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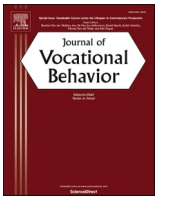

You've got mail! How work e-mail activity helps anxious workers enhance performance outcomes☆

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ABSTRACT

Despite workplace anxiety being a common experience of daily work life that is increasingly reliant on technology, we lack knowledge of technology-based job demands that prompt its occurrence. Drawing on theorization on workplace anxiety and integrating literature on information and communication technologies, we consider telepressure and normative response pressure as internal and external between-person sources of daily workplace anxiety. We further present a model of how employees adaptively (vs. maladaptively) respond to workplace anxiety on days they experience workplace anxiety, where anxiety prompts: (a) work e-mail activity, a self-regulatory behavior facilitating performance outcomes; and (b) non-work e-mail activity, a behavior that disengages employees from their work, debilitating performance outcomes. Utilizing a multilevel, time-lagged experience sampling field study across 10 workdays (Level 1 $N = 809$; Level 2 $N = 96$), we identify telepressure as a significant contributor of daily workplace anxiety. Further, we found support for an adaptive function of workplace anxiety. On days employees experienced workplace anxiety, their personal initiative and citizenship behaviors were enhanced through behavioral regulatory activity manifested in work e-mail activity. This indirect effect was strengthened for employees perceiving higher (vs. lower) work e-mail centrality. This research advances understanding of the adaptive function of workplace anxiety, such that employees are active drivers of their daily experiences of workplace anxiety.

1. Introduction

Workplace anxiety is a common experience reflecting feelings of worry about performance on work-related tasks (Cheng & McCarthy, 2018). The *New York Times* declared America the "United States of Xanax," stating: "If you're a human being living in 2017 and you're not anxious, there's something wrong with you" (Williams, 2017). The pandemic has exacerbated this experience as workers are facing a global crisis on an unprecedented scale, with workplace anxiety being labelled "the second pandemic" (Rogers Behavioral Health, 2021). Moreover, work-related anxiety carries annual estimated costs of US$1 trillion in lost productivity to the global economy (World Health Organization, 2022). Given the prevalence and associated costs of workplace anxiety for employees and organizations, research on workplace anxiety is more critical than ever before.

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With increasingly fluid modes of work post-pandemic that rely on technology (Lund et al., 2021), our understanding of how technology-based job demands affect the daily experience of workplace anxiety remains a black box. Further, it has long been thought that workplace anxiety exerts detrimental effects on performance (e.g., Ford et al., 2011; McCarthy et al., 2016). For example, existing work has predominantly focused on negative effects, variously demonstrating that workplace anxiety leads to lower job performance (McCarthy et al., 2016), lower negotiated outcomes (Brooks & Schweitzer, 2011), higher counterproductive behaviors (Rosen et al., 2020), unethical behaviors (Hillebrandt & Barclay, 2022; Kouchaki & Desai, 2015), and turnover intentions (Haider et al., 2020). This has resulted in a taken-for-granted assumption that workplace anxiety is deleterious for employees who experience it. Yet, two factors lead us to challenge this notion. First, conceptualization of anxiety as a "complex emotion" (Izard, 2013; Izard & Youngstrom, 1996) captures the potential for anxiety to exert both positive and negative effects. Indeed, fragmented research findings across disciplines have been suggestive of the benefits of anxiety. For example, evolutionary psychology depicts the instrumental and motivational function of anxiety through "fight or flight" which provides species with survival advantage (Marks & Nesse, 1994). In modern times, this experience of anxiety translates into a protective "internal alarm system" that has evolved to tell us "what isn't working" (Caron, 2022). Moreover, education and sports psychology has variously linked anxiety to enhanced performance outcomes (Kleine, 1990; Seipp, 1991). Management research has also started identifying positive effects, demonstrating that anxiety can initiate problem prevention behaviors (Barclay & Kiefer, 2019), prosocial behavior (Hu et al., 2020), and job search behaviors (Chawla & Gabriel, 2022). While informative, these represent relatively disjointed research findings across research streams that further underestimates the complexity of workplace anxiety. Our work advances current understanding by presenting a complementary approach of how employees can adaptively (vs. maladaptively) manage their work on days they experience workplace anxiety, so as to enhance their daily performance outcomes.

Second, research establishing detrimental effects of workplace anxiety, cited above, has primarily adopted a between-person perspective capturing chronic trait or state-based experiences of workplace anxiety, and drawing conclusions based on differences across individuals. Considering that workplace anxiety is a daily experience, we contend that current approaches are incomplete. To rectify this, we advance a more balanced approach by investigating, through a within-person perspective, how individuals might experience workplace anxiety within the daily work context, and further, may effectively function during the workday. In doing so, we subscribe to a more comprehensive standpoint that allows for the potential for a positive outlook on workplace anxiety.

A key assumption of employees is the commitment to attend to work during workdays. As such, starting the workday experiencing workplace anxiety requires investigating strategies that can enhance performance. We thus seek to progressively answer the following questions to advance theory and research on workplace anxiety: (1) What technology-based job demands produce the experience of daily workplace anxiety? (2) On days when employees start the workday feeling anxious about work, how do they adaptively, in contrast to maladaptively, respond to support their work performance? (3) Under what condition is the adaptive regulatory process more likely, and the maladaptive process less likely, to occur?

The first stage of our research model is situated at the between-persons level. The limited research on work-related anxiety has predominantly focused on broad categories of job demands and workplace stressors as sources of anxiety (e.g., Cheng & McCarthy, 2018), leaving unaddressed technology-based internal and external sources of daily workplace anxiety that are reflective of new modes of work. We pull from literature on information and communication technologies (ICTs) depicting internet use as an integral component of work life (Brown et al., 2014; Mano & Mesch, 2010; Ragu-Nathan et al., 2008; Russell & Woods, 2020) to consider two technology-based job demands reflective of chronic or enduring internal (telepressure) and external (normative response pressure) factors that may prompt the daily experience of workplace anxiety.

While telepressure and normative response pressure may represent sources of workplace anxiety, this does not address how employees will respond once they experience workplace anxiety day-to-day. Accordingly, the second stage of our theorizing addresses, at the within-person level, the potential for daily workplace anxiety to promote adaptive behaviors that connect employees with their daily work, while accounting for maladaptive behaviors that disengage. We take inspiration from workplace anxiety theory (Cheng & McCarthy, 2018) to uncover key mechanisms underlying this process. This framework depicts short-term self-regulatory behavior as an adaptive response, and cognitive interference as a maladaptive response, to workplace anxiety. Integrating with ICT research depicting e-mail activity as a daily work constituent (Brown et al., 2014; Mano & Mesch, 2010; Ragu-Nathan et al., 2008; Russell & Woods, 2020), our theoretical model puts forth an adaptive regulatory path, reflective of work e-mail activity as a self-regulatory behavior that engages employees to their work, enhancing performance outcomes. In conjunction with the proposed adaptive path, we model an alternative maladaptive path of workplace anxiety, reflective of non-work e-mail activity as a behavior that disengages employees from their work, impairing performance outcomes. In effect, we test important competing pathways while extending the workplace anxiety model (Cheng & McCarthy, 2018) by focusing on three performance outcomes—task performance, personal initiative, and citizenship behaviors.

We further consider *when* workplace anxiety prompts an adaptive regulatory process and minimizes a maladaptive interference process that withdraws employees from their daily work. Leveraging the workplace anxiety model framing motivation as a moderator between workplace anxiety and self-regulatory behaviors, and between workplace anxiety and cognitive interference (Cheng & McCarthy, 2018), we identify work e-mail centrality as a theoretically relevant motivational conditional variable that bolsters the adaptive process, while weakening the maladaptive process, of workplace anxiety. Work e-mail centrality—the extent to which e-mail is considered critical to completing one's work tasks (Rosen et al., 2019), is a goal-directed motivational characteristic (Rosen et al., 2019) influencing when daily workplace anxiety enhances regulatory work e-mail activity and diminishes non-work e-mail activity. We add precision to the model of workplace anxiety by portraying context-based motivation (Kanfer et al., 2017) surrounding the process through which employees can make progress and enhance their performance outcomes on days they feel anxious about work. Fig. 1 depicts our theoretical model.

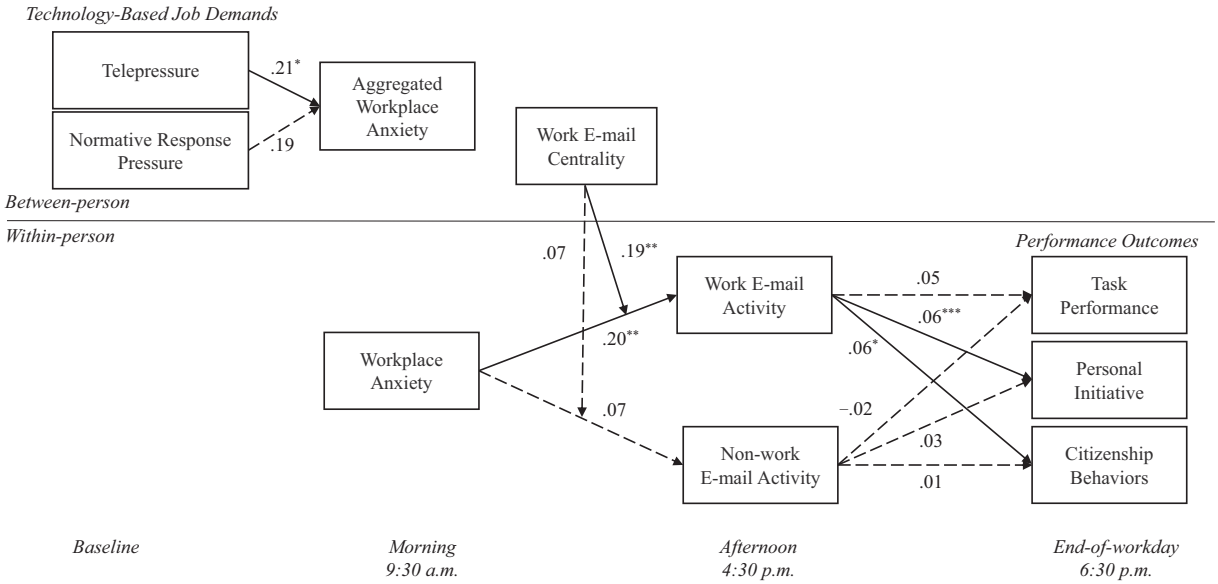

Fig. 1. Multilevel path analysis results of the hypothesized model.
Note. Level 1 $N = 809$; Level 2 $N = 96$. The estimates are unstandardized coefficients. For parsimony, control variables, including number of received e-mails, previous-day mediators and outcomes, day of the week, sine, and cosine, are not depicted in this figure. Solid arrows represent significant relationships, whereas dotted arrows represent insignificant relationships.
$^{*}p < .05$. $^{**}p < .01$. $^{***}p < .001$.

2. Theoretical development

2.1. Antecedents of daily workplace anxiety

Workplace anxiety is defined as "feelings of nervousness and apprehension about the accomplishment of job tasks" (McCarthy et al., 2016, p. 280). It is a discrete negative affective experience characterized by elevated arousal, hypervigilance, a sense of uncertainty, and low control (e.g., Cheng & McCarthy, 2018; Frijda et al., 1989; Smith & Ellsworth, 1985). Research has broadly uncovered three categories of antecedents of anxiety at work, inclusive of *organizational factors* (e.g., organizational politics, high-performance work systems; Haider et al., 2020; Xi et al., 2022); *interpersonal factors* (e.g., abusive supervision, peer abusive supervision, leader aggressive humor; Chen et al., 2022; Huang et al., 2019; Lin et al., 2022); and *intrapersonal factors* (e.g., appraisal of coping potential, Covid-19 rumination, overqualification; Hillebrandt et al., 2022; McCarthy et al., 2021; Zhang et al., 2022). To advance this research, we draw from conceptual work delineating workplace anxiety as a response to stressors (Cheng & McCarthy, 2018; McEwen et al., 2012), of which job demands are a salient predictor of episodic workplace anxiety (Cheng & McCarthy, 2018). Accordingly, we situate two technology-based job demands drawn from ICT research (e.g., Barber & Santuzzi, 2015; Brown et al., 2014), telepressure and normative response pressure, reflective of internal and external job demands that produce daily workplace anxiety. This is further conceptually aligned with the work context, including our focus on e-mail activity as potential adaptive and maladaptive responses to workplace anxiety.

Telepressure. Telepressure represents an internal job demand that may promote daily workplace anxiety. As technology has become an important tool for how information and knowledge is exchanged and for the execution of work processes (Maruping & Agarwal, 2004), such that employees now tend to use asynchronous technology, such as e-mail, as their main source of work-related communication (Finn, 2006; Markus, 1994), the associated demands to keep up, respond quickly, and be constantly accessible, even beyond official work hours, has contributed to rising pressure for employees. As such, telepressure represents a conceptually and practically relevant source of workplace anxiety. Telepressure is defined as an individual-level, trait-based "preoccupation and urge to immediately respond to work-related messages" (Barber & Santuzzi, 2015, p. 172). While the advantages of technology-facilitated communication such as e-mail and messaging are accessibility, flexibility, and convenience, by the same token, these characteristics have created undue demands on employees in terms of expectations for instantaneous responses (Barber & Santuzzi, 2015). As such, we expect that employees' degree of telepressure contributes to daily experiences of workplace anxiety.

Hypothesis 1a. At the between-person level, telepressure is positively related to daily workplace anxiety.

Normative response pressure. We also consider a situational antecedent of workplace anxiety, stemming from an external job demand arising from employees' work environment. Work-related norms to respond quickly is an important factor that bears consequences on our theoretical model of whether employees experiencing daily workplace anxiety might respond by engaging or disengaging from work. Normative response pressure refers to the presumption that the organization or one's colleagues expect quick

responses (Brown et al., 2014). As norms are socially prescribed "soft rules" that people in the workplace implicitly follow due to their desire to fit in or conform to behaviors deemed acceptable by one's peers (Bourdeau et al., 2019), normative response pressure is based on individual perception. Normative response pressure has been found to contribute to strain and emotional exhaustion (Brown et al., 2014; Mathews et al., 2003). Similarly, to the extent to which employees perceive an expectation for immediate responsiveness, irrespective of whether such a policy exists in the organization surrounding technology use and associated expectations with respect to response times, both within and outside of work hours, workplace anxiety is expected to be increased.

Hypothesis 1b. At the between-person level, normative response pressure is positively related to daily workplace anxiety.

2.2. Daily workplace anxiety prompts work e-mail activity

Although characteristics of workplace anxiety would seem to lend itself to negative outcomes, particularly due to the tendency of anxious individuals to enact avoidance or disengagement strategies (Andel et al., 2021; Cheng & McCarthy, 2018; McCarthy et al., 2016), its grounding in evolutionary psychology suggests otherwise as, unlike other negative affective experiences, anxiety represents a complex emotion carrying a survival function that prompts individuals to engage with their environment and actively cope with threats (Marks & Nesse, 1994). As such, anxiety can trigger actions that orient individuals towards the challenge at hand, such as increasing effort and planful behaviors (e.g., Barclay & Kiefer, 2019; Carver & Scheier, 1988; Gabriel, MacGowan, et al., 2021).

On days when employees start the workday experiencing anxiety about work, short of calling in sick, they need to find strategies to effectively cope with their upcoming work tasks. Workplace anxiety theory holds that this experience alerts individuals to the potential for impaired performance, which prompts course-correcting regulatory action that helps individuals improve performance (Cheng & McCarthy, 2018). In other words, adaptive effects of workplace anxiety on performance are driven by a self-regulatory process, in which self-regulatory behaviors are theorized as key drivers linking workplace anxiety with enhanced performance (Cheng & McCarthy, 2018).

In the workplace, checking, writing, and responding to work e-mail facilitates performance outcomes, since work e-mail carries information on required tasks, feedback on work processes, and other crucial work-related data (Mano & Mesch, 2010; Russell & Woods, 2020). Given that behavioral self-regulation refers to a process in which individuals adjust and adapt their behavior towards goal-directed activities (Cheng & McCarthy, 2018), and work e-mail activity represents a substantial regulatory behavior by which to improve performance outcomes (Mano & Mesch, 2010; Russell & Woods, 2020), we propose that on days in which employees start off experiencing workplace anxiety, they are likely to increase regulatory behavior, operationalized in the current study as work e-mail activity.

Work e-mail activity, inclusive of checking, writing, and responding to work e-mail, is considered an effortful self-regulatory behavior because it requires employees to switch between tasks (Jackson et al., 2001, 2003; Kushlev & Dunn, 2015). During work e-mail activity, selective attention and focus are required to sort through relevant information, as the content of work e-mail requires making connections across multiple e-mail threads that reference prior conversations (Dabbish et al., 2005). Additionally, as approximately one third of all work e-mails contain requests for further actions (Dabbish et al., 2005), checking, writing, and responding to work e-mail further requires coordinated efforts in managing, multitasking, and communicating (Barley et al., 2011; Bellotti et al., 2003; Whittaker & Sidner, 1996), and self-presentation efforts in making a desired impression on others (Vohs et al., 2005).

In line with our proposition, prior research on state anxiety has been associated with general self-regulatory behaviors in promotional examination contexts among police officers (McCarthy et al., 2009), suggesting that the experience of state-based anxiety can boost self-regulatory behaviors directing employees towards enhanced performance outcomes. Moreover, anxiety has been linked to problem-prevention behavior, based on the premise that anxiety elicits self-initiated behaviors that address work problems and restore perceptions of control (Barclay & Kiefer, 2019). Although research has not examined work e-mail activity as a concrete action that enables employees to engage with their work to function adaptively when they are anxious about work, research suggests that work e-mail activity is a goal-related action that individuals use to manage anxiety and gain control over work (Russell & Woods, 2020). Combined, we predict:

Hypothesis 2a. At the within-person level, daily workplace anxiety is positively related to daily work e-mail activity.

2.3. Daily workplace anxiety prompts non-work e-mail activity

Although the main objective of the current research is to demonstrate the adaptive function of daily workplace anxiety for employees through a path of behavioral self-regulation, in order to provide a complete test of our model, we sought to examine whether the adaptive response of daily workplace anxiety occurs alongside a common behavioral strategy in response to workplace anxiety that interferes with their work tasks (Cheng & McCarthy, 2018). Specifically, while we expect that daily workplace anxiety prompts regulatory behaviors in checking, writing, and responding to work e-mail, increasing daily performance outcomes, an alternative possibility is that employees actively *withdraw* from their work through goal-avoidant efforts via increased *non-work* e-mail activities. This is consistent with theorization on workplace anxiety depicting a dual-process model capturing both adaptive and maladaptive processes (Cheng & McCarthy, 2018), as well as empirical work portraying avoidance or disengagement responses to anxiety (e.g., Barlow, 2004; Borkovec et al., 2004; McCarthy et al., 2016). Consequently, an alternate path for employees who experience workplace anxiety on a daily basis is increased non-work e-mail activity.

In contrast to work e-mail activity, non-work e-mail activity interferes with employees' work tasks as it cognitively distracts and

pulls employees' attention away from primary work pursuits (Mano & Mesch, 2010). The workplace anxiety model proposes that when employees feel anxious, they tend to spend a disproportionate amount of cognitive processing on task-irrelevant activities, interfering with task accomplishment (Cheng & McCarthy, 2018). As such, we expect that on days in which employees start the day feeling workplace anxiety, they are likely to withdraw from their work via checking, writing, and responding to non-work e-mail.

Hypothesis 2b. At the within-person level, daily workplace anxiety is positively related to daily non-work e-mail activity.

2.4. The moderating role of work e-mail centrality

Thus far, we have outlined a model in which, based on theoretical perspectives of workplace anxiety, on one hand, experiencing workplace anxiety alerts employees to the need for allocating regulatory behaviors, depicted in our model as work e-mail activity, to their work tasks (Cheng & McCarthy, 2018). On the other hand, experiencing workplace anxiety also pulls anxious employees' resources (e.g., attention) away from their work tasks, making anxious employees more prone to cognitive distraction, depicted in our model as non-work e-mail activity. A theoretically and practically relevant question follows: When will daily experiences of workplace anxiety prompt self-regulatory behaviors reflected by work e-mail activity, and curtail interference behaviors reflected by non-work e-mail activity? Although work e-mail activity is expected to be enhanced on days employees start the workday feeling anxious about work, this self-regulatory behavior is effortful (Muraven & Baumeister, 2000). As such, theory on workplace anxiety posits that self-regulatory behaviors require motivation to counteract the pull towards interference tendencies (Cheng & McCarthy, 2018), implicating motivation as a critical moderator that guides anxious employees to redirect away from distraction behaviors (i.e., non-work e-mail activity) towards self-regulatory behaviors (i.e., work e-mail activity).

Aligned with this perspective, and given that work motivation refers to a relevant goal-directed factor that affects the manner in which individuals allocate their resources to influence the direction, intensity, and persistence of activities (Kanfer et al., 2017), work e-mail centrality—the degree to which e-mail is critical to the completion of employees' work tasks (Rosen et al., 2019), represents a compelling context-based motivation (Kanfer et al., 2017) that enhances anxious employees' work e-mail regulatory activities. In addition, conceptual work on the impact of workplace anxiety on self-regulatory processes frames its dependency on motivational expectancy, namely, the perceived likelihood of achieving desired outcomes given further effort (Carver & Scheier, 1988; Cheng & McCarthy, 2018). In other words, goal-relevance of a behavior—such as the centrality of e-mail to one's work—increases the perceived utility of such behavior (cf. Wilton & Myers, 1986). Based further on Kanfer et al.'s (2017) review of a century of work motivation research, which maintains that various job characteristics provide employees with work context-based motivation and felt responsibility, work e-mail centrality, as a job characteristic, creates a motivational context that strengthens employees' absorption in work e-mail activity on days they experience workplace anxiety.

Along this line of reasoning, we expect that the more central work e-mails are to the completion of individuals' work tasks, the expectancy of enacting work e-mail activities is correspondingly favorable, motivating anxious employees to engage in this effortful self-regulatory behavior. Building on this argument, we anticipate that on days employees experience workplace anxiety, they will be more motivated to enact regulatory behavior reflected in work e-mail activity, to the extent that work e-mail represents a central aspect of their work. Work e-mail centrality, as a motivating characteristic, is expected to channel workplace anxiety towards engagement in work e-mail activity that contributes to enhanced performance outcomes. In contrast, on days when employees experience workplace anxiety, to the extent to which work e-mail activity does not represent a primary activity in their work role, motivation to enact work e-mail activity is reduced, as attention and focus directed towards a non-core activity would consume limited resources (Muraven & Baumeister, 2000). Accordingly, when work e-mail centrality is low, there is insufficient motivation for employees experiencing workplace anxiety day-to-day to invest limited regulatory resources towards work activities. Aligned with the workplace anxiety model of self-regulation (Cheng & McCarthy, 2018), we expect that daily workplace anxiety will enhance work e-mail behaviors to a greater extent, under conditions of high (vs. low) work e-mail centrality.

Theory on workplace anxiety also suggests that when employees feel anxious about work tasks and lack motivation to complete it, they are more prone to distraction by task-irrelevant issues (Cheng & McCarthy, 2018), such as non-work e-mails. Given that work e-mail centrality provides a strong impetus and motivation preventing employees from disengaging via non-work e-mail activity, we posit that, on days in which employees experience workplace anxiety, they are less likely to enact non-work e-mail activity when work e-mail centrality is high (vs. low).

Hypothesis 3a. At the within-person level, the positive relationship between daily workplace anxiety and daily work e-mail activity will be stronger to the extent to which e-mail is more (vs. less) central to employees' work.

Hypothesis 3b. At the within-person level, the positive relationship between daily workplace anxiety and daily non-work e-mail activity will be weaker to the extent to which e-mail is more (vs. less) central to employees' work.

2.5. Daily workplace anxiety, e-mail activities, and performance outcomes

We further consider how daily experiences of workplace anxiety, which drive behavioral regulation reflected in work e-mail activity, will impact daily performance outcomes. Drawing from theoretical accounts of workplace anxiety depicting an adaptive effect of workplace anxiety on performance through a self-regulatory process (Cheng & McCarthy, 2018), and research supporting e-mail activity as a goal-directed behavior facilitating employees' competent and efficient work process (Russell & Woods, 2020), we situate work e-mail activities—checking, writing, and responding to work e-mail—as a behavioral regulatory strategy that helps employees

who are anxious about work that day focus their attention and effort towards enhancing performance outcomes.

We consider task performance, personal initiative, and citizenship behaviors, to capture distinct elements of job performance (Sonnentag et al., 2008). We first expect that work e-mail activity contributes to employees' task performance, on days they experience workplace anxiety. Conceptual work demarcates a positive process between workplace anxiety, self-regulatory behavior, and performance (Cheng & McCarthy, 2018). When employees experience workplace anxiety, this initiates behavioral regulation in the form of work e-mail activity that enhances in-role task performance that day. Considering employees' dependency on information exchange in the modern workplace, work e-mail activity improves the absorption and processing of work-related information crucial for getting work tasks done, thereby contributing to higher task performance (Mano & Mesch, 2010).

Beyond task performance, we expect that the experience of workplace anxiety will prompt personal initiative, an active and self-initiating approach that employees take towards their work (Frese et al., 1996). Personal initiative is a form of proactive behavior and an indicator of contextual performance that extends beyond formal job requirements (Frese et al., 1996). As work-related anxiety is a forward-looking anticipatory experience that is associated with uncertainty over work outcomes (Cheng & McCarthy, 2018; Lazarus, 1991), engaging in work e-mail is a regulatory action that facilitates individuals' control over their work, contributing to continued proactive action they take over their work.

We also expect that, on days when employees feel anxious about work, promoting work progress as a function of work e-mail regulatory activity, employees will engage in more citizenship behaviors directed towards individuals within the organization (Organ, 1988), for example, helping colleagues who are overextended, providing support through encouragement, or expressing appreciation. This is aligned with a within-person behavioral regulatory perspective, which suggests that individuals are more likely to pursue citizenship behaviors in the absence of obstacles (Bolino et al., 2012). When individuals make progress on their work tasks, individuals have extra resources for discretionary behaviors (Rosen et al., 2019), such as personal initiative and citizenship behaviors (Chawla et al., 2020). Given the nature of work e-mail activity as being inherently interpersonal—an electronic tool for coordination with others (Dabbish & Kraut, 2006; Russell & Woods, 2020), we expect that work e-mail activity will increase citizenship behaviors.

Hypothesis 4. At the within-person level, daily work e-mail activity mediates the relationship between daily workplace anxiety and daily (a) task performance, (b) personal initiative, and (c) citizenship behaviors.

Combined, we predict an overall model in which daily workplace anxiety prompts self-regulatory behaviors reflected in work e-mail activity and in turn enhances performance outcomes. Further, work e-mail centrality influences the strength of this indirect relationship via the workplace anxiety and work e-mail activity link (i.e., first-stage moderation).

Hypothesis 5. At the within-person level, the indirect effects of daily workplace anxiety on daily (a) task performance, (b) personal initiative, and (c) citizenship behaviors through daily work e-mail activity are moderated by work e-mail centrality, such that these indirect effects will be stronger to the extent to which e-mail is more (vs. less) central to employees' work.

In contrast, non-work e-mail activity is expected to diminish task performance, personal initiative, and citizenship behaviors. Accordingly, we expect that, on days in which employees experience workplace anxiety, disengaging from work through non-work e-mail activity negatively influences performance outcomes.

Hypothesis 6. At the within-person level, daily non-work e-mail activity mediates the relationship between daily workplace anxiety and daily (a) task performance, (b) personal initiative, and (c) citizenship behaviors.

Combined, daily workplace anxiety is expected to prompt non-work e-mail activity, which debilitates task performance, personal initiative, and citizenship behaviors. Moreover, work e-mail centrality weakens the indirect effect of workplace anxiety on performance outcomes through non-work e-mail activity (i.e., first-stage moderation).

Hypothesis 7. At the within-person level, the indirect effects of daily workplace anxiety on daily (a) task performance, (b) personal initiative, and (c) citizenship behaviors through daily non-work e-mail activity are moderated by work e-mail centrality, such that these indirect effects will be weaker to the extent to which e-mail is more (vs. less) central to employees' work.

3. Method

3.1. Sample and procedure

Aligned with our interest in the within-person effects of workplace anxiety, we tested our overall model in a time-lagged experience sampling study (ESM). We recruited full-time administrative employees from a university in Hong Kong, determined to be an appropriate sample to test our theoretical model, as initial interviews conducted with employees revealed high daily job demands, pressure for efficient and accurate work, as well as unpredictability in dealing with various stakeholders with diverse and time-sensitive demands, to represent significant sources of daily work anxiety. An invitation e-mail comprising a description of the study was sent to administrative employees. A total of 130 employees registered to participate.

The study took place across three weeks and consisted of two phases. In the first phase, participants were asked to complete a one-time online baseline survey upon signing up for the study. In the baseline survey, we assessed participants' perceptions of telepressure and normative response pressure, work e-mail centrality, and demographic information. In the second phase, which occurred one week following the first phase, we captured our focal variables at three time points daily over 10 consecutive workdays (i.e., Monday to Friday across two work weeks). Specifically, we sent three daily survey links per day to the 130 participants at 9:30 a.m., 4:30 p.m., and

6:30 p.m., according to the usual start and end time of employees at the university as indicated during our initial interviews. The afternoon survey provided a sufficient time lag to allow us to accurately capture work and non-work e-mail activity on a daily basis while maintaining multiple time intervals between our predictor, mediators, and outcomes. Electronic timestamps recorded the exact time of data submission. On average, participants completed the morning survey at 10:00 a.m., afternoon survey at 5:04 p.m., and end-of-workday survey at 8:03 p.m.. In the morning survey, we measured participants' workplace anxiety. In the afternoon survey, we measured work e-mail activity, non-work e-mail activity, and number of e-mails received. In the end-of-workday survey, we measured performance outcomes. Participants received up to 200 HKD (approximately $25 USD) for their participation.

Among the 130 participants who signed up and completed the baseline survey, nine participants did not proceed with the daily surveys. The remaining 121 participants provided 968 morning survey responses, 922 afternoon survey responses, and 853 end-of-workday survey responses. We then matched the morning, afternoon, and end-of-workday survey responses to form a full day-level data point and obtained 830 full data points. Following Singer and Willett (2003), the final sample retained those who provided a full day-level data point (i.e., completed morning, afternoon, and end-of-workday surveys on the same day) for at least three days. This procedure resulted in a final sample of 96 participants and 809 full day-level data points out of a possible 960 (i.e., 96 participants × 10 days), yielding a response rate of 84.27 %. Among the final sample of 96 participants, 74 % were female and 90.63 % held a bachelor's degree or above. The average age was 34.09 years (SD = 8.79), the average organizational tenure was 6.28 years (SD = 8.00), and the average weekly work hours were 35.48 (SD = 14.30). The final sample (96 participants) did not differ from those (34 participants) excluded from data analyses in terms of age, gender, organizational tenure, weekly work hours, and education (all p values exceed .10).

3.2. Measures

Unless otherwise stated, all measures used a 5-point scale (1 = *strongly disagree* to 5 = *strongly agree*) in which participants rated their degree of agreement with each statement.

3.2.1. Level 2 measures

Telepressure. Telepressure was assessed in the baseline survey with the six-item scale from Barber and Santuzzi (2015). A sample item is: "I feel a strong need to respond to others immediately." The coefficient α was .87.

Normative response pressure. Normative response pressure was captured in the baseline survey with the four-item scale from Brown et al. (2014). A sample item is: "The organization expects employees to respond to e-mails in a timely fashion." The coefficient α was .82.

Work e-mail centrality. Work e-mail centrality was measured in the baseline survey with the four-item scale developed by Dabbish and Kraut (2006) and validated by Rosen et al. (2019). A sample item is: "E-mail is critical for getting my work done." The coefficient α was .82.

3.2.2. Level 1 measures

Workplace anxiety (morning). We used McCarthy et al.'s (2016) eight-item scale to capture workplace anxiety. Participants reported the extent of their agreement with each statement "right now". A sample item is: "I am overwhelmed by thoughts of doing poorly at work." The average α across days was .97.

Work and non-work e-mail activity (afternoon). We measured work and non-work e-mail activity separately using the single item adapted from Kushlev and Dunn (2015). Participants reported the frequency with which they engaged in "checking, writing, or responding to work e-mails" and "checking, writing, or responding to non-work e-mails" since the morning survey they completed (1 = *never* to 5 = *quite often*).

Task performance (end-of-workday). We assessed task performance using the two-item scale from Trougakos et al. (2015). This scale emphasizes self-ratings around one's average performance level, alleviating potential biases in self-enhancement. Participants rated the extent of their agreement with each statement since the last survey they completed. A sample item is: "I fulfilled my roles and responsibilities more effectively than I typically do." The average α across days was .81.

Personal initiative (end-of-workday). We assessed personal initiative with the seven-item scale from Frese et al. (1997). Participants reported the extent of their agreement with each statement since the last survey they completed. A sample item is: "I actively attacked problems." The average α across days was .86.

Citizenship behaviors (end-of-workday). We assessed citizenship behaviors with the four-item daily scale from Guarana et al. (2021). Participants rated the extent of their agreement with each statement since the last survey they completed. A sample item is: "I took time to advise, help, or mentor a co-worker." The average α across days was .86.

3.2.3. Control variables

We controlled for several within-person factors that have been demonstrated by past research to affect our focal variables, noting that removing the control variables does not change the pattern of significance. First, we controlled for the daily number of e-mails received since the morning survey (single item: "how many e-mails have you received since the morning survey?") as it has been identified to be an important factor influencing e-mail activity and work outcomes (Barley et al., 2011; Brown et al., 2014; Dabbish & Kraut, 2006; Jerejian et al., 2013). We also controlled for previous-day mediators and outcomes (i.e., previous-day work e-mail activity, non-work e-mail activity, task performance, personal initiative, and citizenship behaviors) to account for autoregressive effects (Scott & Barnes, 2011). Finally, we controlled for the day of the week, sine and cosine of the day to account for linear and cyclical

trends of our ESM data (Beal & Weiss, 2003).

3.3. Analytical approach

We established a cross-level moderated-mediation model to analyze the data using Mplus Version 8.7 (Muthén & Muthén, 1998–2021). Daily survey data were nested within each participant. We analyzed the multilevel model in an unconflated multilevel modeling framework, which enabled us to separate within- versus between-person effects in multilevel settings (Zhang et al., 2009). To remove between-person variance in estimating within-person effects, we centered all Level 1 variables around their group means and centered the Level 2 predictors and moderator around their grand means (e.g., Hofmann & Gavin, 1998; Wanberg et al., 2010; Zhang et al., 2009). Consistent with previous ESM studies (e.g., Chawla et al., 2020; Lanaj et al., 2019), we modeled hypothesized paths with random slopes and control paths with fixed slopes. To account for unmeasured common causes, we allowed disturbance terms of variables, such as work and non-work e-mail activities, at the same point to covary (e.g., Gabriel, Lanaj et al., 2021; Lee et al., 2016). Although we followed best practices to test the direct paths in analyzing mediation effects in multilevel models (Preacher et al., 2010), our results were consistent with or without adding the direct paths. To test indirect effects, we used Monte Carlo simulation with 20,000 iterations to generate bias-corrected 95 % confidence intervals (CIs; Selig & Preacher, 2008). The data and code for the analyses are available at: https://osf.io/fne7w/?view_only=920d022936cc45f5bcdce971cd57ec57.

4. Results

4.1. Preliminary analysis

We first ran a null model that contained only intercepts and no predictors, to decompose within- and between-person variance in each Level 1 variable. 32.00 % to 66.67 % of the variance in Level 1 variables was within-person (morning workplace anxiety = 32.00 %; afternoon number of received e-mails = 40.88 %; afternoon work e-mail activity = 48.94 %; afternoon non-work e-mail activity = 57.53 %; end-of-workday task performance = 66.67 %; end-of-workday personal initiative = 42.86 %; end-of-workday citizenship behaviors = 46.51 %), justifying our within-person modeling for data analysis (Podsakoff et al., 2019). Next, we ran a multilevel confirmatory factor analysis (CFA), modeling our focal study variables (i.e., workplace anxiety, work e-mail activity, non-work e-mail activity, task performance, personal initiative, and citizenship behaviors) and control variable (i.e., number of received e-mails) as distinct factors at Level 1 and modeling our predictors (i.e., telepressure, normative response pressure) and moderator (i.e., work e-mail centrality) as distinct factors at Level 2. Following prior ESM practice (e.g., Gabriel, Lanaj et al., 2021a; Lin et al., 2020), items at Level 1 were group-mean centered, and at Level 2 were grand-mean centered. Results indicated good fit, $\chi^2_{(346)} = 703.76$, CFI = .93, TLI = .92, RMSEA = .04, $SRMR_{within} = .04$, and $SRMR_{between} = .10$. Our hypothesized ten-factor measurement model fit the data better than alternative models (see Table 1).

4.2. Hypothesis testing

Table 2 presents descriptive statistics for all variables. Table 3 shows the results of the multilevel path analysis. The estimates are unstandardized coefficients, resulting from an overall analysis including predictors (i.e., telepressure, normative response pressure, workplace anxiety, work e-mail activity, non-work e-mail activity), moderator (i.e., work e-mail centrality), outcome variables (i.e., task performance, personal initiative, citizenship behaviors), and control variables (i.e., number of received e-mails, previous-day mediators and outcomes, day of the week, sine and cosine of the day) in a single model. The results are also summarized in Fig. 1.

Hypothesis 1a proposed that telepressure is positively related to daily workplace anxiety at the between-person level. Results indicated that the effect of telepressure on daily workplace anxiety at the between-person level was significant ($\gamma = .21$, $p = .017$), providing evidence for Hypothesis 1a. Hypothesis 1b posited that normative response pressure is positively related to daily workplace anxiety at the between-person level. Results showed that the effect of normative response pressure on daily workplace anxiety at the between-person level was not significant ($\gamma = .19$, $p = .060$), failing to support Hypothesis 1b.

Hypothesis 2a proposed that, on a daily basis, morning workplace anxiety is positively related to afternoon work e-mail activity. Supporting this hypothesis, the effect of morning workplace anxiety on afternoon work e-mail activity was significant ($\gamma = .20$, $p = .004$). Hypothesis 2b proposed that, on a daily basis, morning workplace anxiety is positively related to afternoon non-work e-mail activity. Morning workplace anxiety was not related to afternoon non-work e-mail activity ($\gamma = .07$, $p = .396$). Hypothesis 2b was not supported.

Hypothesis 3a predicted that work e-mail centrality moderates the relationship between morning workplace anxiety and afternoon work e-mail activity, such that the relationship is stronger to the extent to which e-mail is more (vs. less) central to employees' work. Results showed that the cross-level moderation effect of work e-mail centrality was significant ($\rho = .19$, $p = .009$). As expected, the effect of morning workplace anxiety on afternoon work e-mail activity was significant when work e-mail centrality was high ($\rho = .33$, $p = .000$), but not when work e-mail centrality was low ($\rho = .06$, $p = .482$). The difference in strength between these two effects was significant ($\Delta\rho = .27$, $p = .010$), supporting Hypothesis 3a. Fig. 2 displays the interaction effect of work e-mail centrality on the relationship between morning workplace anxiety and afternoon work e-mail activity.

Hypothesis 3b proposed that work e-mail centrality moderates the relationship between morning workplace anxiety and afternoon non-work e-mail activity, such that the relationship is weaker to the extent to which e-mail is more (vs. less) central to employees' work. Results indicated that the cross-level moderation effect of work e-mail centrality was not significant ($\rho = .07$, $p = .442$). The

Table 1
Results of confirmatory factor analysis.

Model	χ^2	df	CFI	TLI	RMSEA	SRMR within	SRMR between	Δdf	$\Delta\chi^2$
Ten-factor model: workplace anxiety, work e-mail activity, non-work e-mail activity, number of received e-mails, task performance, personal initiative, citizenship behavior, workplace telepressure, normative response pressure, work e-mail centrality	703.76***	346	.93	.92	.04	.04	.10		
Nine-factor model: workplace anxiety, work e-mail activity, non-work e-mail activity, number of received e-mails, task performance, personal initiative, citizenship behavior, workplace telepressure and normative response pressure, work e-mail centrality	801.76***	348	.91	.90	.04	.04	.16	2	98.00***
Nine-factor model: workplace anxiety and work e-mail activity, non-work e-mail activity, number of received e-mails, task performance, personal initiative, citizenship behavior, workplace telepressure, normative response pressure, work e-mail centrality	769.67***	351	.91	.91	.04	.04	.10	5	65.91***
Nine-factor model: workplace anxiety and non-work e-mail activity, work e-mail activity, number of received e-mails, task performance, personal initiative, citizenship behavior, workplace telepressure, normative response pressure, work e-mail centrality	756.32***	351	.92	.91	.04	.04	.10	5	52.56***
Nine-factor model: workplace anxiety, work e-mail activity, non-work e-mail activity, number of received e-mails, task performance and personal initiative, citizenship behavior, workplace telepressure, normative response pressure, work e-mail centrality	990.57***	352	.87	.86	.05	.05	.10	6	286.81***
Nine-factor model: workplace anxiety, work e-mail activity, non-work e-mail activity, number of received e-mails, task performance, personal initiative and citizenship behavior, workplace telepressure, normative response pressure, work e-mail centrality	1083.17***	352	.85	.84	.05	.05	.10	6	379.41***
Nine-factor model: workplace anxiety, work e-mail activity, non-work e-mail activity, number of received e-mails, task performance and citizenship behavior, personal initiative, workplace telepressure, normative response pressure, work e-mail centrality	1018.35***	352	.86	.86	.05	.05	.10	6	216.59***

Note. CFI = comparative fit index; TLI = Tucker-Lewis index; RSMEA = root mean square error of approximation; SRMR = standardized root mean square residual.
*** $p < .001$.

Table 2
Means, standard deviations, correlations among study variables, and reliabilities.

Variable	M	SD	1	2	3	4	5	6	7	8	9	10
Between-person level												
1. Telepressure	2.68	.81	(.87)	.06	.09	.01	.23*	.02	.02	.22*	.17	.34**
2. Normative response pressure	3.37	.71		(.82)	.25*	.11	.19	.11	−.08	−.15	−.18	−.13
3. Work e-mail centrality	3.88	.71			(.82)	.09	.10	.46***	.12	−.16	−.05	.10
Within-person level												
4. Afternoon number of received e-mails	17.13	16.34				–	.07	.36***	−.01	−.11	−.07	.04
5. Morning workplace anxiety	2.73	.88				.08*	(.97)	.15	.08	.07	.03	.35**
6. Afternoon work e-mail activity	3.55	1.18				.10*	.14**	–	.38***	.01	.22*	.28**
7. Afternoon non-work e-mail activity	2.31	1.20				.09	.04	.27***	–	.04	.23*	.26*
8. End-of-workday task performance	3.29	.66				.00	.00	.08	−.01	(.81)	.69***	.52***
9. End-of-workday personal initiative	3.34	.53				.05	.01	.19***	.13*	.28***	(.86)	.64***
10. End-of-workday citizenship behaviors	3.35	.65				.00	.00	.12*	.03	.18**	.45***	(.86)

Note. Level 1 $N = 809$; Level 2 $N = 96$. Coefficients below the diagonal indicate within-person correlations, and coefficients above the diagonal indicate between-person correlations. Internal consistency reliabilities are presented in parentheses along the diagonal in bold.
* $p < .05$.
** $p < .01$.
*** $p < .001$.

Table 3
Path analytic results from the estimated multilevel model.

Predictor	Morning workplace anxiety	Afternoon work e-mail activity	Afternoon non-work e-mail activity	End-of-workday task performance	End-of-workday personal initiative	End-of-workday citizenship behaviors
	γ	γ	γ	γ	γ	γ
Between level						
Intercept	2.74(.07)***	3.57(.08)***	2.34(.09)***	3.27(.04)***	3.33(.04)***	3.33(.05)***
Telepressure	.21(.09)*					
Normative response pressure	.19(.10)					
E-mail centrality to work		.57(.10)***	.14(.13)			
Within level						
Day of the week		−.07(.04)	.00(.05)	.01(.03)	.02(.02)	−.02(.02)
Sine		.06(.06)	−.05(.07)	−.02(.05)	.02(.03)	.03(.03)
Cosine		.03(.05)	−.06(.07)	−.06(.03)	−.01(.02)	.03(.03)
Previous-day work e-mail activity		.04(.05)				
Previous-day non-work e-mail activity			.11(.07)			
Previous-day task performance				−.05(.06)		
Previous-day personal initiative					.00(.06)	
Previous-day citizenship behaviors						.03(.05)
Afternoon number of received e-mails		.01(.00)	.01(.01)	.00(.00)	.00(.00)	.00(.00)
Morning workplace anxiety		.20(.07)**	.07(.08)	−.01(.04)	−.01(.03)	−.01(.03)
Afternoon work e-mail activity				.05(.03)	.06(.02)***	.06(.03)*
Afternoon non-work e-mail activity				−.02(.03)	.03(.02)	.01(.03)
Residual variance		.56(.05)***	.70(.08)***	.29(.03)***	.12(.01)***	.19(.02)***
Pseudo-R^2 at Level 1		.19	.17	.02	.03	.04
Cross-level interaction						
Morning workplace anxiety × e-mail centrality to work		.19(.07)**	.07(.09)			

Note. Level 1 $N = 809$; Level 2 $N = 96$. The estimates are unstandardized coefficients. Values in parentheses are standard errors. The pseudo-R^2 at Level 1 was calculated by subtracting the residual variance in the complex model from the residual variance in the empty model, divided by the residual variance in the empty model (Raudenbush & Bryk, 2002).

* $p < .05$.
** $p < .01$.
*** $p < .001$.

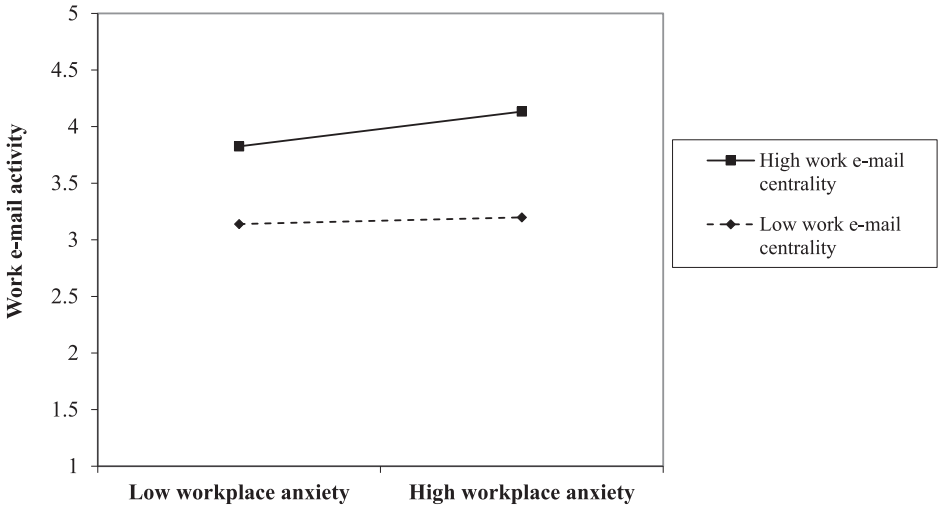

Fig. 2. Cross-level moderating effect of work e-mail centrality on the relationship between workplace anxiety and work e-mail activity.

effect of morning workplace anxiety on afternoon non-work e-mail activity was not significant when work e-mail centrality was high (ρ = .12, p = .280) and low (ρ = .02, p = .827). The difference in strength between these two effects was not significant (Δρ = .10, p = .445). Hypothesis 3b was not supported.

Hypothesis 4 proposed that, on a daily basis, afternoon work e-mail activity mediates the relationship between morning workplace anxiety and end-of-workday (a) task performance, (b) personal initiative, and (c) citizenship behaviors. Results showed that the direct effect of afternoon work e-mail activity on end-of-workday task performance (γ = .05, p = .052) was not significant, but the direct effects of work e-mail activity on end-of-workday personal initiative (γ = .06, p = .000) and on end-of-workday citizenship behaviors (γ = .06, p = .028) were significant. The indirect effect of morning workplace anxiety via afternoon work e-mail activity on end-of-workday task performance (ρ = .010, 95 % CI = [−0.0003, 0.0244]) was not significant. As such, Hypothesis 4a was not supported. The indirect effects of morning workplace anxiety via afternoon work e-mail activity on end-of-workday personal initiative (ρ = .012, 95 % CI = [0.0030, 0.0223]) and on end-of-workday citizenship behaviors (ρ = .011, 95 % CI = [0.0007, 0.0249]) were significant, supporting Hypotheses 4b and 4c.

Hypothesis 5 proposed that work e-mail centrality moderates the indirect effects of morning workplace anxiety on end-of-workday (a) task performance, (b) personal initiative, and (c) citizenship behaviors, via afternoon work e-mail activity. Results showed that morning workplace anxiety had stronger indirect effects on end-of-workday (a) task performance (ρ = .016, 95 % CI = [−0.0004, 0.0361]), (b) personal initiative (ρ = .019, 95 % CI = [0.0071, 0.0349]), and (c) citizenship behaviors (ρ = .018, 95 % CI = [0.0019, 0.0400]) at high levels of work e-mail centrality than on end-of-workday (a) task performance (ρ = .003, 95 % CI = [−0.0052, 0.0168]), (b) personal initiative (ρ = .004, 95 % CI = [−0.0072, 0.0153]), and (c) citizenship behaviors (ρ = .004, 95 % CI = [−0.0077, 0.0153]) at low levels of work e-mail centrality. For task performance, the difference in strength between the high moderated-mediation and low moderated-mediation effects was not significant (Δρ = .013, 95 % CI = [−0.0005, 0.0308]). For personal initiative, the difference in strength between the high moderated-mediation and low moderated-mediation effects was significant (Δρ = .016, 95 % CI = [0.0029, 0.0333]). For citizenship behaviors, the difference in strength between the high moderated-mediation and low moderated-mediation effects was significant (Δρ = .015, 95 % CI = [0.0005, 0.0379]). In sum, Hypothesis 5a was not supported, while Hypotheses 5b and 5c were supported.

Hypothesis 6 proposed that, on a daily basis, afternoon non-work e-mail activity mediates the relationship between morning workplace anxiety and end-of-workday (a) task performance, (b) personal initiative, and (c) citizenship behaviors. Results showed that the direct effects of afternoon non-work e-mail activity on end-of-workday task performance (γ = −0.02, p = .559), on end-of-workday personal initiative (γ = .03, p = .102), and on end-of-workday citizenship behaviors (γ = .01, p = .873) were not significant. The indirect effects of morning workplace anxiety via afternoon non-work e-mail activity on end-of-workday task performance (ρ = −0.001, 95 % CI = [−0.0082, 0.0053]), on end-of-workday personal initiative (ρ = .002, 95 % CI = [−0.0025, 0.0095]), and on end-of-workday citizenship behaviors (ρ = .000, 95 % CI = [−0.0069, 0.0069]) were insignificant. Hypotheses 6a, 6b, and 6c were not supported.

Hypothesis 7 proposed that work e-mail centrality moderates the indirect effects of workplace anxiety on (a) task performance, (b) personal initiative, and (c) citizenship behaviors via non-work e-mail activity. Results indicated that morning workplace anxiety did not show stronger indirect effects on (a) task performance (ρ = −0.002, 95 % CI = [−0.0117, 0.0081]), (b) personal initiative (ρ = .003, 95 % CI = [−0.0027, 0.0141]), and (c) citizenship behaviors (ρ = .001, 95 % CI = [−0.0094, 0.0109]) at high levels of non-work e-mail centrality than on (a) task performance (ρ = .000, 95 % CI = [−0.0075, 0.0063]), (b) personal initiative (ρ = .001, 95 % CI = [−0.0054, 0.0083]), and (c) citizenship behaviors (ρ = .000, 95 % CI = [−0.0067, 0.0061]) at low levels of non-work e-mail centrality. For task performance, the difference in strength between the high moderated-mediation and low moderated-mediation effects was not significant (Δρ = −0.002, 95 % CI = [−0.0119, 0.0084]). For personal initiative, the difference in strength between the high

moderated-mediation and low moderated-mediation effects was not significant (Δρ = .003, 95 % CI = [−0.0048, 0.0134]). For citizenship behaviors, the difference in strength between the high moderated-mediation and low moderated-mediation effects was not significant (Δρ = .000, 95 % CI = [−0.0091, 0.0111]). Hypotheses 7a, 7b, and 7c were not supported.

5. Discussion

Despite being a ubiquitous daily experience, the impact of workplace anxiety is poorly understood, particularly in terms of technology-related sources of daily workplace anxiety, and in relation to how employees can actively manage their work when they start the day experiencing workplace anxiety. Building on and extending workplace anxiety theory (Cheng & McCarthy, 2018) as well as literature on ICTs, we found that an internal job demand reflected in telepressure is a significant contributor of daily experiences of workplace anxiety. We also found support for a dynamic regulatory model of how daily workplace anxiety enhances personal initiative and citizenship behavior via work e-mail activity as a regulatory behavior. We also demonstrate that this process is strengthened under conditions in which e-mail is perceived to be central to employees' work.

5.1. Theoretical contributions

Our findings make a number of important theoretical contributions to workplace anxiety and ICT research. First, we bridge two cross-disciplinary literatures that have relevance to management literature yet have been disconnected, by identifying a two-stage model in which we identify, first, a technology-based job demand that generates daily experiences of workplace anxiety. Job demands arising from internal perceptions of telepressure to immediately respond to work-related messages are a significant source of workplace anxiety, particularly relevant in the context of new modes of work that rely heavily on asynchronous technology-based communication (Maruping & Agarwal, 2004). Contrary to predictions, we did not find normative response pressure to constitute a predictor of workplace anxiety. These non-significant findings may reflect research suggestive of employees not necessarily conforming to normative pressures (Barber & Santuzzi, 2015). Consideration of technology-based job demands extends theory on workplace anxiety which points to general job demands as important drivers of daily workplace anxiety (Cheng & McCarthy, 2018). This knowledge provides an updated starting point for how workplace anxiety can be appropriately managed, leveraging the benefits, rather than the pressures, that technology introduces.

Second, we unfold, in stage two of our model, how employees experiencing daily workplace anxiety may productively shape their workday so as to reap performance benefits. Our key contribution lies in extending research on workplace anxiety that broadly discusses self-regulatory strategies (Cheng & McCarthy, 2018) by pinpointing the specific regulatory process through which daily experiences of workplace anxiety enhance various performance outcomes, via work e-mail activity. When employees start the workday feeling anxious, this prompts engagement in adaptive regulatory behaviors to enhance work outcomes through work e-mail activity. Moreover, this adaptive function of workplace anxiety is present, controlling for an alternative response, non-work e-mail activity, a behavior that disengages employees from their work tasks. Of note, we found support for two performance outcomes, personal initiative and citizenship behavior, both of which are considered contextual performance, with no support for task performance, though the relationship trends positive. The non-significant relationship could potentially reflect the increasing multitasking nature of employees' work (Kapadia & Melwani, 2021; Neal et al., 2017) such that work e-mail activity may require task switching between several work-related activities that depletes resources and makes it difficult to maintain task performance (Leroy, 2009). Our findings linking workplace anxiety to contextual performance are worthy of note, as it points to the importance of capturing a broader array of performance categories to unveil how employees experiencing day-to-day workplace anxiety can effectively make progress on their work manifested in various forms of performance that may not necessarily be reflected in task performance. Our results run counter to past research depicting workplace anxiety as an experience that should be avoided (e.g., Reio & Callahan, 2004) by painting a positive outlook for employees who experience workplace anxiety, indicative of a more nuanced picture of how employees may adaptively deal with workplace anxiety day-to-day.

Our findings also contribute to ICT literature (Addas & Pinsonneault, 2018; Barley et al., 2011; Kushlev & Dunn, 2015), by highlighting workplace anxiety as a precursor of work e-mail activity. Notably, our findings point to an adaptive function of work e-mail activity—it serves as a regulatory behavior that enhances performance outcomes on days employees feel anxious. In contrast to research linking e-mail demands to elevated stress (e.g., Kushlev & Dunn, 2015; Mano & Mesch, 2010), the current research advances prior findings by providing a more complete picture of how and when work e-mail activity can serve as an adaptive regulatory behavioral response helping employees engage with their work on days they experience elevated workplace anxiety, modeling both adaptive and maladaptive paths.

Third, we add to the workplace anxiety literature by uncovering the dynamic experience of workplace anxiety, with 32.00 % of the variance residing within individuals on a daily basis. Implications of our findings are thus applicable to a wider subset of employees than general examinations of workplace anxiety grounded in individual differences. Importantly, our results depict employees who experience fluctuating levels of workplace anxiety day-to-day as active agents who may regulate their behaviors at work, facilitating daily performance outcomes.

Our work also carries potential downstream implications for employees. The experience of workplace anxiety has been demonstrated to exert detrimental outcomes that may impinge on employees' career adaptability (e.g., Pouyaud et al., 2012). For example, anxiety affects individuals' confidence and control, important components of career adaptability (Pouyaud et al., 2012). In turn, employers may be more likely to perceive those experiencing workplace anxiety as lower performers (cf. McCarthy & Goffin, 2004), suggestive of coping strategies that include the avoidance of, or down-regulating, anxiety (e.g., Reio & Callahan, 2004). In contrast,

our research offers a more balanced perspective to how employees may respond to daily experiences of workplace anxiety, and demonstrates a simple strategy for employees to make consequential progress on their work, on days they are anxious about work. Utilizing the experience of workplace anxiety to focus on work e-mail activity represents a constructive self-regulatory behavior that can benefit performance outcomes. This may be particularly helpful for employees who experience work-related anxiety in the course of adjusting to various career transitions such as a new company, department, team, or role. It is also useful for employees adapting to new modes of work, such as hybrid or remote work, to ensure smoother work transitions. Rather than succumbing to the experience of workplace anxiety by maladaptively disengaging from work through non-work e-mail activity, employees are encouraged to leverage work e-mail activity as an effective behavioral regulatory strategy in response to work-related anxiety.

Finally, we contribute to research demonstrating how work e-mail activity, as a regulatory behavior, can vary day-by-day—increasing or decreasing based on experienced workplace anxiety. As a regulatory behavior, we found that work e-mail activity helps enhance episodic performance outcomes when employees experience anxiety about their upcoming work tasks. Whether this strategy carries lasting or long-term effects remains to be seen, a point to which we return in suggestions for future work. The current research provides a needed progression to the workplace anxiety and e-mail literatures, both of which have developed in parallel and predominantly focused on negative outcomes.

5.2. Practical implications

From a practical standpoint, our findings are important, as directives from the American Psychiatric Association (2018) for addressing workplace anxiety emphasize the implementation of organization-wide policies and practices. While company initiatives are vital, this is suggestive of a passive approach employees take in response to workplace anxiety, leaving a gap in current knowledge as to how employees may play an active role in managing their daily work behavior to enhance performance outcomes when starting their workday experiencing workplace anxiety. Our findings uncover telepressure as a contributor of daily workplace anxiety. Managers are encouraged to provide more transparent and clear-cut guidance to protect employees' non-work time and lessen the burden employees' feel in their preoccupation with immediately responding to work communication. This is particularly salient as companies are experimenting with how to best structure work schedules as they adapt to a "new normal" post-pandemic.

Encouragingly, our findings disentangle how daily workplace anxiety can enhance performance outcomes via work e-mail activity. Although we are certainly not advocating that workplace anxiety should be induced in employees, we suggest that, on days when employees experience workplace anxiety, they may shape their workday through behavioral regulation—checking, writing, and responding to work e-mails, which enhances performance outcomes. One factor that strengthens this effect is work e-mail centrality. To that end, managers may consider underscoring how work e-mail activity is a key strategic action that may support employees' performance outcomes during anxiety-filled days, while respecting employees' non-work hours.

Given our finding that employees achieve higher facets of performance due to work e-mail activity on days they feel anxious about work, a practically relevant question is whether employees who experience workplace anxiety day-to-day should intensively focus on their work e-mails. We presume the answer to this question is more nuanced than a simple dichotomy, as our results reveal one potential path through which employees might engage with and adapt their daily behaviors to enhance work outcomes when they start the workday feeling anxious. With this finding, however, we caution managers not to over-emphasize e-mail activity at work, as e-mail overload can become a work stressor (Barley et al., 2011; Steffensen et al., 2021). We suggest that managers and employees work together to develop a more structured workflow, such as focusing on quality of e-mails over quantity (Dhawan, 2021), setting expectations to work around the bias towards urgent responding to e-mails (Giurge & Bohns, 2021), or mapping out specific situations or tasks through which e-mails should be bypassed altogether in lieu of other communication channels that facilitate in-person dialogue (Ellis, 2021).

5.3. Limitations and future directions

As with all research, we acknowledge the limitations of the current work, which represent opportunities for further research that extend knowledge on workplace anxiety. First, all our measures were self-reported, which raise potential concerns pertaining to common method variance (Podsakoff et al., 2003). Our aim was to consider the daily lived experiences of employees, particularly with reference to perceptions of telepressure and normative response pressure, as well as how employees actively manage their work when they start the day worrying about work. Accordingly, employees' self-reports are the appropriate reference point to capture their daily emotion and behaviors (Gabriel et al., 2019). Moreover, we separated our constructs through several time lags throughout the day, controlled for theoretically relevant constructs that may provide alternative explanations, along with controlling for linear and cyclical trends in the data. The presence of moderation also alleviates some concerns of common method variance. Nevertheless, we encourage additional research that utilizes other ratings of performance.

Second, while e-mail represents a core feature of many occupations as the "symbol" of communication in modern-day workplaces (Barley et al., 2011), with 4.3 billion users of e-mail worldwide (Statista, 2022), justifying our consideration of e-mail activity as a behavioral regulatory strategy, we acknowledge that our findings may not be generalizable to segments of employee populations that do not utilize e-mail as part of their daily work. It would be important for future work to consider applications to various industries that are not conducive to e-mail activity, such as the trades or manufacturing and construction industries, in terms of beneficial regulatory strategies that may help employees in these industries manage their daily work-related anxiety to improve work-related outcomes. There may also be other forms of work-related behavioral regulatory activities that can further draw out the adaptive function of daily work anxiety, including meetings and/or teleconferencing. By the same token, we considered non-work e-mail activity as a parallel

maladaptive behavioral activity to contrast with work e-mail activity. As it is important, within the work context, that employees are perceived to be working, non-work e-mail activity reflects inconspicuous or discreet activities that enable withdrawal or disengagement from work. Future work may consider other behaviors that reflect maladaptive activities, such as cyberloafing. Moreover, though we controlled for the total number of daily e-mails received, a potential limitation is that we did not distinguish between number of work vs. non-work e-mails received. Future work should continue untangling how distinct characteristics of e-mail impact the experience of, and response to, workplace anxiety.

Given the dynamic nature of workplace anxiety, we also encourage future research to continue examining: (a) additional factors that contribute to the daily experience of workplace anxiety, such as daily job demands; (b) further conditioning factors that may prolong the positive effect of workplace anxiety, such as emotional intelligence (Mayer & Salovey, 1997), coping ability, and various coping strategies (Folkman et al., 1986; Folkman & Lazarus, 1985; Lazarus & Folkman, 1984); and (c) additional outcomes that may be enhanced due to the self-regulatory behavioral efforts of anxious employees, such as citizenship behaviors directed towards the organization (Williams & Anderson, 1991). In addition, given that work e-mail centrality was found to play a critical role in enhancing the positive effects of workplace anxiety on work e-mail activity, future work should continue to explore whether work e-mail centrality buffers negative effects of workplace anxiety on various technology-based outcomes, such as work and non-work technology use (Fuglseth & Sørebø, 2014; Joo et al., 2016) and multi-communication (i.e., participating in two or more conversations using synchronous communication tools; Reinsch Jr. et al., 2008). For instance, workplace anxiety may orient employees away from multi-communicating experiences, yet media use norms such as work e-mail centrality may weaken this negative relationship (cf. Barry & Fulmer, 2004; Reinsch Jr. et al., 2008).

Third, while our research identified work e-mail activity as a work-relevant regulatory behavior by which employees may enhance performance outcomes on days they are anxious about work, given literature on work e-mail suggesting that e-mail overload is a significant source of stress (e.g., Barley et al., 2011; Steffensen et al., 2021), we are unable to speak to whether there is a threshold effect, such that there may be a certain point after which e-mail may become onerous or unsurmountable and employees experiencing work anxiety may pivot their regulatory behaviors from engagement to disengagement. To that point, as a post-hoc analysis, we tested the curvilinear effects of workplace anxiety on work e-mail activity and on non-work e-mail activity, positing an inverted-U shaped relationship between workplace anxiety and work e-mail activity and a U-shaped relationship between workplace anxiety and non-work e-mail activity. We added a squared term of workplace anxiety to the full model in the main study and regressed work and non-work e-mail activity on the squared term. Results indicated that the squared term of workplace anxiety was not significantly related to either work e-mail activity ($\gamma = -0.02, p = .749$) or non-work e-mail activity ($\gamma = -0.01, p = .875$). Nonetheless, it would be important for future research to delve more deeply into the bounds of these effects.

Relatedly, research has demonstrated that work e-mail is associated with increased stress and lower efficiency, leading to several calls for the reduction of e-mail burden (Gallo, 2012; Newport, 2016; Plummer, 2019). Although the current research focused on how and when work e-mail activity may reflect a regulatory behavior that enables anxious employees to connect with their work and enhance performance outcomes, further research should also consider bounds of our model such that, for certain individuals (e.g., workaholics, perfectionists) or certain situations (e.g., high-stress periods, toxic work environments, abusive supervision), telepressure, normative response pressure, workplace anxiety, and e-mail activity would bring about negative outcomes. It would also be advantageous, given new modes of work with varying degrees of flexibility in schedule and location, to examine how various work modes facilitate, or perhaps unintentionally aggravate, responses to workplace anxiety. Future research should also consider whether there are associated longer-term costs, for instance, on physical and psychological wellbeing outcomes. In combination with further research on threshold effects, this may provide a more extensive portrayal of how work e-mail activity unfolds its effects on employees when they experience workplace anxiety. It would also be important for future work to investigate further downstream implications of workplace anxiety, particularly on career development. Given the relevance of our findings to new modes of work, it would be fruitful for future research to explicitly consider how employees may adaptively use their experience of workplace anxiety in various contexts surrounding work adjustments (e.g., navigating remote or hybrid work, work shifts) and career transitions (e.g., selection and promotion contexts) through technology-based self-regulatory behaviors that generate constructive outcomes such as enhanced daily role transitions among work, home, and remote locations (Ashforth et al., 2000) and increased interpersonal influence in organizations (Barry & Fulmer, 2004). Ultimately, it is hoped that this research sparks further programs of work uncovering the adaptive functions of day-to-day workplace anxiety for employees.

CRediT authorship contribution statement

Bonnie Hayden Cheng: Conceptualization, Methodology, Data curation, Writing – original draft. **Yaxian Zhou:** Data curation, Formal analysis, Writing – review & editing. **Fangyuan Chen:** Conceptualization, Methodology, Writing – review & editing.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

References

Addas, S., & Pinsonneault, A. (2018). E-mail interruptions and individual performance: Is there a silver lining? *MIS Quarterly, 42*(2), 381–406. https://doi.org/10.25300/MISQ/2018/13157

American Psychiatric Association. (2018). Workplace stress. https://workplacementalhealth.org/mental-health-topics/workplace-stress.

Andel, S. A., Arvan, M. L., & Shen, W. (2021). Work as replenishment or responsibility? Moderating effects of occupational calling on the within-person relationship between COVID-19 news consumption and work engagement. *Journal of Applied Psychology, 106*(7), 965–974. https://doi.org/10.1037/apl0000934

Ashforth, B. E., Kreiner, G. E., & Fugate, M. (2000). All in a day's work: Boundaries and micro role transitions. *Academy of Management Review, 25*(3), 472–491. https://doi.org/10.5465/amr.2000.3363315

Barber, L. K., & Santuzzi, A. M. (2015). Please respond ASAP: Workplace telepressure and employee recovery. *Journal of Occupational Health Psychology, 20*(2), 172–189. https://doi.org/10.1037/a0038278

Barclay, L. J., & Kiefer, T. (2019). In the aftermath of unfair events: Understanding the differential effects of anxiety and anger. *Journal of Management, 45*(5), 1802–1829. https://doi.org/10.1177/0149206317739107

Barley, S. R., Meyerson, D. E., & Grodal, S. (2011). E-mail as a source and symbol of stress. *Organization Science, 22*(4), 887–906. https://doi.org/10.1287/orsc.1100.0573

Barlow, D. H. (2004). *Anxiety and its disorders: The nature and treatment of anxiety and panic*. Guilford Press.

Barry, B., & Fulmer, I. S. (2004). The medium and the message: The adaptive use of communication media in dyadic influence. *Academy of Management Review, 29*(2), 272–292. https://doi.org/10.5465/amr.2004.12736093

Beal, D. J., & Weiss, H. M. (2003). Methods of ecological momentary assessment in organizational research. *Organizational Research Methods, 6*(4), 440–464. https://doi.org/10.1177/1094428103257361

Bellotti, V., Ducheneaut, N., Howard, M., & Smith, I. (2003). Taking email to task: The design and evaluation of a task management centered email tool. In *Proceedings of the SIGCHI conference on human factors in computing systems, Ft. Lauderdale, Florida, USA*. https://doi.org/10.1145/642611.642672

Bolino, M. C., Harvey, J., & Bachrach, D. G. (2012). A self-regulation approach to understanding citizenship behavior in organizations. *Organizational Behavior and Human Decision Processes, 119*(1), 126–139. https://doi.org/10.1016/j.obhdp.2012.05.006

Borkovec, T. D., Alcaine, O. M., & Behar, E. (2004). Avoidance theory of worry and generalized anxiety disorder. In *Generalized anxiety disorder: Advances in research and practice* (pp. 77–108). The Guilford Press.

Bourdeau, S., Ollier-Malaterre, A., & Houlfort, N. (2019). Not all work-life policies are created equal: Career consequences of using enabling versus enclosing work-life policies. *Academy of Management Review, 44*(1), 172–193. https://doi.org/10.5465/amr.2016.0429

Brooks, A. W., & Schweitzer, M. E. (2011). Can nervous Nelly negotiate? How anxiety causes negotiators to make low first offers, exit early, and earn less profit. *Organizational Behavior and Human Decision Processes, 115*(1), 43–54. https://doi.org/10.1016/j.obhdp.2011.01.008

Brown, R., Duck, J., & Jimmieson, N. (2014). E-mail in the workplace: The role of stress appraisals and normative response pressure in the relationship between e-mail stressors and employee strain. *International Journal of Stress Management, 21*(4), 325–347. https://doi.org/10.1037/a0037464

Caron, C. (2022, January 19). *The upside of anxiety*. The New York Times. https://www.nytimes.com/2022/01/19/well/mind/anxiety-benefits.html.

Carver, C. S., & Scheier, M. F. (1988). A control-process perspective on anxiety. *Anxiety Research, 1*(1), 17–22. https://doi.org/10.1080/10615808808248217

Chawla, N., & Gabriel, A. S. (2022). From crude jokes to diminutive terms: Exploring experiences of hostile and benevolent sexism during job search. *Personnel Psychology*. https://doi.org/10.1111/peps.12569

Chawla, N., MacGowan, R. L., Gabriel, A. S., & Podsakoff, N. P. (2020). Unplugging or staying connected? Examining the nature, antecedents, and consequences of profiles of daily recovery experiences. *Journal of Applied Psychology, 105*(1), 19–39. https://doi.org/10.1037/apl0000423

Chen, H., Wang, L., & Bao, J. (2022). Why does leader aggressive humor lead to bystander workplace withdrawal behavior?-Based on the dual path perspective of cognition- affection. *Frontiers in Psychology, 13*, Article 925029. https://doi.org/10.3389/fpsyg.2022.925029

Cheng, B. H., & McCarthy, J. M. (2018). Understanding the dark and bright sides of anxiety: A theory of workplace anxiety. *Journal of Applied Psychology, 103*(5), 537–560. https://doi.org/10.1037/apl0000266

Dabbish, L. A., & Kraut, R. E. (2006). Email overload at work: An analysis of factors associated with email strain. In *Proceedings of the 2006 20th anniversary conference on computer supported cooperative work* (pp. 431–440). https://doi.org/10.1145/1180875.1180941

Dabbish, L. A., Kraut, R. E., Fussell, S., & Kiesler, S. (2005). *Understanding email use: Predicting action on a message proceedings of the SIGCHI conference on human factors in computing systems, Portland, Oregon, USA*. https://doi.org/10.1145/1054972.1055068

Dhawan, E. (2021, February 19). Slow down and write better emails. *Harvard Business Review*. https://hbr.org/2021/02/slow-down-and-write-better-emails.

Ellis, C. D. (2021). Stop. Does that message really need to be an email? *Harvard Business Review*. , March 30 https://hbr.org/2021/03/stop-does-that-message-really-need-to-be-an-email. , March 30.

Finn, J. (2006). An exploratory study of email use by direct service social workers. *Journal of Technology in Human Services, 24*(4), 1–20. https://doi.org/10.1300/J017v24n04_01

Folkman, S., & Lazarus, R. S. (1985). If it changes it must be a process: Study of emotion and coping during three stages of a college examination. *Journal of Personality and Social Psychology, 48*(1), 150–170. https://doi.org/10.1037/0022-3514.48.1.150

Folkman, S., Lazarus, R. S., Dunkel-Schetter, C., DeLongis, A., & Gruen, R. J. (1986). Dynamics of a stressful encounter: Cognitive appraisal, coping, and encounter outcomes. *Journal of Personality and Social Psychology, 50*(5), 992–1003. https://doi.org/10.1037/0022-3514.50.5.992

Ford, M. T., Cerasoli, C. P., Higgins, J. A., & Decesare, A. L. (2011). Relationships between psychological, physical, and behavioural health and work performance: A review and meta-analysis. *Work and Stress, 25*(3), 185–204. https://doi.org/10.1080/02678373.2011.609035

Frese, M., Fay, D., Hilburger, T., Leng, K., & Tag, A. (1997). The concept of personal initiative: Operationalization, reliability and validity in two German samples. *Journal of Occupational and Organizational Psychology, 70*(2), 139–161. https://doi.org/10.1111/j.2044-8325.1997.tb00639.x

Frese, M., Kring, W., Soose, A., & Zempel, J. (1996). Personal initiative at work: Differences between East and West Germany. *Academy of Management Journal, 39*(1), 37–63. https://doi.org/10.5465/256630

Frijda, N. H., Kuipers, P., & ter Schure, E. (1989). Relations among emotion, appraisal, and emotional action readiness. *Journal of Personality and Social Psychology, 57*(2), 212–228. https://doi.org/10.1037/0022-3514.57.2.212

Fuglseth, A. M., & Sørebø, Ø. (2014). The effects of technostress within the context of employee use of ICT. *Computers in Human Behavior, 40*, 161–170. https://doi.org/10.1016/j.chb.2014.07.040

Gabriel, A. S., Lanaj, K., & Jennings, R. E. (2021a). Is one the loneliest number? A within-person examination of the adaptive and maladaptive consequences of leader loneliness at work. *Journal of Applied Psychology, 106*(10), 1517–1538. https://doi.org/10.1037/apl0000838

Gabriel, A. S., MacGowan, R. L., Ganster, M. L., & Slaughter, J. E. (2021b). The influence of COVID-induced job search anxiety and conspiracy beliefs on job search effort: A within-person investigation. *Journal of Applied Psychology, 106*(5), 657–673. https://doi.org/10.1037/apl0000926

Gabriel, A. S., Podsakoff, N. P., Beal, D. J., Scott, B. A., Sonnentag, S., Trougakos, J. P., & Butts, M. M. (2019). Experience sampling methods: A discussion of critical trends and considerations for scholarly advancement. *Organizational Research Methods, 22*(4), 969–1006. https://doi.org/10.1177/1094428118802626

Gallo, A. (2012, February 21). Stop email overload. *Harvard Business Review*. https://hbr.org/2012/02/stop-email-overload-1.

Giurge, L. M., & Bohns, V. K. (2021). You don't need to answer right away! Receivers overestimate how quickly senders expect responses to non-urgent work emails. *Organizational Behavior and Human Decision Processes, 167*, 114–128. https://doi.org/10.1016/j.obhdp.2021.08.002

Guarana, C. L., Barnes, C. M., & Ong, W. J. (2021). The effects of blue-light filtration on sleep and work outcomes. *Journal of Applied Psychology, 106*(5), 784–796. https://doi.org/10.1037/apl0000806

Haider, S., Fatima, N., & de Pablos-Heredero, C. (2020). A three-wave longitudinal study of moderated mediation between perceptions of politics and employee turnover intentions: The role of job anxiety and political skills. *Journal of Work and Organizational Psychology, 36*, 1–14. https://doi.org/10.5093/jwop2020a1

Hillebrandt, A., & Barclay, L. J. (2022). How COVID-19 can promote workplace cheating behavior via employee anxiety and self-interest – And how prosocial messages may overcome this effect. *Journal of Organizational Behavior, 43*(5), 858–877. https://doi.org/10.1002/job.2612
Hillebrandt, A., Saldanha, M. F., Brady, D. L., & Barclay, L. J. (2022). Delivering bad news fairly: The influence of core self-evaluations and anxiety for the enactment of interpersonal justice. *Human Relations, 75*(7), 1238–1269. https://doi.org/10.1177/00187267211011000
Hofmann, D. A., & Gavin, M. B. (1998). Centering decisions in hierarchical linear models: Implications for research in organizations. *Journal of Management, 24*(5), 623–641. https://doi.org/10.1177/014920639802400504
Hu, J., He, W., & Zhou, K. (2020). The mind, the heart, and the leader in times of crisis: How and when COVID-19-triggered mortality salience relates to state anxiety, job engagement, and prosocial behavior. *Journal of Applied Psychology, 105*(11), 1218–1233. https://doi.org/10.1037/apl0000620
Huang, J., Guo, G., Tang, D., Liu, T., & Tan, L. (2019). An eye for an eye? Third parties' silence reactions to peer abusive supervision: The mediating role of workplace anxiety, and the moderating role of core self-evaluation. *International Journal of Environmental Research and Public Health, 16*(24), 5027. https://doi.org/10.3390/ijerph16245027
Izard, C., & Youngstrom, E. (1996). The activation and regulation of fear and anxiety. In B. Brown (Ed.), *Vol. 43. Perspectives on anxiety, panic, and fear* (pp. 1–57). Lincoln: University of Nebraska Press.
Izard, C. E. (2013). *Patterns of emotions: A new analysis of anxiety and depression*. Academic Press.
Jackson, T., Dawson, R., & Wilson, D. (2001). The cost of email interruption. *Journal of Systems and Information Technology, 5*(1), 81–92. https://doi.org/10.1108/13287260180000760
Jackson, T., Dawson, R., & Wilson, D. (2003). Reducing the effect of email interruptions on employees. *International Journal of Information Management, 23*(1), 55–65. https://doi.org/10.1016/S0268-4012(02)00068-3
Jerejian, A. C. M., Reid, C., & Rees, C. S. (2013). The contribution of email volume, email management strategies and propensity to worry in predicting email stress among academics. *Computers in Human Behavior, 29*(3), 991–996. https://doi.org/10.1016/j.chb.2012.12.037
Joo, Y. J., Lim, K. Y., & Kim, N. H. (2016). The effects of secondary teachers' technostress on the intention to use technology in South Korea. *Computers & Education, 95*, 114–122. https://doi.org/10.1016/j.compedu.2015.12.004
Kanfer, R., Frese, M., & Johnson, R. E. (2017). Motivation related to work: A century of progress. *Journal of Applied Psychology, 102*(3), 338–355. https://doi.org/10.1037/apl0000133
Kapadia, C., & Melwani, S. (2021). More tasks, more ideas: The positive spillover effects of multitasking on subsequent creativity. *Journal of Applied Psychology, 106*(4), 542–559. https://doi.org/10.1037/apl0000506
Kleine, D. (1990). Anxiety and sport performance: A meta-analysis. *Anxiety Research, 2*(2), 113–131. https://doi.org/10.1080/08917779008249330
Kouchaki, M., & Desai, S. D. (2015). Anxious, threatened, and also unethical: How anxiety makes individuals feel threatened and commit unethical acts. *Journal of Applied Psychology, 100*(2), 360–375. https://doi.org/10.1037/a0037796
Kushlev, K., & Dunn, E. W. (2015). Checking email less frequently reduces stress. *Computers in Human Behavior, 43*, 220–228. https://doi.org/10.1016/j.chb.2014.11.005
Lanaj, K., Foulk, T. A., & Erez, A. (2019). Energizing leaders via self-reflection: A within-person field experiment. *Journal of Applied Psychology, 104*(1), 1–18. https://doi.org/10.1037/apl0000350
Lazarus, R. S. (1991). *Emotion and adaptation*. Oxford University Press.
Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. New York: Springer.
Lee, K., Kim, E., Bhave, D. P., & Duffy, M. K. (2016). Why victims of undermining at work become perpetrators of undermining: An integrative model. *Journal of Applied Psychology, 101*(6), 915–924. https://doi.org/10.1037/apl0000092
Leroy, S. (2009). Why is it so hard to do my work? The challenge of attention residue when switching between work tasks. *Organizational Behavior and Human Decision Processes, 109*(2), 168–181. https://doi.org/10.1016/j.obhdp.2009.04.002
Lin, C.-J., Pauleen, D., & Li, C.-R. (2022). Perceived abusive leadership, narcissistic personality, and employee's political behaviors: A moderated-mediation model. *Journal of Leadership and Organizational Studies, 29*(4), 409–423. https://doi.org/10.1177/15480518211041632
Lin, S.-H., Chang, C.-H., Lee, H. W., & Johnson, R. E. (2020). Positive family events facilitate effective leader behaviors at work: A within-individual investigation of family-work enrichment. *Journal of Applied Psychology, 106*(9), 1412–1434. https://doi.org/10.1037/apl0000827
Lund, S., Madgavkar, A., Manyika, J., Smit, S., Ellingrud, K., Meaney, M., & Robinson, O. (2021, February 18). The future of work after COVID-19. McKinsey https://www.mckinsey.com/featured-insights/future-of-work/the-future-of-work-after-covid-19.
Mano, R. S., & Mesch, G. S. (2010). E-mail characteristics, work performance and distress. *Computers in Human Behavior, 26*(1), 61–69. https://doi.org/10.1016/j.chb.2009.08.005
Marks, I. M., & Nesse, R. M. (1994). Fear and fitness: An evolutionary analysis of anxiety disorders. *Ethology and Sociobiology, 15*, 247–261. https://doi.org/10.1016/0162-3095(94)90002-7
Markus, M. L. (1994). Electronic mail as the medium of managerial choice. *Organization Science, 5*(4), 502–527. https://doi.org/10.1287/orsc.5.4.502
Maruping, L. M., & Agarwal, R. (2004). Managing team interpersonal processes through technology: A task-technology fit perspective. *Journal of Applied Psychology, 89*(6), 975–990. https://doi.org/10.1037/0021-9010.89.6.975
Mathews, R., Grant, E., & Littlefield, L. (2003). E-mail communication survey: A National Psychology Week initiative. *InPsych: The Bulletin of the Australian Psychological Society, 25*, 13–16.
Mayer, J. D., & Salovey, P. (1997). What is emotional intelligence. In P. Salovey, & D. Sluyter (Eds.), *Emotional development and emotional intelligence: Implications for educators* (pp. 3–31). Basic Books.
McCarthy, J., & Goffin, R. (2004). Measuring job interview anxiety: Beyond weak knees and sweaty palms. *Personnel Psychology, 57*(3), 607–637. https://doi.org/10.1111/j.1744-6570.2004.00002.x
McCarthy, J., Hrabluik, C., & Jelley, R. B. (2009). Progression through the ranks: Assessing employee reactions to high-stakes employment testing. *Personnel Psychology, 62*(4), 793–832. https://doi.org/10.1111/j.1744-6570.2009.01158.x
McCarthy, J. M., Trougakos, J. P., & Cheng, B. H. (2016). Are anxious workers less productive workers? It depends on the quality of social exchange. *Journal of Applied Psychology, 101*(2), 279–291. https://doi.org/10.1037/apl0000044
McCarthy, J. M., Truxillo, D. M., Bauer, T. N., Erdogan, B., Shao, Y., Wang, M., … Gardner, C. (2021). Distressed and distracted by COVID-19 during high-stakes virtual interviews: The role of job interview anxiety on performance and reactions. *Journal of Applied Psychology, 106*, 1103–1117. https://doi.org/10.1037/apl0000943
McEwen, B. S., Eiland, L., Hunter, R. G., & Miller, M. M. (2012). Stress and anxiety: Structural plasticity and epigenetic regulation as a consequence of stress. *Neuropharmacology, 62*(1), 3–12. https://doi.org/10.1016/j.neuropharm.2011.07.014
Muraven, M., & Baumeister, R. F. (2000). Self-regulation and depletion of limited resources: Does self-control resemble a muscle? *Psychological Bulletin, 126*(2), 247–259. https://doi.org/10.1037/0033-2909.126.2.247
Muthén, L., & Muthén, B. (1998–2021). *Mplus user's guide* (8th ed.). Muthén & Muthén.
Neal, A., Ballard, T., & Vancouver, J. B. (2017). Dynamic self-regulation and multiple-goal pursuit. *Annual Review of Organizational Psychology and Organizational Behavior, 4*(1), 401–423. https://doi.org/10.1146/annurev-orgpsych-032516-113156
Newport, C. (2016). A modest proposal: Eliminate email. *Harvard Business Review*. February 18 https://hbr.org/2016/02/a-modest-proposal-eliminate-email.
Organ, D. W. (1988). *Organizational citizenship behavior: The good soldier syndrome*. Lexington Books.
Plummer, M. (2019). How to spend way less time on email every day. *Harvard Business Review*. January 22 https://hbr.org/2019/01/how-to-spend-way-less-time-on-email-every-day. January 22.
Podsakoff, N. P., Spoelma, T. M., Chawla, N., & Gabriel, A. S. (2019). What predicts within-person variance in applied psychology constructs? An empirical examination. *Journal of Applied Psychology, 104*(6), 727–754. https://doi.org/10.1037/apl0000374

Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology, 88*(5), 879–903. https://doi.org/10.1037/0021-9010.88.5.879

Pouyaud, J., Vignoli, E., Dosnon, O., & Lallemand, N. (2012). Career adapt-abilities scale-France form: Psychometric properties and relationships to anxiety and motivation. *Journal of Vocational Behavior, 80*(3), 692–697. https://doi.org/10.1016/j.jvb.2012.01.021

Preacher, K. J., Zyphur, M. J., & Zhang, Z. (2010). A general multilevel SEM framework for assessing multilevel mediation. *Psychological Methods, 15*(3), 209–233. https://doi.org/10.1037/a0020141

Ragu-Nathan, T. S., Tarafdar, M., Ragu-Nathan, B. S., & Tu, Q. (2008). The consequences of technostress for end users in organizations: Conceptual development and empirical validation. *Information Systems Research, 19*(4), 417–433. https://doi.org/10.1287/isre.1070.0165

Raudenbush, S. W., & Bryk, A. S. (2002). *Hierarchical linear models: Applications and data analysis methods*. Sage Publications.

Reinsch, N. L., Jr., Turner, J. W., & Tinsley, C. H. (2008). Multicommunicating: A practice whose time has come? *Academy of Management Review, 33*(2), 391–403. https://doi.org/10.5465/amr.2008.31193450

Reio, T. G., & Callahan, J. L. (2004). Affect, curiosity, and socialization-related learning: A path analysis of antecedents to job performance. *Journal of Business and Psychology, 19*(1), 3–22. https://doi.org/10.1023/B:JOBU.0000040269.72795.ce

Rogers Behavioral Health. (2021). Workplace anxiety during a pandemic. https://rogersbh.org/resources/workplace-anxiety-during-pandemic.

Rosen, C. C., Dimotakis, N., Cole, M. S., Taylor, S. G., Simon, L. S., Smith, T. A., & Reina, C. S. (2020). When challenges hinder: An investigation of when and how challenge stressors impact employee outcomes. *Journal of Applied Psychology, 105*, 1181–1206. https://doi.org/10.1037/apl0000483

Rosen, C. C., Simon, L. S., Gajendran, R. S., Johnson, R. E., Lee, H. W., & Lin, S.-H. (2019). Boxed in by your inbox: Implications of daily e-mail demands for managers' leadership behaviors. *Journal of Applied Psychology, 104*(1), 19–33. https://doi.org/10.1037/apl0000343

Russell, E., & Woods, S. A. (2020). Personality differences as predictors of action-goal relationships in work-email activity. *Computers in Human Behavior, 103*, 67–79. https://doi.org/10.1016/j.chb.2019.09.022

Scott, B. A., & Barnes, C. M. (2011). A multilevel field investigation of emotional labor, affect, work withdrawal, and gender. *Academy of Management Journal, 54*(1), 116–136. https://doi.org/10.5465/amj.2011.59215086

Seipp, B. (1991). Anxiety and academic performance: A meta-analysis of findings. *Anxiety Research, 4*(1), 27–41. https://doi.org/10.1080/08917779108248762

Selig, J. P., & Preacher, K. J. (2008). Monte Carlo method for assessing mediation: An interactive tool for creating confidence intervals for indirect effects [Computer software]. http://quantpsy.org.

Singer, J. D., & Willett, J. B. (2003). *Applied longitudinal data analysis: Modeling change and event occurrence*. Oxford University Press.

Smith, C. A., & Ellsworth, P. C. (1985). Patterns of cognitive appraisal in emotion. *Journal of Personality and Social Psychology, 48*(4), 813–838. https://doi.org/10.1037/0022-3514.48.4.813

Sonnentag, S., Volmer, J., & Spychala, A. (2008). Job performance. In *, 1. The Sage handbook of organizational behavior* (pp. 427–447).

Statista. (2022). Number of e-mail users worldwide from 2017 to 2025. https://www.statista.com/statistics/255080/number-of-e-mail-users-worldwide/.

Steffensen, D. S., McAllister, C. P., Perrewé, P. L., Wang, G., & Brooks, C. D. (2021). "You've got mail": A daily investigation of email demands on job tension and work-family conflict. *Journal of Business and Psychology, 1-14*. https://doi.org/10.1007/s10869-021-09748-1

Trougakos, J. P., Beal, D. J., Cheng, B. H., Hideg, I., & Zweig, D. (2015). Too drained to help: A resource depletion perspective on daily interpersonal citizenship behaviors. *Journal of Applied Psychology, 100*(1), 227–236. https://doi.org/10.1037/a0038082

Vohs, K. D., Baumeister, R. F., & Ciarocco, N. J. (2005). Self-regulation and self-presentation: Regulatory resource depletion impairs impression management and effortful self-presentation depletes regulatory resources. *Journal of Personality and Social Psychology, 88*(4), 632–657. https://doi.org/10.1037/0022-3514.88.4.632

Wanberg, C. R., Zhu, J., & Van Hooft, E. A. (2010). The job search grind: Perceived progress, self-reactions, and self-regulation of search effort. *Academy of Management Journal, 53*(4), 788–807. https://doi.org/10.5465/amj.2010.52814599

Whittaker, S., & Sidner, C. (1996). Email overload: Exploring personal information management of email. In *Proceedings of the SIGCHI conference on Human factors in computing systems* (pp. 276–283).

Williams, A. (2017). Prozac nation is now the United States of Xanax. New York Times. June 10 https://www.nytimes.com/2017/06/10/style/anxiety-is-the-new-depression-xanax.html.

Williams, L. J., & Anderson, S. E. (1991). Job satisfaction and organizational commitment as predictors of organizational citizenship and in-role behaviors. *Journal of Management, 17*(3), 601–617. https://doi.org/10.1177/014920639101700305

Wilton, P. C., & Myers, J. G. (1986). Task, expectancy, and information assessment effects in information utilization processes. *Journal of Consumer Research, 12*(4), 469–486. https://doi.org/10.1086/208531

World Health Organization. (2022, September 28). Mental health at work. https://www.who.int/news-room/fact-sheets/detail/mental-health-at-work.

Xi, M., He, W., Fehr, R., & Zhao, S. (2022). Feeling anxious and abusing low performers: A multilevel model of high performance work systems and abusive supervision. *Journal of Organizational Behavior, 43*(1), 91–111. https://doi.org/10.1002/job.2558

Zhang, W., Yan, Z., Wang, B., Qu, Y., & Qian, J. (2022). Perceived overqualification and job crafting: The mediating role of workplace anxiety and moderating role of reappraisal. *SAGE Open, 12*(2). https://doi.org/10.1177/21582440221103522

Zhang, Z., Zyphur, M. J., & Preacher, K. J. (2009). Testing multilevel mediation using hierarchical linear models: Problems and solutions. *Organizational Research Methods, 12*(4), 695–719. https://doi.org/10.1177/1094428108327450