostress is not an inherently dark side phenomenon. This research suggests that individual and organizational factors play a significant role in determining whether IS are perceived as threatening or challenging. Based on the primary appraisals, individuals enact coping responses or evaluations of IS as either a challenge or a threat. When technostress is perceived as a challenge, individuals employ challenge responses, resulting in positive outcomes. This is the eustress process. Conversely, when stressors are seen as threats, individuals employ threat coping responses, which lead to negative outcomes. This is the distress process. Further research has identified several psychological outcomes related to certain work practices e.g., agile information systems development practices (ISDP), on employee wellbeing (Benlian, 2020). Others have examined the effects of technology-related factors on job satisfaction, attrition, turnover intention, organizational commitment, and continuance (Califf et al., 2020; Ragu-Nathan et al., 2008). While this line of research has illuminated our understanding of how technology and organizational practices affect employees, much has largely focused on stressors associated with in-role task demands (Califf et al., 2020), and little attention has been paid to the impact of technology on employees' stress levels emanating from extra-role behaviors, an example of organizational citizenship behaviors (OCB).

OCB are discretionary, voluntary behaviors exhibited by employees that go beyond their formal job roles and are beneficial to the organization. They are not directly or explicitly recognized by the formal reward system, but in the aggregate promote the

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effective functioning of the organization (Organ, 1988). Examples of OCB include guiding colleagues with new tasks, accepting extra responsibilities, and voicing concerns for the organization's welfare. Some scholars argue that informal behaviors such as OCB are a fundamental and "necessary prerequisite for effective collaboration" because they "facilitate the functioning of the formal organization" (Harvey et al., 2018, p. 52). Prior research shows that OCB practices are associated with positive and negative consequences. On the positive side, engaging in OCB has been linked to improved manager ratings, increased salary, promotions, public recognition, and opportunities for high-profile positions (Allen & Rush, 1998; Bergeron, 2007; Podsakoff et al., 2009) . On the negative side, however, OCB behaviors such as individual initiative, which require additional time and effort, can result in job stress, role overload, work-family conflict, and even turnover intentions. Moreover, the pressure to engage in OCB can also lead to job stress, work-family conflict, and decreased job satisfaction, particularly among employees who lack support from their organization (Bolino et al., 2015; Bolino & Turnley, 2005; Bolino et al., 2010). This double-edged sword nature of OCB presents a dilemma to employees, especially in the remote work context where the lack of visibility of employees to supervisors may make employees feel even a greater need to go the extra mile for favorable promotive, recognition, and prosocial outcomes. At the same time, however, these practices may increase stress for employees. Furthermore, given the reliance on ICT when working remotely, employees face the additional challenge of determining which communication medium to use for engaging in citizenship behaviors. Therefore, we also examine how the synchronicity of ICT impacts employees' psychological and behavioral strain, manifested as fatigue and individual productivity.

In their recent review, (Marsh et al., 2022) lament over the prevalent assumption in technostress studies that are primarily in a physical office setting. In this study, the authors highlight the need for future research to address the specificity of the work context. OCB serves as a notable example of work practices predominantly examined within the framework of a traditional office setting. However, emerging research recognizes the importance of investigating how employees engage in OCB while working remotely from home. This research suggests that while OCB remains valuable for overall organizational success, certain aspects may vary between office and remote settings (Smith et al., 2020). For example, in remote settings, the lack of physical presence may result in reduced visibility of employees' extra efforts, making it challenging for supervisors to recognize and reward OCB. This underscores the necessity to understand and explore the unique dynamics and challenges associated with carrying out OCB in an ICT-enabled remote work environment.

To this end, our study has two objectives. First, we build and test a model that investigates the effects of technology-mediated OCB on employee wellbeing and productivity when working from home. We propose that OCB is negatively related to employee wellbeing through three mechanisms: psychological transition, interruption overload, and task closure (Chen & Karahanna, 2018). In doing this, the study contributes to the technostress literature (Califf et al., 2020; Cram et al., 2022; Maier et al., 2022; Tarafdar & Saunders, 2022) by examining whether and how extra-role work practices contribute to technostress above and beyond in-role primary tasks and additional work from home stressors. Second, we posit that the relationship between OCB and employee wellbeing and productivity is moderated by the synchronicity of the digital communication platform. Moreover, the study contributes to the OCB literature (Bergeron, 2007; Bolino, 1999; Bolino & Grant, 2016; Bolino et al., 2015; Bolino & Turnley, 2005; Harvey et al., 2018; Organ, 1988; Smith et al., 2020) by examining the role of technology as either an inhibitor or exacerbator of the personal costs of OCB in the remote work context. The study is guided by the following research questions:

RQ1: *To what extent does using information communication technology to go above and beyond the call of duty affect employee wellbeing and productivity when working from home?*

RQ2: *To what extent does the synchronicity of information communication technology moderate the relationship between extra-role behavior and employee wellbeing as well as their productivity?*

2. Relevant Work
2.1. OCB and Technostress

OCB practices typically manifest in behaviors such as individual initiative, loyalty, helping other coworkers, sportsmanship, civic virtue, compliance, and many others (Harvey et al., 2018). Although there has been considerable research on OCB, most has focused primarily on OCB conducted in conventional office work settings, (Bateman & Organ, 1983; Grant & Mayer, 2009; Morrison, 1994). Recent studies have recognized the need to expand the conceptualization of OCB to specify the work context, i.e., OCB-H - doing OCB while physically at home, and OCB-W - performing OCB while physically at work (Smith et al., 2020). According to Smith and colleagues, OCB-W demonstrates a different nomological network from OCB-H. Additionally, although studies have shown that going above and beyond in organizations can lead

to emotional exhaustion, (Eissa & Lester, 2018) and citizenship fatigue (Bolino et al., 2015), we still don't fully understand the mechanisms by which this takes place.

In this study, we consider a specific context of work practices that employees frequently engage in, i.e., technology-mediated interpersonal helping (TMIH). Interpersonal helping is a form of a broader construct of OCB, which is defined as "promotive behavior that emphasizes small acts of consideration" (Van Dyne & LePine, 1998, p. 109). Van Dyne and LePine (1998) highlight the importance of considering the multidimensionality of the OCB construct by examining specific types of OCB behaviors. According to Van Dyne and LePine (1998) helping behaviors foster positive relationships and prioritize interpersonal harmony. Such behaviors can manifest in various ways, such as guiding colleagues with new tasks or procedures, assisting in problem-solving, sharing knowledge, and more. This conceptualization allows for a contextualized understanding of the role of TMIH in the remote work context. It offers a new lens for studying how employees operate in a technology-mediated work environment for several reasons. First, helping coworkers is a voluntary behavior, and employees neither get formal rewards nor punishment for such behavior. Second, employees likely already experience stressors due to the sudden and unexpected move to remote work with little to no preparation, additional responsibilities, home-related stressors, and lack of social interactions, which may all together contribute to stress. Third and lastly, as indicated by Bolino (1999) and Organ (1988), OCB are not typically part of formal employee training, which means that employees may need to navigate a learning curve associated with performing OCB virtually in addition to their regular job tasks while working remotely. While our study focuses on interpersonal helping, it's important to recognize that other forms of OCB have been examined in prior literature, including individual initiatives, assuming extra responsibilities, staying well-informed about the organization, and advocating for it. We selected to examine TMIH due to our study's objective of verifying the validity of the OCB-strain-stress link within an ICT-enabled work context.

2.2. The Role of Media Synchronicity

Previous research has examined various moderators of technostress, including organizational and technical support, employee involvement in new ITC implementation, technology self-efficacy, and individual appraisal of technostress (Ragu-Nathan et al., 2008; Tarafdar et al., 2019; Tarafdar et al., 2015; Tarafdar et al., 2011). However, the impact of media synchronicity on technostress remains underexplored, despite its relevance in the context of phenomena like "zoom fatigue" (Bailenson, 2021).

Knowledge work typically involves frequent switching between cognitive tasks, each of which calls for a different range of mental abilities (Monsell, 2003). When using technology to collaborate for work, it can be hypothesized that task switching may be even more cognitively taxing, hence this study also takes the synchronization of the communication media into account. "Media synchronicity theory (MST) focuses on the ability of media to support synchronicity, a shared pattern of coordinated behavior among individuals as they work together" (Dennis et al., 2008). MST proposes that two fundamental communication processes are relevant to all tasks: 1) conveyance processes, which include the transmission of as much new, diverse, and relevant information as needed to enable the receiver to create a shared mental model, and 2) Convergence processes which are an individual's interpretation of a situation. The main goal of convergence is to reach a common understanding. According to Dennis et al. (2008), "for the conveyance processes, use of media supporting lower synchronicity should result in better communication performance. For convergence processes, the use of media supporting higher synchronicity should result in better communication performance". MST is relevant in the context of technology-mediated extra-role behaviors because employees who engage in extra-role tasks such as helping other employees encounter additional background convergence and conveyance processes that require a "cognitive ability to analyze information, making sense of it and to build mental models" necessary for a shared understanding.

As implied by MST, the communication process assumes two parties, i.e., transmitters, who mainly engage in conveyance processes, and receivers, who engage primarily in convergence processes. However, it is important to note that both participants simultaneously switch between convergence and conveyance processes at varying degrees. However, with interpersonal helping, one party (i.e., the employee who offers help) is likely to engage in conveyance rather than convergence primarily. While the cognitive demands of convergence depend on how quickly one reaches an understanding, conveyance processes are typically more cognitively demanding because it requires not only the creation of meaning, but also "an understanding of how others interpret it" (p. 580). For this reason, this study asserts that, depending on the communication media, offering help to a coworker may be cognitively taxing to employees.

DeSanctis and Poole (1994) posit that the physical characteristics of the communication medium do not matter as much as how the user appropriates those characteristics. Hence, effective communication media usage can produce positive or negative outcomes

depending on how well tasks are matched to the media. Positive results can be expected when communication media is appropriated such that there is less interruption overload, shorter psychological transition, and quicker task closure (Chen & Karahanna, 2018). This assertion is supported by research on affordance actualization, which posits that to reap the benefits of IT, it is important to examine the specific context of the use of IT.

2.3. The Role of Interruption Overload, Psychological Transition, and Task Closure

There are a number of conditions that induce technostress including techno-invasion, techno-overload, techno-uncertainty, techno-insecurity, and techno-complexity (Ragu-Nathan et al., 2008). However, we chose to focus on three mechanisms that we consider more relevant within the context of ICT-enabled OCB behaviors, with a particular emphasis on media synchronicity. In this study, we propose that OCB is a resource-depleting extra-role task that leads to helping fatigue and reduced individual productivity (strain) based on three stress-inducing mechanisms: interruption overload, psychological transition, and task closure. In the context of OCB, we adapt (Chen & Karahanna, 2018)'s definition of interruption overload as the state in which individuals have more helping-related interruptions than they can adequately handle in their work domain. Psychological transition, on the other hand, is the psychological movement between in-role tasks and extra-role helping tasks, including disengagement from one domain and engagement in another. Lastly, according to Straub and Karahanna (1998), task closure refers to the concluding stage of a communication transmission segment, marked by its successful completion. In this study, we conceptualize task closure as the extent to which helping coworkers facilitates or inhibits the completion of one's in-role work-related tasks.

3. Hypothesis Development

Prior research has shown that extra-role behaviors such as helping employees or providing feedback require disengagement from one task to another, requiring workers to switch between in-role and extra-role tasks (Sonnentag & Bayer, 2005). Task switching is not only cognitively and emotionally taxing but may also result in increased task variety which can increase stress levels for employees. Additionally, when employees engage in extra-role behaviors, they may take on additional tasks and responsibilities that can create interruptions in their workday. Moreover, when employees engage in extra-role behaviors, they may find it more challenging to complete their primary responsibilities, leading to a decrease in task closure.

Therefore, we posit that:

Hypothesis 1: *TMIH frequency is positively related to a) interruption overload, b) psychological transition, and c) negatively related to task closure.*

Hypothesis 2: *TMIH duration is positively related to a) interruption overload, b) positively related to psychological transition, and c) negatively related to task closure.*

Frequent interruptions may lead to interruption overload which is likely to decrease employees' ability to complete tasks efficiently. For example, when employees engage in extra-role behaviors, they may be interrupted more frequently by colleagues or superiors who need their assistance. This may make it challenging for employees to focus on their primary responsibilities. Demerouti et al. (2014) found that interruptions at work can have negative effects on job performance and employee wellbeing. Prior research has found that frequently, individuals try to make up for interruptions by increasing their work pace, however, this comes at a cost: it can lead to heightened stress levels, greater frustration, and increased time pressure (Mark et al., 2008).

Hypothesis 3: *Interruption overload is a) positively related to helping fatigue and b) negatively related to individual productivity.*

Psychological transition between in-role and extra-role tasks is a cognitively taxing task that likely depletes employees limited mental resources. When an employee engages in extra-role behaviors, they may need to switch between different tasks more frequently, leading to increased psychological transition. Each time an employee switches tasks, they need to mentally prepare themselves for the new task, decreasing overall productivity. For example, Mark et al. (2008) found that task switching can lead to decreased productivity and increased errors.

Hypothesis 4: *Psychological transition is a) positively related to helping fatigue and b) negatively related to individual productivity.*

Task closure is important for maintaining productivity and avoiding helping fatigue. When employees are able to complete tasks and move on to the next one, they are more likely to maintain their momentum and avoid feeling overwhelmed (Mark et al., 2008). However, when employees engage in extra- role behaviors, they may take on tasks that are not formally assigned to them, leading to feelings of lack of closure on their primary tasks. This can create a feeling of unfinished business and increase job stress. Therefore, if employees are unable to bring their primary tasks to completion before taking voluntary extra-role tasks, they are likely to feel

more fatigued and less productive. Therefore, we posit that:

Hypothesis 5: *Task closure is a) positively related to helping fatigue and b) negatively related to individual productivity.*

Regardless of the work context, it is generally expected that any form of in-role task **interruption** will cause stress to employees. However, in addition to the frequency and duration of interruptions, there may be certain nuances related to the communication media used. While MTS posits that media with low synchronicity generally leads to better communication performance, there is a paradox that comes with the frequency of high exposure synchronous communication. A growing number of studies are associating high synchronous communication media such as Zoom as associated with fatigue, a concept known as Zoom fatigue (Bailenson, 2021; Fosslien & Duffy, 2020; Wiederhold, 2020). Asynchronous communication, on the other hand, may allow employees what (Chen & Karahanna, 2018) called "intelligent interruption management", (p.31) i.e., giving them time to decide whether and when to help thus reducing the interruption of in-role tasks. Similarly, media low in synchronicity may facilitate psychological transition leading to lower helping fatigue. However, if a coworker chooses a high synchronous media like videoconferencing, this may increase fatigue. Therefore, this study adds that, the more helping is offered through synchronous communication (regardless of duration and frequency), the more likely the employee is to experience helping fatigue than when using asynchronous communication.

Hypothesis 6: *TMIH is positively related to helping fatigue.*

Hypothesis 6a: *Media synchronicity positively moderates the relationship between TMIH and helping fatigue, such that the relationship is strengthened when media is synchronous.*

Prior research asserts that while helping others can have many benefits, such as increased job satisfaction, a sense of purpose, and improved relationships with coworkers, it has similarly been associated with emotional exhaustion and burnout, leading to reduced productivity. This study hypothesizes a negative relationship between technology-mediated helping and individual productivity. We further posit that this relationship is moderated by media synchronicity. For example, when offering help to others, it is important to balance their needs with one's own responsibilities and deadlines. However, constant synchronous communication can blur these boundaries and make it difficult to allocate time and resources efficiently, resulting in decreased productivity.

Hypothesis 7: *TMIH is negatively related to productivity.*

Hypothesis 7a: *Media synchronicity negatively moderates the relationship between TMIH and productivity, such that productivity will be even lower when media is synchronous.*
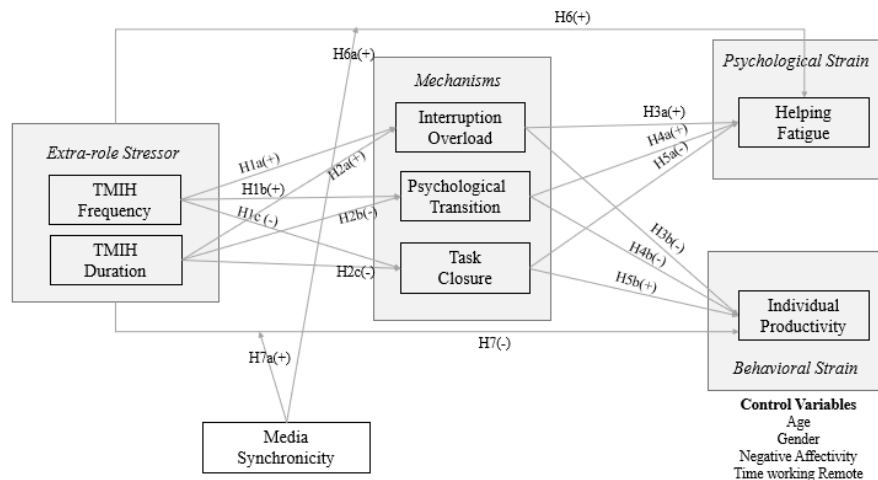

Figure 1. Proposed Research Model

4. Research Method
1.1. Sample and Procedure

To achieve our objectives, we used a survey research method. A survey link was sent via an online research platform, Prolific, a popular psychological and behavioral research site. To participate, subjects had to work remotely, use technology-mediated communication consistently, and use technology to participate in OCB. Participants were either part-time (i.e., 30 hours or more a week) or full-time knowledge workers. To target knowledge workers, participants were asked to specify both their respective industries and job titles. Job titles included a diverse range, spanning from consultants, analysts, designers, specialists, engineers, to writers. Our decision to

include knowledge workers in our study was based on the premise that knowledge work requires a diverse set of skills, such as critical thinking and problem-solving. Additionally, we hold the assumption that the primary objective of knowledge work is to generate value for the organization, which can manifest in a multitude of ways, including the development of products or the provision of services (IBMEducation). All measures were adapted from prior validated scales. An initial amount of 288 responses were obtained, of which 25 responses were eliminated due to incomplete responses. We also eliminated participants who failed one or both attention checks. The resulting dataset comprised 263 valid responses. About 45 percent of the participants were male. The average age was 39 years old. Subjects came from a wide range of industries, including accommodation, financial services, trucking, and others.

1.2. Measures

In previous studies, supervisor ratings have frequently been used to evaluate OCB; however, with remote work, these ratings may not be viable since it's difficult to observe TMIH behaviors without visibility. Hence, the study relied on self-reported measures. To operationalize TMIH, we used measures adapted from (Van Dyne & LePine, 1998), which were rephrased to fit the technology-mediated context. We focused on both the frequency and duration of TMIH. Participants were asked how often they engage in each of the behaviors while working from home. Example items were: "I help others in my work group learn about their work. I assist others in my group with their work for the benefit of my workgroup. I help orient my new coworkers in my work group." Items for *interruption overload, psychological transition, and task closure* were adapted from (Chen & Karahanna, 2018). These items were also adapted to fit the remote work context and interpersonal helping. To measure *helping fatigue,* employees were asked to respond to a helping fatigue scale adapted from (Bolino et al., 2015)'s citizenship fatigue scale. These items were also adapted to fit a technology-mediated work context. *Individual productivity* was measured using items from (Magni et al., 2022). *Media Synchronicity* was measured using a binary variable, with 0 indicating asynchronous and 1 indicating synchronous media. Participants were asked to indicate the form of communication media they frequently use to help their coworkers during a typical workday while working from home. According to (Dennis et al., 2008) high synchronicity has been defined as media that provide high feedback and low concurrency" (p. 53). In this present study, we classify high synchronicity as videoconferencing with two levels: videoconferencing and videoconferencing with screen sharing (SWS). We operationalize low synchronicity as written communication media such as emails. Lastly, we control for several variables including negative affectivity, which has been shown to influence stress and strain (Bolino & Turnley, 2005). We also control for gender (0-male, 1-female), age, and the amount of time that employees have been working remotely.

1.3. Testing for Bias

To assess common methods bias, we followed Kock and Lynn (2012)'s recommendation by using a random variable. In our case, we used the variable attitude to the color blue (Miller & Simmering, 2022). The factor-level (or inner model) VIFs were all less than the threshold of 3.3., which suggests that CMB did not pose a significant threat to our study. Because our study involved constructs where participants were likely to present themselves in a positive light, we also tested for social desirability bias. We used a 13-item scale from (Reynolds, 1982). The correlations between the social desirability scale and all constructs were weak, ranging between -0.20 and 0.13, indicating that social desirability bias was not a significant threat to the study.

5. Results

The proposed hypotheses were tested using Partial Least Squares (PLS) structural equation modeling. Because the study also tests moderation, the analyses were run on mean-centered, normalized data. Before testing the proposed path model, we established the validity and reliability of the measures employed in the study. All constructs exhibited good validity and reliability. The average variance extracted (AVEs) ranged between (0.710 – 0.910) which is above the suggested threshold of 0.5. Similarly, the factor loadings were above 0.7 for all items except for one item from the TMIH frequency scale, which was 0.682. Composite reliability ranged between (0.871 – 0.977) and Cronbach alphas ranged between and (0.871 - 0.975) respectively which are above the recommended 0.7. All these results suggest the validity and reliability of our measurement model. After establishing the measurement model, we ran the structural model.

Hypotheses 3, 5, and 7 were supported. Hypotheses 1, 2, 4, 6a, and 7a were partially supported. Hypothesis 6 was not supported. See Table 2 for a summary of all the results. We start by discussing the results of the interaction effects. Two of our moderation hypotheses were supported. The findings of the interaction effects indicate that the relationship between TMIH duration and helping fatigue is stronger when employees use synchronous media compared to asynchronous media. Likewise, media synchronicity was observed to moderate the negative relationship

between TMIH frequency and productivity. Notably, when employees use highly rich synchronous media, with screen sharing (SWS), their productivity significantly decreases, while it increases when they do not use synchronous media with screen sharing. Figure 2 is a summary of the interaction effects.

The findings from the path analysis support our hypotheses in several ways. Firstly, TMIH duration was positively and significantly related to interruption overload (β = 0.215, p<0.01). However, this relationship was not significant for the other paths associated with TMIH duration examined. Similarly, TMIH frequency was positively and significantly related to interruption overload (β=0.143, p< 0.01). Contrary to our expectations that increased TMIH frequency would decrease productivity, our results indicate that it enhanced productivity (β = 0.282,

p<0.001). Besides these paths, TMIH frequency was not significant for interruption overload, psychological transition, and task closure.

The proposed mechanisms had varying effects on technostress related strains. Firstly, interruption overload had a significant positive effect on the experience of helping fatigue (β=0.453, p< 0.001) and a significant negative association with productivity (β= -0.184, p< 0.01). Similarly, *psychological transition* was unexpectedly found to be positively related to productivity (β=0.173, p< 0.01), contradicting our prediction of reduced productivity. Lastly, as hypothesized, task closure had a positive relationship to helping fatigue and was negatively related to productivity (β=0.173, p< 0.01) and (β=0.173, p< 0.01). The results of the structural model are presented in Table 1 and Figure 3.
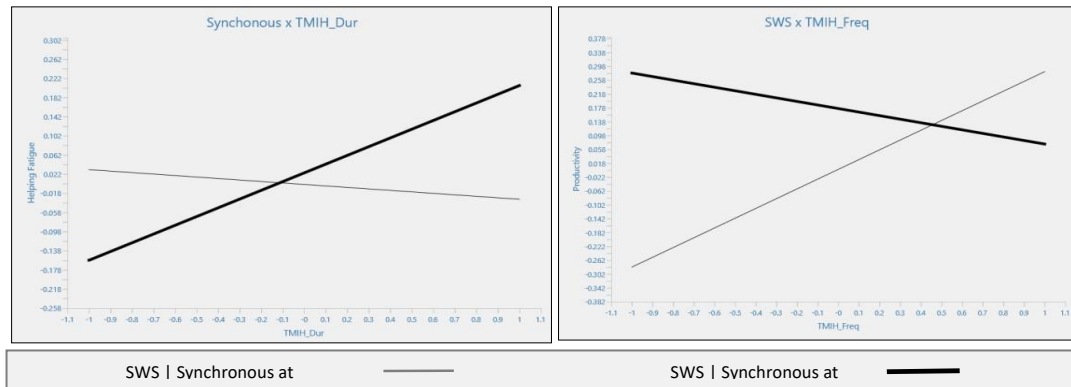

Figure 2. Results of the Interaction Effect

Note: Synchronous indicates media such as videoconferencing and audio calls. SWS means synchronous with screen sharing indicating a richer form of media.

Paths	Coefficients	Mean	Std. Dev	T statistics	P values
TMIH duration -> Helping Fatigue	-0.031	-0.03	0.048	0.647	0.518
TMIH duration -> Productivity	0.105	0.111	0.071	1.475	0.140
TMIH duration -> Interruption Overload	0.215**	0.221	0.082	2.636	**0.008**
TMIH duration -> Psychological Transition	-0.001	0.004	0.077	0.015	0.988
TMIH duration -> Task Closure	0.140	0.145	0.075	1.859	0.063
TMIH frequency -> Helping Fatigue	0.078	0.079	0.054	1.432	0.152
TMIH frequency -> Productivity	0.282***	0.285	0.073	3.865	**0.000**
TMIH frequency -> Interruption Overload	0.143*	0.145	0.067	2.134	**0.033**
TMIH frequency -> Psychological Transition	0.009	0.008	0.075	0.116	0.908
TMIH frequency -> Task Closure	0.025	0.026	0.073	0.337	0.736
Interruption Overload -> Helping Fatigue	0.453***	0.449	0.06	7.516	**0.000**
Interruption Overload -> Productivity	-0.184*	-0.184	0.086	2.132	**0.033**
Psychological Transition -> Helping Fatigue	0.070	0.069	0.049	1.439	0.150
Psychological Transition -> Productivity	0.173*	0.177	0.083	2.084	**0.037**
Task Closure -> Helping Fatigue	0.258***	0.261	0.062	4.191	**0.000**
Task Closure -> Productivity	-0.187*	-0.195	0.093	2.000	**0.046**
SWS x TMIH duration -> Helping Fatigue	0.042	0.043	0.132	0.321	0.748
SWS x TMIH duration -> Productivity	0.030	0.04	0.225	0.134	0.893
SWS x TMIH frequency -> Helping Fatigue	0.064	0.058	0.145	0.438	0.662
SWS x TMIH frequency -> Productivity	-0.385*	-0.381	0.193	1.989	**0.047**
Synchronous x TMIH duration -> Helping Fatigue	0.213*	0.194	0.106	2.019	**0.044**
Synchronous x TMIH duration -> Productivity	0.010	0.001	0.157	0.062	0.950
Synchronous x TMIH frequency -> Helping Fatigue	-0.109	-0.109	0.15	0.730	0.465
Synchronous x TMIH frequency -> Productivity	0.097	0.106	0.233	0.418	0.676
Control Variables					

Age -> Helping Fatigue	-0.016	-0.014	0.039	0.411	0.681
Age -> Productivity	-0.008	0.000	0.066	0.125	0.900
Gender -> Helping Fatigue	-0.003	-0.004	0.082	0.033	0.974
Gender -> Productivity	-0.284*	-0.283	0.119	2.380	**0.017**
Negative Affect -> Helping Fatigue	0.104*	0.105	0.049	2.135	**0.033**
Time working Remote -> Helping Fatigue	0.076	0.069	0.043	1.776	0.076
Time working Remote -> Productivity	0.075	0.037	0.088	0.843	0.399
Table 1. Results of Path Analyses					

*p<0.05; **p<0.01; ***p<0.001.

| Hypothesis	Supported?
Hypothesis 1: TMIH frequency is positively related to a) interruption overload, b) psychological transition, and c) negatively related to task closure.	Partial
Hypothesis 2: TMIH duration is positively related to a) interruption overload, b) positively related to psychological transition, and c) negatively related to task closure.	Partial
Hypothesis 3: Interruption overload is a) positively related to helping fatigue and b) negatively related to individual productivity.	Yes
Hypothesis 4: Psychological transition is a) positively related to helping fatigue and b) negatively related to individual productivity.	Partial
Hypothesis 5: Task closure is a) positively related to helping fatigue and b) negatively related to individual productivity.	Yes
Hypothesis 6: TMIH is positively related to helping fatigue.	No
Hypothesis 6a: Media synchronicity positively moderates the relationship between TMIH and helping fatigue, such that the relationship is strengthened when media is synchronous.	Partial
Hypothesis 7: TMIH is negatively related to productivity.	Yes
Hypothesis 7a: Media synchronicity negatively moderates the relationship between TMIH and productivity, such that productivity will be even lower when media is synchronous.	Partial
Table. 2. Summary of Hypotheses	
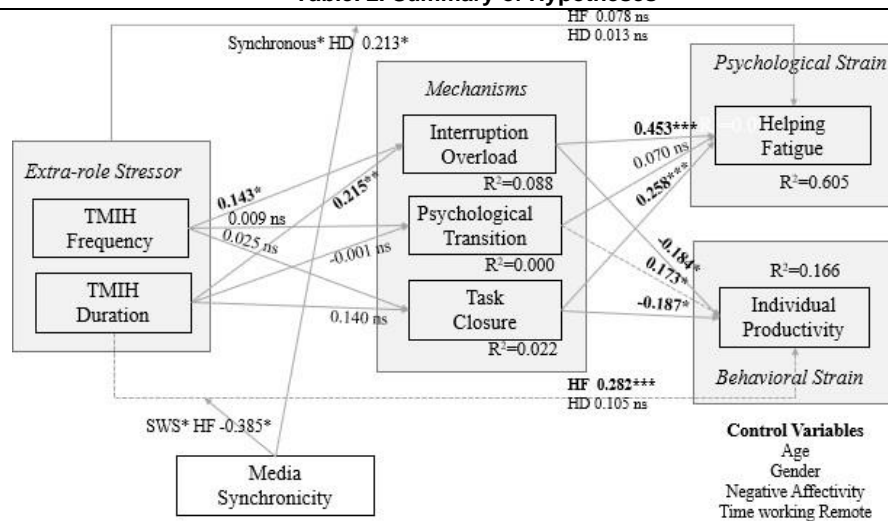
Figure 3. Results of Path Model

Note: ns - not significant; bold - significant; dotted – significant in the opposite direction; Synchronous – videoconferencing; SWS – synchronous with screen sharing. HF – Helping Frequency, HD – Helping Duration

6. Discussion

This study aimed to investigate the potential negative impact of engaging in ICT-enabled extra-role behaviors on employees' psychological and behavioral strain in the forms of fatigue and individual productivity. Additionally, we proposed that the level of synchronicity in media usage would amplify these strains. Our findings indicate that psychological and behavioral strain is influenced by the proposed mechanisms, but we are uncertain about the factors that influence these mechanisms. We found that all three mechanisms exert influence on strains, but currently, we can only explain interruption overload through

extra-role behavior. This aligns with the findings of Chen and Karahanna (2018), who found that the impact of technostress on strain was influenced by various mechanisms depending on the specific ICT used (e.g., phone calls, messaging, or e-mail). Overall, regarding the proposed mechanisms, while the study's basic premise is supported, the behavior of the proposed mechanisms remains somewhat unexplained. Therefore, to get a better understanding of these mechanisms, future research needs to explore additional factors that serve as antecedents for psychological transition and task closure.

Additionally, our research reveals that while extra-

role stressors, particularly frequency, affect productivity, they do not influence helping fatigue directly. Interestingly, contrary to studies conducted in office settings focusing on co-located employees, we did not find a relationship between extra-role behavior and fatigue. Prior research has established that going above the call of duty at work is associated with job stress (Bolino & Turnley, 2005), however, our findings indicate that when using ICT, going the extra mile does not significantly affect job stress in the form of perceived fatigue. Consistent with Smith et al. (2020), our study shows that remote work differs from co-located work when it comes to extra-role behaviors, however, further research is needed to ascertain this discrepancy. Based on recent findings by Califf et al. (2020), a plausible explanation for the difference in the outcomes of OCB-W and ICT-enabled OCB, particularly when working from home, could be variations in how employees appraise stressors when working in a physical office environment versus working remotely or from their homes. Further research is however needed to empirically validate this assertion.

Furthermore, our findings suggest that employees who engage in helping behaviors more frequently perceive themselves as more productive. This unexpected finding may suggest that the act of task switching may create a perception of overall productivity for employees, regardless of whether the productivity is directly tied to primary or extra-role tasks. This highlights the possibility that employees' individual perceptions of productivity may differ from the formal recognition of productive performance by organizations. It sheds light on the complex nature of productivity assessment within organizational contexts.

Moreover, our findings reveal that media synchronicity plays a significant role in exacerbating technostress related to ICT-enabled extra-role behaviors. We found that employees who use synchronous media such as videoconferencing experience more psychological strain in the form of fatigue than when they use low synchronous media like email. Similarly, when employees use richer synchronous media with screen sharing, this impedes individual productivity at work.

The main contribution of the study is that it identifies and empirically tests a contextual variable, media synchronicity, an exacerbator or inhibitor of technostress. Prior, research has identified various individual strain outcomes related to technostress including, platform transparency (Cram et al., 2022), technology self-efficacy (Tarafdar et al., 2015), technical support, technology involvement facilitation, innovation support (Tarafdar et al., 2011) and other forms of organizational support mechanisms (Ragu-Nathan et al., 2008). Our study contributes to this

literature by highlighting media synchronicity as an additional factor that can exacerbate or alleviate technostress depending on the frequency and duration of the extra-role task. Second, our study links the mechanisms of technostress, interruption overload, psychological transition, and task closure to extra-role stressors.

Our study offers practical implications for organizations. Firstly, considering the challenges associated with high synchronous media, it is recommended to promote the use of low synchronous media platforms for OCB-related tasks. This approach can help mitigate the negative effects of constant interruptions and time pressure that are typically associated with synchronous communication. Secondly, organizations should provide training and guidelines to help employees effectively manage their online OCBs, considering the impact of media synchronicity on technostress levels. Training programs may include strategies for time management, communication etiquette, and best practices for using both synchronous and asynchronous media. Furthermore, to address helping fatigue related to interruption overload, employees can establish clear and realistic expectations regarding response times, availability, and boundaries when engaging in OCBs online. This approach can effectively manage workload, reduce stress, and prevent burnout.

However, the study findings should be considered in light of the following limitations. First, while the focus of study was on the negative consequences of technostress, we acknowledge that technostress is not inherently a negative phenomenon as depending on individuals' cognitive appraisal, technostress can be used as motivation (Califf et al., 2020). Second, we focused solely on one form of OCB, namely helping other coworkers. Future research should explore other forms of technology- mediated OCB to gain a comprehensive understanding of their impacts on technostress. Third, although our study primarily focused on the overall impact of OCB on employee well-being, we recognize that these effects might vary depending on an employee's job position. For example, individuals in managerial roles may exhibit a greater tolerance for interruptions than those who have a subordinate role. Therefore, it would be valuable for future research to delve into these subtleties by investigating whether there are distinct effects of OCB on technostress relative to an employee's occupational position.

7. Conclusion

As we navigate the realities of the post-COVID-19 work context, scholars are investigating the behavioral and psychological outcomes of certain ICT-enabled work practices which have been increasingly

associated with the technostress phenomenon. Our work contributes to this literature by examining the effects of extra-role work practices on technostress and how media synchronicity may either inhibit or exacerbate these effects.

8. References

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